

**DEVELOPING A MODEL OF
OCCUPATIONAL THERAPY PRACTICE
FOR CHILDREN WITH
ATTENTION DEFICIT HYPERACTIVITY DISORDER
(ADHD)**

A thesis submitted for the degree of Doctor of Philosophy

by

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February 2005

ABSTRACT

This three-stage study led to the development of a delineation model of occupational therapy practice for children with Attention Deficit Hyperactivity Disorder (ADHD). Stage one explored the current practice of occupational therapy in the United Kingdom (UK) by conducting a national survey of 282 paediatric occupational therapists. Results indicated that there were only a small number of occupational therapists (8.5%) working in a designated service for children with ADHD. This result suggested that occupational therapy for children with ADHD is a small field of practice.

Stage two involved the consensus development on the role of occupational therapy for children with ADHD. Seventy-two paediatric occupational therapists participated in the study. The therapists' top six priorities of assessment and five priorities of intervention were identified. An occupational therapy delineation model of practice was developed by integrating data generated from this research, information from the literature review, and the author's clinical experience. In order to apply the model to clinical practice, a family-centred occupational therapy care package was developed.

The third stage evaluated the process and outcome of the devised care package by conducting a multi-centred efficacy study. Twenty occupational therapists from the four countries in the UK attended a 3-day course to learn to implement the care package. Following their training, they submitted data on a sample of 20 children with ADHD. The majority of these children (85%) showed improvement in their behavioural patterns after the implementation of the care package. Over half of the cases (65%) had statistically significant changes of scores in the ADHD Rating Scales. Parents also reported experiencing good family-centred care delivered by the research therapists. The whole study makes a significant contribution to occupational therapy knowledge by creating a new delineation model of practice for which the research undertaken offers some validation.

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ACKNOWLEDGEMENTS

The author would like to thank Dr. Frances Reynolds, Senior Lecturer, Department of Health Sciences and Social Care, Brunel University for providing supervision, support and guidance in the design and data analysis of different research studies.

Acknowledgements are made to:-

1. The College of Occupational Therapists for awarding the Byers Memorial Fund and also the Hospital Saving Association for awarding the PhD Scholarship Award 2001 for the author's PhD study.
2. The National Association of Paediatric Occupational Therapists for circulating the information for the National Survey and also the ADHD Forum to all memberships throughout the country.
3. Occupational therapists who contributed to the National Survey.
4. Occupational therapists who attended the three ADHD Fora for Consensus Development in London and Edinburgh.
5. Occupational therapists who participated in the Multi-Centred Outcome Study.
6. Children, families and teachers who participated in the Multi-Centred Outcome Study.

Chapter One

Background to the Process of Inquiry

“All professional clinicians should be responsible for making some contribution to the scientific validation of their practice. That means research – the discovery and validation of the concepts and principles on which practice is based. The research mentality (and it is as much a state of mind as a process) should be an everyday working tool of the practitioner. Research is not the esoteric enterprise of people in ivory towers, nor is it the exclusive domain of people in laboratories isolated from everyday life. It is an attitude and a process used by professional people to increase practical knowledge and clinical skills.”

(Payton, 1994, p.8)

INTRODUCTION

Stephen is a 6-year old boy who was excluded by a school because of a series of events involving disruptive, aggressive and non-compliant behaviours. He is described as having poor self-control. He is always 'on the go' or often acts as if 'driven by a motor'. He often interrupts or intrudes on others' activities. He has a great problem staying seated and following basic school rules. One day in school, his teacher requested him to stay seated after working on a writing task for about five minutes. Stephen could not follow the instruction. He was asked by the teacher to stand outside the classroom. He got so agitated that he threw a pencil case at his teacher. The school excluded him and refused to have him back. He was transferred to another school but was excluded again after two months. He started a third school where the Special Needs Coordinator (SENCO) suspected that he had Attention Deficit Hyperactivity Disorder (ADHD). His General Practitioner referred him to the local Child and Adolescent Mental Health Service (CAMHS). After several assessment sessions, he was diagnosed as having ADHD of the predominantly hyperactive-impulsive type. Management strategies were provided for his parents and school staff by his occupational therapist. He also received individual support from a Learning Support Assistant (LSA) by means of a statement of special educational need.

The category of ADHD originated in the USA. It is the most common neuropsychiatric disorder in childhood. In the United Kingdom (UK), there are many children like Stephen who have been misunderstood and are struggling in both home and school environments. It is estimated that 5% of the general childhood population in the UK have ADHD (National Institute for Clinical Excellence, 2000). Therefore, it is important for clinicians to have an up-to-date knowledge of the condition and evidence-based evaluation and intervention procedures when supporting this group of children.

In the UK there has been a substantial increase in clinical activity related to children with ADHD in different child and adolescent mental health services. A 10-year follow-up study of 6- and 7-year old boys in a London community survey found that hyperactive behaviour was a strong risk factor for later psychiatric

diagnosis, antisocial behaviour, and social and peer problems (Taylor, Chadwick, Heptanstill and Dankaerts, 1996). This follow-up study provides a strong argument for the early recognition and treatment of ADHD in childhood. With better awareness and understanding of this condition, hopefully children with ADHD can be identified earlier and provided with appropriate support and treatment.

PERSONAL COMMITMENT TO SERVICES FOR FAMILIES AND CHILDREN WITH ADHD

My personal involvement with children with ADHD started around 1989 when I first worked with a child referred for hyperactivity and poor motor coordination. At that time the term ADHD had not been created. There was also limited understanding of the condition and also limited knowledge about effective treatment methods. I was not effective in helping this child in developing self-control for his hyperactivity. This experience impelled me to explore the condition further and to develop effective evaluation and intervention procedures.

In my Masters degree research conducted in 1995, I used the Sensory Integration and Praxis Tests (SIPT) and the Conners' Parent Rating Scales - 93 (CPRS-93) to evaluate the incidence of sensory integrative dysfunction and specific behavioural patterns in mainstream school children referred to the Ealing Paediatric Occupational Therapy Service. Results indicated that children referred to the service had significantly lower scores in the SIPT than the control group of normal children. About 84% of this group of children has a significant hyperactivity index in the CPRS-93 (Chu, 1996). Some of these children also received service from the local CAMHS. I started the communication and collaboration by developing an integrated service through regular weekly input with members of the CAMHS in 1997. After seven years of continuous development, occupational therapy is now an established essential component of diagnostic and therapeutic inputs for families and children with ADHD within the CAMHS.

Through direct input to children with ADHD, I have acquired a lot of clinical experience in assessment and treatment procedures. But I am frustrated by the lack

of clinical guidelines and research evidence to support some of my work. As a practitioner in the field, I believe healthcare professionals are responsible for developing the basic science and applied body of knowledge upon which our practice is based and for using that knowledge in such a way as to directly benefit our clients. Second, healthcare professions are responsible for assisting people through the use of applied knowledge that is derived from the most valid theoretical information and research evidence currently available. Armed with these commitments, I started my PhD study to develop a model of evidence-based, family-centred, occupational therapy practice for children with ADHD in July 2000. A good model of practice presents and organises a number of theoretical concepts drawn from research evidence and clinical experience, gives clear guidelines about what to assess and how to assess it, and states the goals of intervention (Kielhofner, 1992). It is established through different processes of scientific inquiry.

THE ROLE OF OCCUPATIONAL THERAPY FOR CHILDREN WITH ADHD: JUSTIFICATION AND POTENTIAL CONTRIBUTION

As an applied healthcare discipline, occupational therapy focuses on assisting individuals with different disability conditions to engage in daily life activities that they find meaningful and purposeful (American Occupational Therapy Association, 2002). The broad term that occupational therapists use to describe the breadth and meaning of these “everyday life activities” is “occupation”. In this section, concepts of the science of occupation and their application in occupational therapy practice for children with ADHD will be discussed in order to justify the unique role and potential contributions, which could be made by paediatric occupational therapists. Information presented will serve as an overarching orientation for the whole study.

Occupation for Health and Occupational Science

Occupation is a complex multi-dimensional phenomenon. Occupations are defined as “chunks” or “units” of human activity that are purposeful, self-directed, and meaningful to the person who performs them (University of Southern

California, 1987, cited in Yerxa, Clark, Jackson, Pierce, and Zemke, 1989). Hinojosa and Kramer (1997) described occupations as the ordinary and familiar things that people engage in throughout their daily lives to occupy their time and give life meaning, which always have some degree of personal meaning, having contextual, temporal, psychological, social, symbolic, cultural, ethnic, and / or spiritual dimensions.

Gray (1997) emphasises the essence of occupation is that it is goal directed, meaningful, repeatable and is perceived as “doing” by those engaged in it. Wilcock (1998, p.341) reinforces that occupation “is a synthesis of doing, being and becoming which is engaged in not only by individuals but also at community, national and international levels for cultural, social and political purposes. It is the outcomes of such group occupation which have long-term, but often unforeseen, effects upon the health of individuals”. Fisher (1998) describes occupation as a noun of actions that enables persons to do and to accomplish. Christiansen (1999) uses the concept of occupation as the key to identity, goal setting, and motivation.

Participation or involvement in the everyday occupations of life is seen as essential for health and human development (Law, Steinwender & Leclair, 1998). Through participation, individuals acquire skills, connect with others and the larger community, and also discover purpose and meaning in life. This leads to life satisfaction and a sense of competence (Law, 2002). In order to highlight the concept of ‘occupation for health’, Zemke (2004, p.618) suggests that “we can think of health as existing when people’s resources enable them to achieve valued goals through meaningful occupational patterns of participation in their communities”. The study of occupation as a science provides occupational therapists with the conceptual foundation for what to do and how occupation could be used to facilitate a better quality of life for their clients.

Occupational science originated as a basic social science. The faculty of the University of Southern California (USC) first developed it in the 1980’s. Its roots are deeply embedded in the conceptualisation of the occupational behaviour frame of reference used by Mary Reilly and her graduate students, and the sensory

integration theory developed by A. Jean Ayres (Yerxa et al, 1989). It is the first science developed by occupational therapists and rooted in occupational therapy's basic philosophical assumptions about occupation. It was born out of a need for a body of knowledge to support the practice of occupational therapy (Blanche and Henny-Kohler, 2002).

Occupational science was originally defined by the faculty of the USC in 1987 as "the study of the human as an occupational being including the need for and capacity to engage in and orchestrate daily occupations in the environment over the lifespan. Because of the complexity of occupation, occupational science synthesises knowledge from an array of disciplines (biological and social sciences) and organises it into a system model" (Yerxa et al, 1989, p.6).

Occupational science may also be defined as "the systematic study of all aspects of the relationship between humans and occupation, occupation encompassing people's goal-directed use of time, energy, interest and attention in work, leisure, family, cultural, self-care and rest activities" (Wilcock, 1991, p.297). It has been described recently as both basic and applied human science, concerned with the study of form, function and meaning of occupations inside and outside the therapeutic context (Zemke and Clark, 1996).

Occupational Science and Occupational Therapy Practice

A central concern of occupational science is to understand the process involved in orchestrating an individual's daily round of activities in order to achieve health, the necessities of life, and to obtain satisfaction from daily living. The emphasis is on analysing how engagement in different occupations impacts upon the individual throughout the life span, how these promote coping and competence, and how they affect health (Primeau, Clark and Pierce, 1990).

As occupational science makes advances in the understanding of occupation and predictions of its effects upon the individual, occupational therapy may draw upon these advances to prescribe interventions and preventive programmes. Occupational science enables occupational therapists to see clients not only as

biological, psychological, and social beings, but also as occupational beings (Primeau et al, 1990). With this fuller view of an individual, occupational therapists will be able to use occupation to optimise his or her quality of life, and also participation in different productive activities.

As defined by the faculty of the USC in 1987, occupational therapy is “therapeutic intervention that promotes health by enhancing the individual’s skills, competence, and satisfaction in daily occupations. In order to accomplish this, it applies the principles of occupational science to enable people with chronic disease or disability to act on the environment and successfully adapt to its challenges” (Yerxa et al, 1989, p.6). The key role of occupational therapists is to guide clients in a routine of balanced daily activity (Primeau et al, 1990).

Occupational therapy was concerned with the effects of occupation upon the individual’s quality of life. The science of occupation provides occupational therapists with the scientific foundation for what they do. It justifies the significance of occupational therapy to health, and differentiates occupational therapy from other disciplines (Yerxa et al, 1989).

Engagement in Occupation to Support Participation

The phrase “engagement in occupation to support participation” is the overarching statement that describes the profession’s domain adopted by the American Occupational Therapy Association (AOTA) in their practice framework (AOTA, 2002, p.611). Engagement in occupation provides the practice essential for the emergence, refinement, and eventual maintenance of skills necessary to function independently in society (Kellegrew, 1998). This underlines the importance of occupational therapy in helping individuals to naturally make the transition to participating in a variety of real life contexts that are meaningful to them.

As described by the World Health Organisation (WHO) in the new *International Classification of Functioning, Disability and Health* (ICF; WHO, 2001), participation is the involvement in a life situation and has a positive influence on health and well-being. The WHO recognised that health can be affected by the

inability to carry out activities and participate in life situations as well as by problems that exist with body structures and functions. Occupational therapy is in a unique position to facilitate the participation of individuals with and without disabilities in different occupations by addressing problems at different levels (Law, 2002).

Although participation is known to improve quality of life, evidence also exists that lack of participation (or **occupational deprivation**) can lead to poor health and lack of well-being when individuals are unable to do what is necessary and meaningful in their lives due to different restrictions (Whiteford, 2000). **Occupational imbalance** occurs when individuals engage in too much of the same type of activity and do not fully exercise their various physical, mental and social capacity. Individuals can become **occupationally alienated** if they are unable to meet basic occupational needs, or use their particular capacities (Wilcock, 1998).

The Impact of ADHD on the Parents and Children's Engagement in Occupations

The diagnostic criterion D for ADHD (see Appendix A), published in the Diagnostic and Statistical Manual of Mental Disorder – 4th Edition (DSM-IV; American Psychiatric Association, 1994, p.84), states that “there must be clear evidence of clinically significant impairment in social, academic, or occupational functioning”. It highlights the impact of the disorder on the child's development and engagement in different occupations. It is important to examine the issues further in order to justify the role of occupational therapy.

Raising a child with ADHD often provokes crises in the family schedule of daily activities. The symptoms of ADHD generally interfere with the family's schedule and disrupt the reliability and predictability of activities of ordinary daily life (Segal and Frank, 1998). As a result, the family is frequently required to apply different adaptation strategies. Frank (1996, p.50) defined adaptation as “a process of selecting and organising activities (or occupations) to improve life opportunities and enhance quality of life according to the experience of individuals or groups in

an ever-changing environment”. Most parents of children with ADHD will need support and resource to learn and to apply different adaptation strategies in the family’s schedule.

Children with ADHD will benefit from occupational therapy grounded in occupational science. These children, owing to their maladaptive behaviours, may not develop to their potential because of the lack of opportunities to participate in productive and meaningful activities. They are stressed by negative participation in poorly chosen occupations. From the environmental perspective, children with ADHD frequently shift their attention to different aspects of the environment (Barkley, 1997). Although the complete environment is available to them, the random activation of various perspectives of the environment leads to an erratic picture from which to operate. As a result, children with ADHD fail to participate in different learning and social activities successfully. It is, therefore, important to adapt and modify the environment in order to enable the child with ADHD to act, do and become a successful occupational being within different situations.

Furthermore, most children with ADHD lack negotiating skills in play and social interaction because of their impulsive, inattentive and hyperactive behaviours. They have difficulty entering a group, initiating play with peers, sustaining a co-operative interaction, and sharing toys and space with playmates. Quite often, they choose to play alone, play with younger children or children with a disability (Leipold and Bundy, 2000). They need support to develop appropriate skills in order to engage in different play and social activities, which are important occupations for children.

Paediatric Occupational Therapy for Children with ADHD

One cornerstone of the practice of occupational therapy is the philosophy that engagement in meaningful occupation facilitates the adaptive process, thereby promoting health and well-being (Wood, 1996). The role of paediatric occupational therapy for children with ADHD will be guided by the basic understanding of the development of normal skills enabling engagement in occupations. From the developmental perspective, occupation is defined “ as

culturally valued, coherent patterns of actions that emerge through transaction between the child and the environment and as activities the child either wants to do or is expected to perform” (Humphry, 2002, p.172). The intention behind an action qualifies it to be ‘occupational’ when the activity is carried within the appropriate context.

The concept of occupation has special importance to the lives of parents and children with ADHD. The science of occupation explores the role of childhood occupations in fostering adult competence. Mailloux, Knox, Burke, and Clark (1985) postulated that occupations engaged in in early childhood provide the foundations on which tomorrow’s life experiences as an adult will be built. They suggested that each developmental period should provide the solid base of a rich repertoire of experience to best support later abilities. For example, preschool occupations provide the foundations for school success and for the social skills needed in middle childhood, and the occupations of middle childhood develop many of the skills that will be needed in adolescence. Therefore, it is important to develop therapeutic programmes to help children with ADHD to acquire the necessary developmental skills in order to enhance their engagement in different childhood occupations.

Occupational therapists believe that environment, which includes the physical, social, cultural, and temporal factors, is important to successful performance and participation in different occupations (Dunn, Brown, McClain and Westman, 1994). Adapting or modifying the environment in which the child and parents carry out different occupations will facilitate their engagement in different purposeful activities through the day. It is also important to ensure that the tasks selected are appropriate to the child’s level of development and performance skills.

Paediatric occupational therapy based on the science of occupation may address the coping problems of the whole family. Brennan (2005) suggests that in working with children and their families in early intervention services, the age-related occupations of each need to be considered and incorporated into the treatment plan. Recognition of the parents and children as occupational beings may lead to the

assessment and treatment of the balance of work, rest, and play within the family's schedule of daily routines. Occupational therapists can assist parents to acquire essential management skills needed to run the household efficiently, to organise a schedule of productive activities for the whole family, to reduce family stress, and to maximise each family member's opportunity to participate in meaningful and purposeful activities.

The practice of paediatric occupational therapy tends to be multi-faceted in nature. It will address issues related to the child, the task (occupation) carried out by the child and also the environment in which the task is carried out. For participation in different occupations to be meaningful and successful, a "just right" level of challenge is needed. This includes a supportive environment to facilitate easy attention to the tasks, a feeling of choice or control over the activity, a sense of challenge from the activity, and also a sense of mastery in the completion of the task (Law, 2002). Occupational therapists have the necessary skills to provide the "just right" level of challenge to parents and children in order to facilitate their participation in different productive activities for health and development. As Wilcock (1998, p.248) noted, "occupational therapists are in the business of helping people to transform their lives through enabling them to do and to be".

In summary, paediatric occupational therapy focuses on enabling parents and children with ADHD to participate in everyday occupations that are meaningful to them, providing fulfilment, and engaging them in everyday life with others. Occupations shape the quality of one's life and also facilitate adaptation. The focus is on enhancing participation (Primeau et al, 1990).

THE PROCESSES OF SCIENTIFIC INQUIRY

Kielhofner (1992) states that occupational therapy has emerged and continues to exist because it has an implicit social responsibility to address the problems of those members of society who have limited capacity so that they can perform in their everyday occupations. This requires the application of occupational therapy knowledge that defines and guides the decisions, actions, and techniques of therapists. Kielhofner further emphasises that without the force of that conceptual

foundation, which explains and justifies the service, the pragmatic work of therapists would have little value for society. The development of the conceptual foundations of occupational therapy has been influenced by many factors.

In order to develop a model of practice for children with ADHD that is evidence-based, that addresses the domains of concerns within occupational therapy and that also integrates theory into practice, different processes of scientific inquiry will need to be carried out in this study. Mosey (1992) defined applied scientific inquiry as a form of investigation that uses the methods of science and either theoretical information or research designs for the purpose of arriving at immediate practical ends. She proposed that there are two distinct types of applied scientific inquiry:-

1. **Applied Type I Scientific Inquiry** is the use of the methods of science and of theoretical information to formulate some sort of guidelines for action. In relation to health professions, these guidelines are referred to as sets of guidelines for practice – that is, integrated assemblages of information, extrapolated from theories and empirical data, that provide direction for identifying and resolving clinical problems with clients.
2. **Applied Type II Scientific Inquiry** is the use of the methods of science and research designs to answer specific practical questions. Typically, these are questions related to quantity, quality, value, safety, or effectiveness. One common issue in health professions is refining and assessing the adequacy of sets of guidelines for practice. “Adequacy” refers to such matters as the reliability and validity of problem identification and the safety, effectiveness, efficiency, and acceptability to clients of the means employed for problem resolution.

PROCESSES OF DEVELOPING A MODEL OF PRACTICE

Knowledge development in a profession is not the mere accumulation of facts. Philosophical beliefs, value, facts, theories, assumptions, concepts, and technology exist together and constantly change (Mosey, 1992). To understand and synthesise

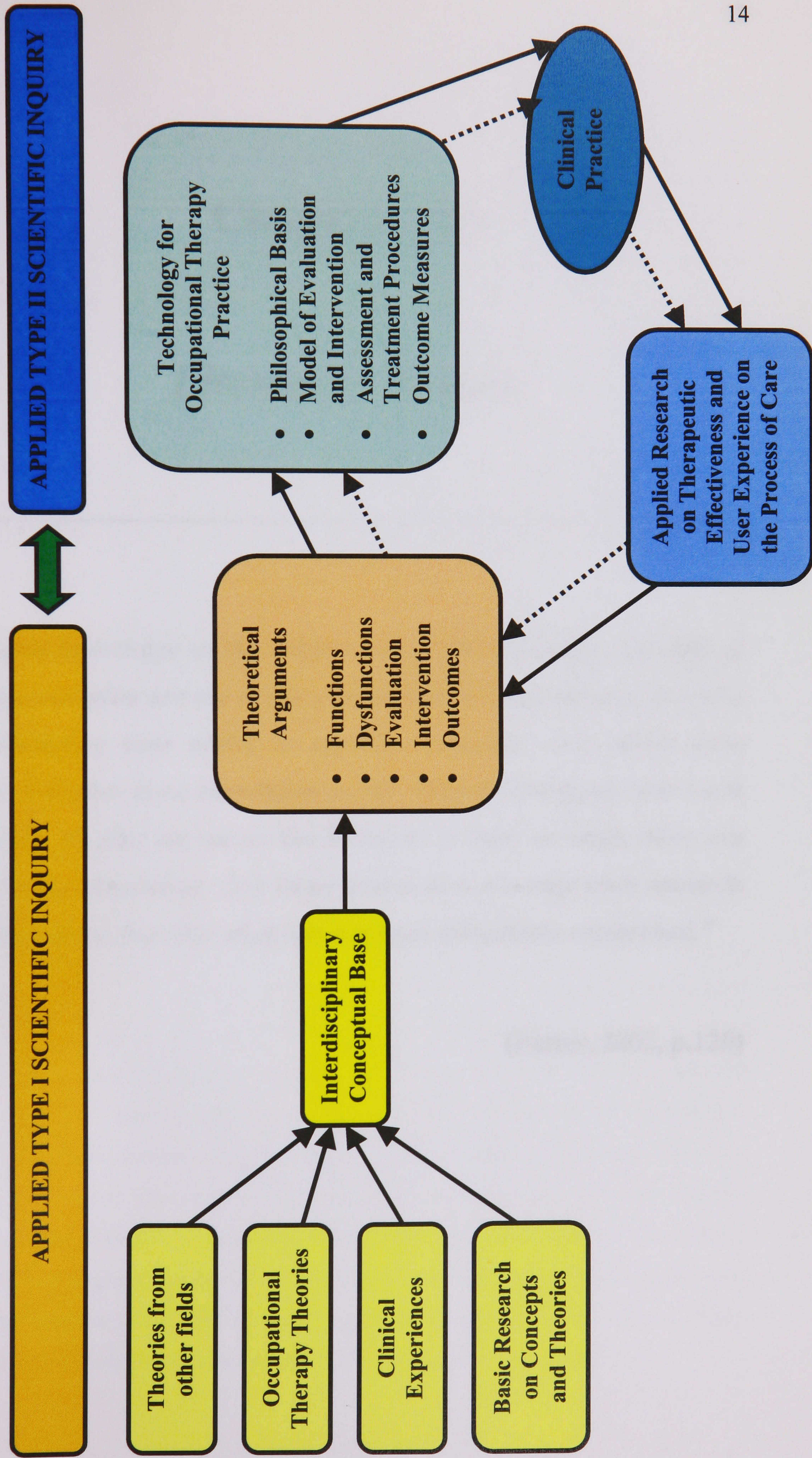
the field's knowledge, we must see all these forms of information in relation to each other. Based on these premises, the author decided to use the Applied Type I and Type II scientific inquiry to develop a model of practice in occupational therapy for children with ADHD. The goal is to develop a structure in order to establish coherence among the current concepts, research evidence, and assessment and treatment techniques in occupational therapy.

Figure 1.1 illustrated the processes involved in developing a model of practice (adapted from Mosey, 1992 & Kielhofner, 1992). The processes are not linear but entail moving back and forth among various phases and steps within phases and between Applied Type I and Type II inquiry (Mosey, 1992). In applying the Type I inquiry in developing an evidence-based model of practice for children with ADHD, one will draw theoretical information from different fields, from occupational therapy theories, from clinical experience and also information from different basic research on concepts and theories. It helps to formulate an interdisciplinary conceptual base for different theoretical arguments, for example, the differentiation of functions and dysfunctions, and also processes of evaluation, intervention and outcome measure (Kielhofner, 1992).

In applying the Type II inquiry, a set of practice guidelines is formed, refined, and assessed throughout the process, which constitutes the technology for occupational therapy practice. The developed model of practice will be applied to clinical practice and subjected to scientific validation by using applied research on therapeutic effectiveness and user experience on the process of care. Information generated through applied research will be used to refine the model of practice.

In this study, the model of practice was developed and validated by following the processes illustrated in **Figure 1.1**. More detailed description on each stage of study will be presented in Chapter Three and subsequent Chapters.

FIGURE 1.1: Processes of Developing a Model of Practice (adapted from Mosey, 1992 & Kielhofner, 1992)



Chapter Two

Literature Review

“To gain knowledge on the subject area. This is a matter not only of finding out what are the major research issues and debates, but also of developing your ability to appraise critically what others have done. Who has done interesting work? Why do you think their work is good? To find out where the literature is thin, or where there are gaps in the knowledge. It is important to note not only what research has been done, but also what has not been adequately researched.”

(Potter, 2002, p.120)

INTRODUCTION

The category of Attention Deficit Hyperactivity Disorder (ADHD) has been used widely in the United States of America (USA). It is the most common neuropsychiatric disorder of childhood (Voeller, 2001). In the United Kingdom (UK), there has been a substantial increase in clinical activity related to children with ADHD (Bramble, 1997). As a childhood disorder, it is better studied from genetic, biological, neurological, psychological, behavioural and environmental perspectives.

Although articles on literature review of ADHD have been published, their content is mainly focused on certain aspects of the condition e.g. the medical aspect (Biederman, 1991) and the historical perspective (Conners, 2000). Most of these articles are more relevant to medical and psychological professionals. As research on ADHD is progressing rapidly, it is important to have a regular literature review which is based on current research information. This literature review will provide contemporary foundation knowledge of the condition pertaining to the practice of occupational therapy.

In the first half of this chapter, a comprehensive review of literature will focus on the diagnosis of ADHD as a specific childhood disorder. Information on the historical perspective of the disorder, current definition, diagnostic classification systems, primary clinical features, prevalence, etiology, comorbidity and prognosis will be reviewed. The etiological factors of ADHD will be synthesised by creating a model of interaction between the child and the environment at different levels of functions. In the second half of this chapter, information related to evidence-based evaluation and intervention procedures will be synthesised by integrating information from different current research studies. Multi-dimensional evaluation and multi-faceted intervention procedures are advocated to address different aspects of the disorder. Controversies, limitations and gaps in knowledge will be identified throughout the review. Potential research objectives will be outlined in order to improve occupational therapy services for children with ADHD. They will form the basis for different research objectives within this study.

HISTORICAL PERSPECTIVE

Children with features of ADHD were described as early as 1798 by a Scottish-born physician Alexander Crichton. In his book *An Inquiry into the Nature and Origin of Mental Derangement*, Crichton carefully described a range of attentional problems in otherwise healthy young people. It represented an early description of ADHD (Palmer and Finger, 2001). The label for the condition has changed many times in the last hundred years. The development of ADHD as a category of childhood mental disorder has a rich history.

Table 2.1 outlines the four periods of development in the conceptualisation of the diagnosis of ADHD (British Psychological Society, 1996; Barkley, 1998a; Conners, 2000). The first period (from 1900 to 1960) focused on identifying the organic or biological origin of the condition and also on categorising the condition as a distinctive childhood disorder. Due to the lack of evidence of identifiable biological causes, the category of “minimal brain dysfunction (MBD)” was introduced. In the late 1960s, the lack of specificity of the term MBD led to a reappraisal of the labelling of the condition. The focus was shifted from searching for the biological basis to defining the condition by observable behavioural expression. The term “hyperkinetic reaction of childhood” was introduced. It marked the first stage in the emergence of the concept of ADHD. Since then, the emphasis on the behavioural pattern has changed from hyperactivity to attention deficit. As a result, the category of Attention Deficit Disorder (ADD) was introduced in 1980 in Edition 3 of the *Diagnostic and Statistical Manual of Mental Disorder (DSM-III)*. In the revised edition of DSM-III in 1987, ADHD was introduced as one single category. In 1994, the three subtypes of ADHD were introduced in Edition 4 of the DSM (American Psychiatric Association, 1994). The clinical feature of impulsivity was highlighted. Researchers attempted to develop different theories to explain the range of behavioural patterns presented by children with ADHD. The current focus is on a model of self-regulation and executive functions. All these changes have provided clinicians with a good foundation for understanding the condition and developing appropriate assessment and treatment procedures.

Table 2.1: An Historical Perspective in the Conceptualisation of the Diagnosis of ADHD

1900 to 1960: From Organic Deficits to Minimal Brain Dysfunction (MBD)
<ul style="list-style-type: none"> • In 1902, George Frederick Still, a British Paediatrician, described in <i>The Lancet</i> a group of children who showed a range of abnormal dysfunctions of sustained attention, restlessness and fidgetiness, and argued that there may be a biological origin for these deviated behaviours (cited in BPS, 1996). • After the First World War, a group of children presented diverse behavioural problems that resulted from encephalitis (Hohman, 1922). • Bradley (1937) discovered that the psycho-stimulant amphetamine could reduce levels of hyperactivity and behavioural problems. This strengthened the condition as a distinctive group and also its biological or organic basis. • In 1957, Methylphenidate (Ritalin) was first introduced for the treatment of children with hyperactivity (Laufer, Denhoff and Solomons, 1957). The use of medication strengthened the condition as a distinctive group, and also its biological basis. • In 1960s, the category of “Minimal Brain Dysfunction (MBD)” was used as no frank neurological damage could actually be identified (Clements, 1966).
1960 to 1970: The Development of a Symptom-Oriented Classification System
<ul style="list-style-type: none"> • In the late 1960s, the lack of specificity of the term MBD (i.e. little evidence for brain dysfunction existed) led to a diagnostic reappraisal (Ross and Ross, 1976; Douglas and Peters, 1978). • In 1968, the <i>Diagnostic and Statistical Manual of Mental Disorders – Edition II (DSM-II)</i> introduced the term “Hyperkinetic Reaction of Childhood”. This term focused on observable overactive behaviour, and ignored the possible biological basis. • This shift in emphasis from aetiology to behavioural expression as the diagnostic orientation marked the first stage in the emergence of the concept ADHD i.e. the symptoms had become the syndrome (Reid, 1995).
1970 to 1990: From Hyperactivity to Attention Deficit
<ul style="list-style-type: none"> • The arguments put by Douglas (1972) that hyperactive children usually performed badly on standardised tests of attention triggered off an important turning point that attention and not hyperactivity was the key feature that distinguished children with ADHD from other difficult and disruptive children. • In 1980, the DSM-III established the category of “Attention Deficit Disorder (ADD) with and without Hyperactivity”. • In 1987, the DSM-III-Revised introduced “Attention Deficit Hyperactivity Disorder” as one single category. • In 1993, the International Classification of Disease – Edition 10 introduced the category of “Hyperkinetic Disorder (HD)”. • In 1994, the DSM-IV introduced the three subtypes of Attention Deficit Hyperactivity Disorder (ADHD). The clinical feature of impulsivity was highlighted.
1990 to 2000: From Attention Deficit to Dysfunction in Self-Regulation
<ul style="list-style-type: none"> • Barkley (1998b) argued that ADHD is far more than just a disorder of attention and response inhibition. He develops a Model of Self-Regulation incorporating executive functions to explain the nature of deficits experienced by individuals with ADHD (Barkley, 1997). • Based on Barkley’s Model, Coddington, Lawrence, Lewandowski and Gordon (2003) found that boys with ADHD did present executive dysfunction. They advocated further research to validate the model as a means of understanding the psychological basis of ADHD.

WHAT IS ATTENTION DEFICIT HYPERACTIVITY DISORDER?

Definition of Attention Deficit Hyperactivity Disorder (ADHD)

ADHD is a specific neuropsychiatric disorder. The behaviour of children “appears impulsive, overactive and/or inattentive to an extent that is unwarranted for their developmental age and is a significant hindrance to their social and educational success” (British Psychological Society, 1996, p.8). The child’s behaviour is ill-organised and unproductive. As a developmental disorder, it can be identified in childhood and continued into adulthood.

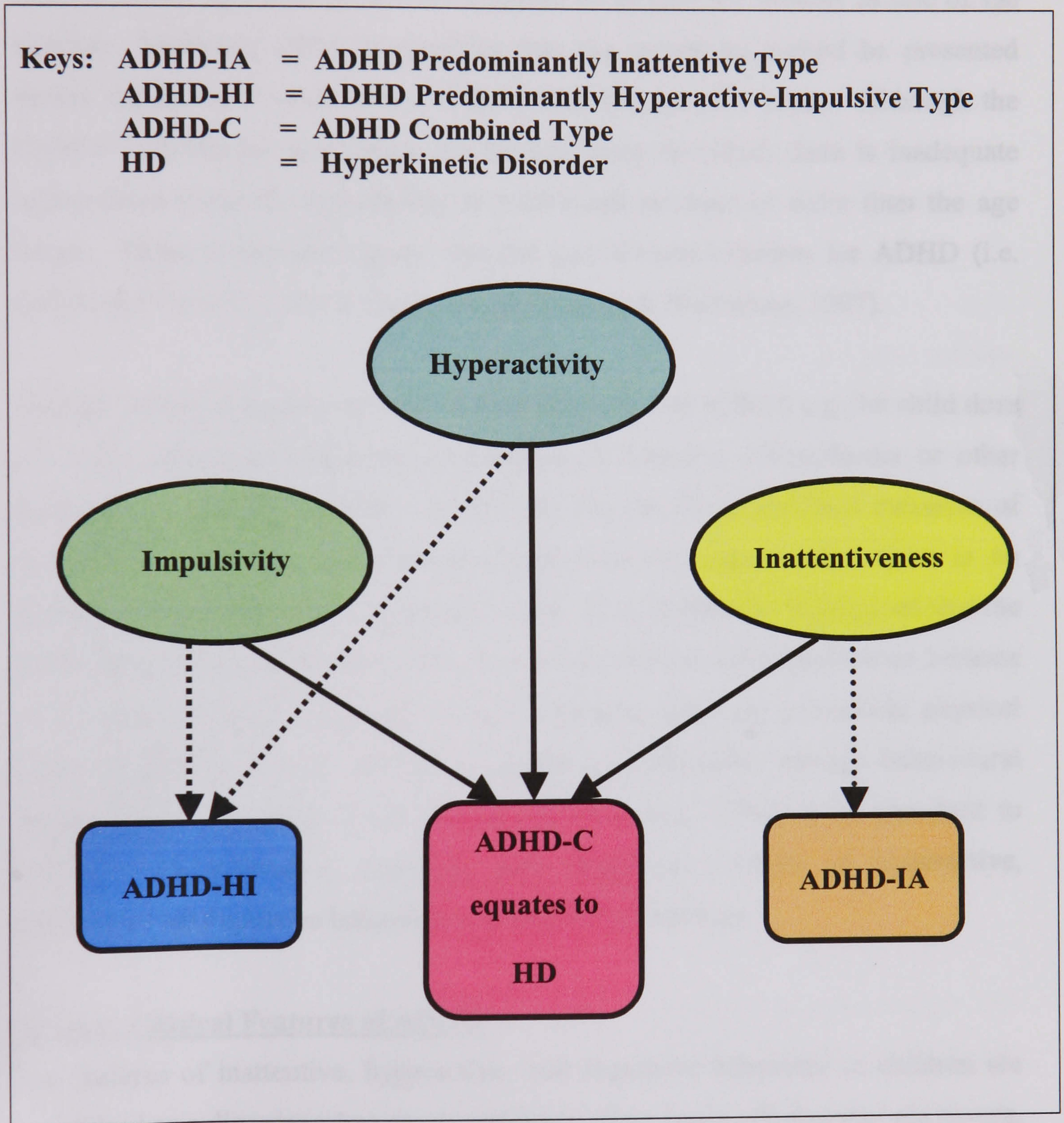
Diagnostic Classification Systems of ADHD

There are two diagnostic classification systems being used in different parts of the world: the Diagnostic and Statistical Manual of Mental Disorders – Edition IV (DSM-IV) (American Psychiatric Association, 1994), and the International Classification of Disease – Edition 10 (ICD-10) (World Health Organisation, 1993). In the DSM-IV (see **Appendix A**), three sub-types of ADHD are delineated: a) ADHD-Predominantly Inattentive Type, b) ADHD-Predominantly Hyperactive-Impulsive Type, and c) ADHD-Combined Type. The category of ADHD Not Otherwise Specified (NOS) will be used for disorders with prominent symptoms of inattention and hyperactivity-impulsivity that do not meet the full criteria for Attention-Deficit/Hyperactivity Disorder. **Figure 2.1** illustrates the three-factor model described in the DSM-IV. While in the ICD-10, the category of Hyperkinetic Disorder (HD) is used. Swanson, Sergeant, Taylor, et al (1998) discussed the differences and similarities between ADHD and HD and suggested that HD is a subtype of ADHD i.e. equated to the ADHD-combined type.

The dimensional concepts of inattention and hyperactivity-impulsivity described in the DSM-IV need to be validated by further research. For example, Carlson, Shin and Booth (1999) proposed that further research is needed to clarify whether or not it is best to consider the ADHD-Inattentive type as a separate disorder. The author’s clinical experience indicates that children with the Inattentive Type have very different behavioural patterns. They are not usually identified until a later

stage in their education. They require different management strategies. They are also not good responders to psycho-stimulant treatment (Hutchins, 1994 and Wodrich, 1994).

Figure 2.1: The Three-Factor Model of ADHD



In both DSM-IV and ICD-10, behavioural indicators are used to describe the symptoms of hyperactivity, inattentiveness and impulsivity (though the category of impulsivity is not specifically highlighted in ICD-10). The presence of these symptoms across two or more settings (e.g. at school and at home) is emphasised.

Both diagnostic classification systems state that there must be clear evidence of clinically significant impairment in social, academic or occupational functioning. Within ICD-10, these symptoms need to be directly observed by the clinician and not just reported by parents or teachers.

Both DSM-IV and ICD-10 use the duration of at least six months as one of the criteria. However, DSM-IV specifies that the symptoms should be presented before the age of 7 years, while ICD-10 uses the age of 6 years. Although the DSM-IV criteria are appropriate for the age range specified, there is inadequate information about its applicability to individuals younger or older than the age range. There is ample evidence that the age-of-onset criterion for ADHD (i.e. before age 7 years) needs re-examination (Barkley & Biederman, 1997).

Similar exclusion criteria are used in both DSM-IV and ICD-10 e.g. the child does not meet criteria for pervasive developmental disorder, schizophrenia or other psychotic or neurotic disorder. In ICD-10, the use of standardised measures of hyperactive behaviour and attentional problems is suggested but there is no recommendation on the use of specific tools. ICD-10 has also highlighted that the child needs to have an IQ above 50. As a result, HD has lower prevalence because of the more stringent diagnostic criteria. Because there are no specific physical characteristics associated with the condition, it is identified through behavioural manifestations (Dowdy, Patton, Smith and Polloway, 1998). It is important to highlight the pervasive, persistent and impairing patterns of hyperactive, inattentive and impulsive behaviour across different settings.

Primary Clinical Features of ADHD

The features of inattentive, hyperactive, and impulsive behaviour in children are recognised as a disorder when combinations of these types of behaviour are severe, developmentally inappropriate, and impair function at home and school (British Psychological Society, 1996). These core symptoms differ enormously from one individual and situation to another. Therefore, it is important to assess the ADHD child over a period of time and in different environments. The following are the three core symptoms of ADHD:-

Inattention. The features of inattention involve deficits in arousal level control, focused attention in visual and auditory channels, vigilance and also distractibility. The inability to regulate arousal levels remains an important feature of ADHD. Hypoarousal lies at the core of the impairment i.e. a reduced response to stimuli that would facilitate attention and have motivational significance (Voeller, 2001). The concept of hypoarousal was introduced by Kinsbourne (1983) and Zentall and Zentall (1983). They suggested that individuals with poor attention control caused by low arousal levels tend to use hyperactive behaviour to “wake up” their nervous systems. This behavioural pattern is consistent with those caused by deficits in the medial prefrontal, anterior cingulate areas, and related subcortical structures, as well as other limbic system structures (Cummings, 1993)

Common features include inability to sustain concentration on any activity requiring focused thought, tasks left unfinished, constant moving from one activity to another, more off-task behaviour and more attention to irrelevant stimuli i.e. distractibility. These behavioural symptoms are a significant hindrance to the child’s successful participation in different occupations within different life situations e.g. home, school, and community. It is important to note that under laboratory conditions children with ADHD do not present true deficit of sustained attention (Van der Meere, 1996). They can attend well to tasks with a frequent intrinsic rate of reward. The problem is most evident when the task is taxing, not immediately rewarding, and imposed. The fact that a child can apparently watch TV or play computer games for half an hour does not invalidate the diagnosis of ADHD (Hill and Cameron, 1999).

Hyperactivity. There is excessive motor activity inappropriate to the child’s age and compared with what is demanded by the situation e.g. fidgeting, squirming, difficulty remaining seated, noisiness, incessant talking, and a high level of activity. Porrino, Rapoport, Behar, Sceery, Ismond, and Bunney (1983) found that ADHD boys displayed an overall greater activity level than the control group across a variety of settings, including during sleep. However, Lecendreux, Konofal, Bouvard, Falissard, and Mouren-Simeoni (2000) found that there were no significant differences in sleep variables between boys with ADHD and controls,

though children with ADHD were more sleepy during the day. Hill and Cameron (1999) indicated that an ADHD child might not be overactive in a 20-minute clinical interview. They suggested prolonging the interview or providing cognitively demanding tasks for completion in order to bring restlessness out. Hyperactivity is most evident during settled, restrained seated activities in the classroom, mealtimes or long car journeys, and in activities that are not cognitively challenging such as free play with others (Taylor, Sandberg, Thorley and Giles, 1991).

Impulsivity. There is an observable pattern of behaviour that is reckless, unthinking, impetuous and disinhibited so that ADHD children are frequently in trouble for careless behaviour or for paying no heed to social rules. They are also likely to have accidents. In social settings, they are impatient, butting in too soon, interrupting, answering questions before they have been completely put, and failing to wait for their turn. They are also likely to be cheeky and reckless, provoking adult social restraint (Hill and Cameron, 1999).

It is usually the case that children with ADHD respond best when stimuli are presented rapidly and do worse when they have to alter their rate of response, respond slowly or respond to a slower rate of task presentation (Sergeant, 1988). Scientifically, there are competing explanatory models for impulsivity. Sonuga-Barke, Taylor, Sembi, and Smith (1992) maintained that it is an aversion to delay i.e. children with ADHD cannot wait for their turn. Barkley (1997) hypothesised that it is a failure to inhibit a behavioural response. As a result, children with ADHD tend to act impulsively without careful thinking about the consequences. Van der Meere (1996) explained that there is a general difficulty with state regulation so that there is stimulus seeking as well as inappropriate allocation of mental effort to the task in hand.

The Prognosis of ADHD

Follow-up studies in the USA have confirmed poor prognosis in terms of psychosocial development, educational outcomes and occupational ranking for children with ADHD (Mannuzza, Klein, Bessler, Malloy, and LaPadula, 1993).

The prognosis is influenced by the severity of symptoms, comorbidity, IQ, family situation, parental pathology, family adversity, social-economic status, and treatment received (Ingram, Hechtman, and Morgenstern, 1999). Taylor et al (1996) found that hyperactive behaviour was a strong risk factor for later psychiatric diagnosis. Results of these studies support the argument for the early recognition and treatment of ADHD/HD in childhood.

PREVALENCE OF ADHD

Table 2.2 lists the prevalence rates of ADHD in different countries. The prevalence rate seems to be higher in the USA. This could be related to the fact that the term has become so widely used by psychologists, teachers and parents that it has become a very inclusive category.

Table 2.2: Prevalence of ADHD in Different Countries

In the United States of America (USA)
<ul style="list-style-type: none"> • In the DSM-IV, the estimated prevalence rate is 5% (APA, 1994) • In examining a large birth cohort of 5,718 in Rochester, Minnesota, Barbaresi et al (2002) found that the prevalence of ADHD is as high as 16% when using least stringent criteria (definite + probable + questionable) and about 7.5% when using the most stringent criteria (definite only).
In Australia
<ul style="list-style-type: none"> • Gomez, Harvey, Quick, Scharer, and Harris (1999) studied the prevalence rates of the three ADHD types among primary school children, they found that there are 1.6% Inattentive Type, 0.2% Hyperactive-Impulsive Type, and 0.6% Combined Type. • The ratio of male to female is 5 to 1. • This study supported the three-factor model of ADHD.
In Sweden
<ul style="list-style-type: none"> • Gillberg and Rasmussen (1982) and Gillberg, Carlstrom, Svenson and Waldenstrom (1982) proposed the category of "DAMP" (Deficits in Attention, Motor Control and Perception) i.e. the combination of ADHD and Developmental Coordination Disorder (DCD). They identified that 1.2% of the whole general population of 6- to 7-year-olds had DAMP. • In a recent population study of 409 7-year-olds in a middle-sized Swedish town, the rate of severe problems in the fields of ADHD, DCD and DAMP was 6.1%, with boys being affected more frequently than girls (Kadesjo and Gillberg, 1998).
In the United Kingdom (UK)
<ul style="list-style-type: none"> • When using the category of Hyperkinetic Disorder, the estimated prevalence rates are:- <ul style="list-style-type: none"> - 1.5% in 7-year-old boys in inner cities (Taylor et al, 1991), - 0.5% to 1% of the child population (Taylor and Hemsley, 1995), and - 1 % of school-aged children i.e. about 69,000 6-16 year olds in England and 4,200 in Wales (NICE, 2000). • When using the category of ADHD, there are around 5% of school-aged children i.e. 345,000 in England and 21,000 in Wales (NICE, 2000).

The discrepancies in prevalence rate may also be explained by differences in the ways of using the diagnostic criteria. More stringent criteria naturally result in lower estimates, and these criteria may be the most desirable for identifying true cases of the disorder (Barbarese, Katusic, Colligan, Pankratz, Weaver, Weber, Mrazek and Jacobsen, 2002).

The use of different classification systems (i.e. ICD-10 and DSM-IV) may also result in different figures. The apparent difference in prevalence between the UK and the USA is an issue of diagnostic practice, training and attitude, not an epidemiological difference (Prendergast, Taylor, Rapoport, Bartko, Donnelly, Zametkin, Ahearn, Dunn, and Wieselberg, 1988). Generally speaking the estimated prevalence rate of 5% is usually adopted in the UK for service planning and development (NICE, 2000).

OCCUPATIONAL THERAPY FOR CHILDREN WITH ADHD

For a long time occupational therapists who worked in the field of child mental health used concepts and components from a variety of sources and made them occupational therapy in the way the ideas were clinically applied. This approach appeared to be satisfactory for many therapists in paediatric psychosocial settings, but little information about the structure and successes of therapy were documented (Cronin, 1996).

As discussed in Chapter One, the role of occupational therapy for children with ADHD will be guided by the basic understanding of development of normal skills enabling engagement in occupations. Occupational therapists may use a range of facilitatory strategies to enable parents and children with ADHD to participate in everyday occupations that are meaningful to them. Strategies may include setting up a supportive environment to facilitate attention to tasks, remediation of underlying sensory processing dysfunction, and the selection of tasks at a “just right” level of challenge in order to promote a sense of mastery. Occupational therapists believe that successful participation in occupation shapes the quality of the child’s life and also promotes early childhood development (Mailloux et al, 1985).

In the USA, occupational therapists who treat individuals with ADHD often use an eclectic approach by integrating different theoretical frameworks and treatment methods (Hanft, 1997). In the occupational therapy literature, the sensory integrative approach is particularly documented in the treatment of ADHD (Ayres, 1964; Kimball, 1986; Oetter, 1986a & b; Cermak, 1988a & b; Lightsey, 1993; Mulligan, 1996; Parush, Suhmer, Steinberg and Kaitz, 1997; Dunn, 1999 & Mangeot, Miller, McIntosh, McGrath-Clarke, Hagerman and Goldson, 2001).

However, there are only a few studies examining the nature, evaluation and treatment of ADHD from an occupational therapist's perspective. Further research is necessary to develop and validate the specific role of occupational therapy for this particular type of developmental disorder.

In the UK, occupational therapy for children with ADHD is a relatively new field. Current knowledge in the field indicates that there are very few occupational therapists who work directly with children with ADHD. This could be related to lack of knowledge and skills, limited resource, lack of clinical guidelines and also the recognition of the role of occupational therapy within the field. Further research is necessary to explore the current practice of occupational therapy in the assessment and treatment of children with ADHD in the UK.

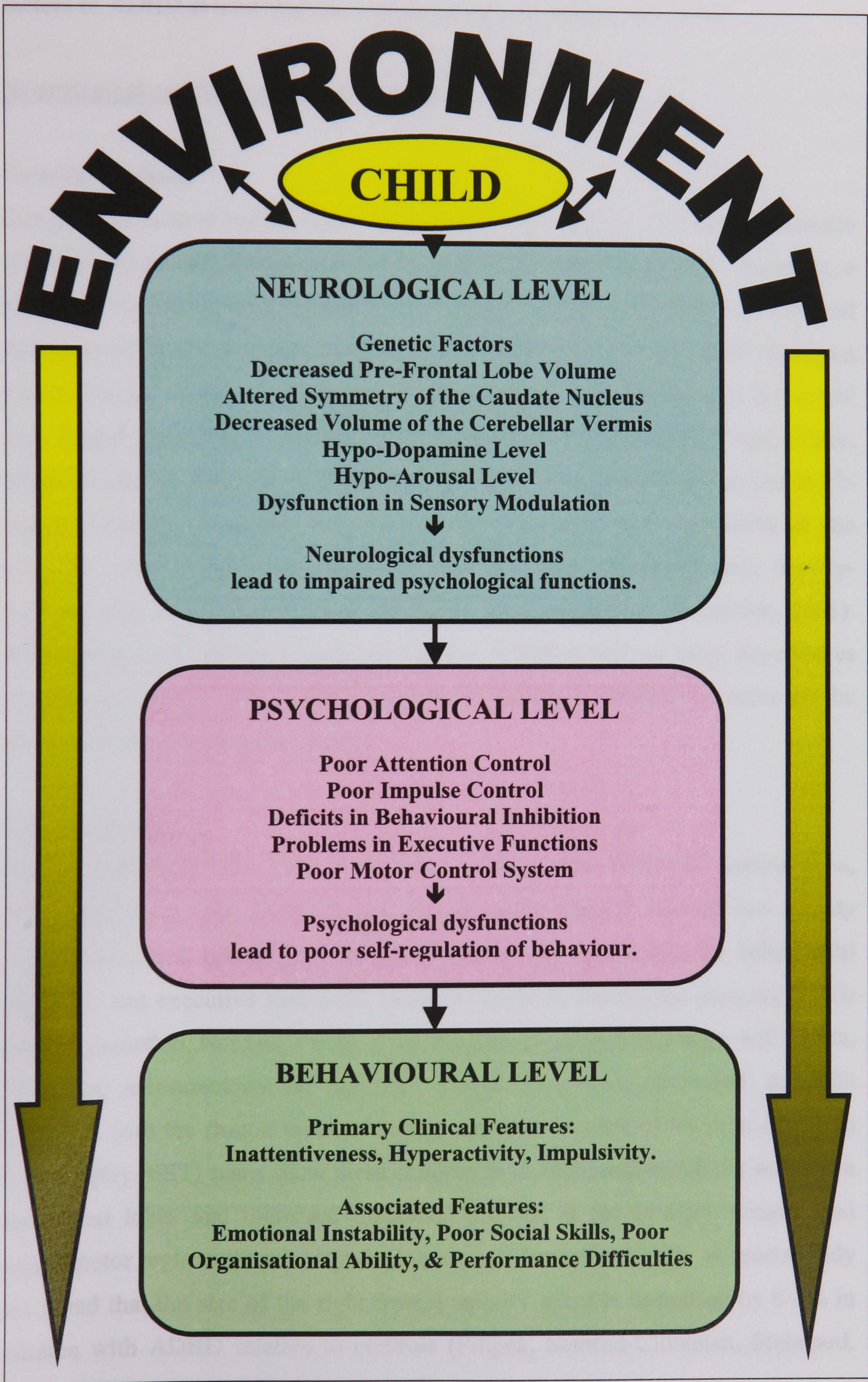
The author's experience suggests that training in the management of children with ADHD is not usually included in the under-graduate programme of occupational therapy courses. Therefore, it is important to identify the training needs of therapists practising in the paediatric field. Occupational therapists need to acquire up-to-date knowledge on the clinical features, diagnostic criteria, etiology and contemporary theories of ADHD in order to make significant contributions in the processes of evaluation and intervention. Therapists also need to acquire practical skills in different treatment methods and assimilate them into a conceptual model of occupational therapy practice. As a result, there is a need to develop a model of practice in occupational therapy for children with ADHD.

THE ETIOLOGY OF ADHD

In reviewing the literature, it was found that different disciplines tend to focus on different etiological factors of ADHD and advocate different assessment and treatment methods. There is both a lack of coherence and no unified view about the causes of ADHD. In order to form the theoretical arguments for reliable evaluation procedures and effective intervention outcomes, it is important to create a coherent model to explain the behavioural manifestation of children with ADHD. The author formulates a model to highlight the interaction between the child and the environment at different levels of functions by synthesising different research evidence.

Although the precise etiology of ADHD cannot be specified, most professionals agree that it is a neurological condition which affects different psychological processes e.g. attention control, behavioural inhibition, and executive functions. From the evolutionary adaptive perspective, the classic triad of symptomatology in ADHD – hyperactivity, inattentiveness and impulsivity – are all potentially and independently adaptive in certain environments. Jensen, Mrazek, Knapp, Steinberg, Pfeffer, Schowalter, Shapiro (1997) view ADHD as a disorder of adaptation, i.e. children with ADHD may function differently in different environments. Environments are the contexts in which children engage in different tasks. These include different physical and social settings, and also cultural factors. Different environments have inherent features that can enable or disable a child's performance. **Figure 2.2** illustrates the possible neurological and psychological factors, their interaction with the environment and the effect on behavioural outcomes. Children with ADHD typically have different symptoms at different times, in different situations and in different environments. For example, some children with ADHD may exhibit considerably better self-control, appropriate behaviour and improved performance with a teacher who maintains a relatively calm atmosphere, is structured, defines his or her expectations for students, provides a great deal of positive reinforcement (DuPaul and Stoner, 2003). Therefore, with appropriate support from the environment, children with ADHD may be able to function effectively.

Figure 2.2: The Possible Etiological Factors of ADHD



The following sections summarise research evidence on different aetiological factors of ADHD at neurological, psychological and behavioural level:-

Neurological and Biological Basis of ADHD

Genetic Evidence

Genetic effects have been found to account for about half the variance in measures of hyperactivity and inattentiveness (Goodman and Stevenson, 1989). However, a review of the literature by Hinshaw (1994) suggested that there might be increased incidence of family members displaying psychopathology, which would support a genetic basis. However, the mechanism between genetic factors and the actual neurological pathology is not clear. Recently, LaHoste, Swanson, Wigal, Glabe, Wigal, King, and Kennedy (1996) found that 49% of the ADHD group had the 7-repeat dopamine D4 gene on chromosome, compared with only 20% of the controls. The 7-repeat dopamine D4 gene has been associated with novelty-seeking, impulsivity, exploratory behaviour, and excitability (Bradshaw, 2001). Although the link between genetic factors and ADHD is still not clear, experiences in clinical practice show family patterns of ADHD behaviour in some of the ADHD children being seen clinically.

Neuroanatomy

Frontal Lobes. Single Photon Emission Tomography (SPECT) studies (Lou, 1996) in children with ADHD found reduced cerebral blood flow and low activity in the striatal and orbital prefrontal areas which are responsible for behavioural inhibition and executive functions. In some Magnetic Resonance Imaging (MRI) studies (Zametkin, Nordaht, Gross, King, Semple, Rumsey, Hamberger and Cohen, 1990) the measurements of the right frontal lobe were decreased in width compared with the frontal lobes of normal children. Studies of Positron Emission Tomography (PET) scans show these children have decreased metabolic activity in the frontal lobes and increased metabolic activity in the primary sensory and sensorimotor regions (Riccio, Hynd, Cohen, and Gonzalez, 1993). A recent study has found that the size of the right frontal anterior lobes is decreased by 6-8% in children with ADHD relative to controls (Filipek, Semrud-Clikeman, Steingard, Renshaw, Kennedy, and Biederman, 1997).

Caudate Nucleus and Cerebellum. The Caudate Nucleus (involved in regulating motor control), particularly on the right side, showed decreased metabolism (Hynd, Hern, Novey, Eliopoulos, Marshall, Gonzalez and Voeller, 1993). Filipek et al (1997) found that children with ADHD have an altered asymmetry of the caudate nucleus i.e. left bigger than right, rather than the usual asymmetry of right bigger than left side. Recently, decreased cerebellar vermis has been found in children with ADHD (Mostofsky, Reiss, Lockhart, and Denckla, 1998).

Neurochemistry - Neurotransmitters.

There are two groups of Biogenic Amines (neurotransmitters responsible for neural modulation function) which have implications for ADHD. Rapport (1995) suggested that children who have greater deficits in attention and learning in positive environments might have lower or poorly regulated levels of dopamine which regulates the attentional processes. Sagvolden and Sergeant (1998) demonstrated that the hypo-efficient dopamine system in ADHD children could give rise to neurochemical imbalances. Their argument was based on the Dopamine Theory of ADHD proposed by Levy (1991). Further research is necessary to validate the theory. In contrast, children who are highly impulsive and fail to learn from aversive environments have poorly regulated norepinephrine which plays a part in regulating behavioural inhibition and higher order learning processes. Those who have a disturbance of both systems show both kinds of problems.

Neurophysiology

Abnormal EEG brain activity patterns have been found in the frontal lobes of children with ADHD e.g. slow wave activity mostly in the frontal regions and decreased beta activity in the temporal regions when carrying out a drawing task (Mann, Lubar, Zimmerman, Miller, and Muenchen, 1992). Evoked response studies have suggested that children with ADHD have a reduction in amplitude to both auditory and visual stimuli (Satterfield, Schell and Nicholas, 1994). These studies suggested that children with ADHD have a lower level of brain activities which is related to their poor level of attention control and behavioural inhibition. Silberstein, Farrow, Levy, Pipingas, Hay, and Jarman (1998), by using a steady-

state visually evoked potential response, found significant differences in children with ADHD and a control group of normal children performing a Continuous Performance Test. They suggested that this might reflect prefrontal dopaminergic deficits in ADHD.

Information Processing Functions

Frontal-Subcortical Circuits. In correlating all the evidence, Voeller (2001) proposed to broaden the neurological basis of ADHD to include prefrontal-subcortical circuits. One theory is that the frontal lobe, basal ganglia and thalamus form a system or loop which activates and inactivates other parts of the brain with ascending/arousal and descending/inhibiting pathways. Thus interference with any part of the loop could lead to a variety of different behaviours which are nonetheless clinically similar. This hypothesis is supported by clinical observation that ADHD children tend to seek out a lot of movement stimulation (which activates the ascending / arousal pathways) in order to achieve better attention control. However, further research is necessary to validate this hypothesis and evaluate its application in the assessment and treatment of children with ADHD.

Sensory Integration. Sensory Integration (SI) is the neurological process that organises sensation from one's own body and from the environment and makes it possible to use the body effectively within the environment (Ayres, 1989). Several researchers have noted an association between ADHD and Dysfunctions in Sensory Integration (Kimball, 1986; Lightsey, 1993; Mulligan, 1996; Parush et al, 1997). The association is hypothesised to be linked to the way in which the central nervous system regulates sensory information, especially in the brainstem level, through the process of sensory modulation (Cermak, 1988a & b). Recent research studies have provided evidence of the association between dysfunction in sensory modulation and ADHD (Mangeot et al, 2001 and Dunn and Bennett, 2002).

Sensory modulation is the brain's capacity to regulate and organise the degree, intensity, and nature of responses to sensory input in a graded and adaptive manner, so that an optimal range of performance and adaptation to challenges from the environment can be maintained (Lane et al, 2000). Some children with ADHD

have been identified as being hypo-reactive to various forms of sensory inputs e.g. they present sensory seeking behaviours, whereas other ADHD children have been identified as being over-reactive e.g. they present tactile defensive behaviours.

Kimball (1986) used the Southern California Sensory Integration Tests (SCSIT) to measure 17 ADHD children previously judged to be good or poor responders to Ritalin while in the off-drug state. Results showed that children who were good responders to Ritalin showed a depressed Postrotary Nystagmus (PRN) score and do not present aversive reaction to vestibular stimulation, i.e. under-reactivity to vestibular stimulation. She concluded that there are at least two discernible types of hyperactivity associated with ADHD that are theoretically related to differences in vestibular processing functions, under-reactivity (i.e. too much higher level inhibition) and over-reactivity (i.e. too little higher level inhibition).

Mulligan (1996) carried out a retrospective study to identify and describe the score patterns of children with ADHD (n=309) on the Sensory Integration and Praxis Tests (SIPT) and to determine whether their score patterns differ significantly from those of children without ADHD but with other sensorimotor dysfunctions (n=5371). The results suggest that although there were no significant differences between the ADHD and non-ADHD group in their overall SIPT profiles, subjects with ADHD appeared to have more overall sensory integrative dysfunctions comparing to the subjects without ADHD. However, the ADHD group tended to be less often like the SIPT profile group than did subjects in the non-ADHD group. Also, subjects with ADHD scored lower than subjects without ADHD on Design Copying (p=.006), Space Visualisation (p=.000) (mean scores within normal range), Postrotary Nystagmus (p=.006) and Standing and Walking Balance (p=.002). She recommended that it would be helpful for therapists to consider the areas of praxis and vestibular processing in the evaluation and treatment of children with ADHD.

Parush et al (1997) evaluated the somatosensory functioning in children with ADHD by using a wide range of tactile tasks and tests for physiological correlates i.e. somatosensory evoked potentials (SEP). They found that ADHD children had

fewer skills on different suprathreshold tasks (i.e. the somatosensory subtests of the SIPT e.g. Manual Form Perception, Localisation of Tactile Stimuli, Graphesthesia etc) but not on threshold tasks (e.g. simple texture discrimination). A large percentage of ADHD children were 'tactile defensive'. They recommended a) that the incorporation of tests of suprathreshold somatosensation into test batteries used for the diagnosis of ADHD, b) that the somatosensory deficiency of the ADHD should be considered when designing remedial therapies, and c) that future research should continue to focus on the functioning of the other sensory modalities of ADHD children.

Mangeot et al (2001) compared 26 children with ADHD and 30 normal children by using a laboratory procedure that gauges responses to repeated sensory stimulation by measuring Electrodermal Reactivity (EDR). Parental report measures of limitations in sensory, emotional, and attentional dimensions were gathered using the Short Sensory Profile, the Leiter International Performance Scale – Revised, Parent Rating Subscale, and the Child Behaviour Checklist (CBCL). Compared with the normal sample, the children with ADHD displayed greater abnormalities in sensory modulation on both physiological and parent-report measures. ADHD children also displayed more variability in responses. Currently, there are very few published research studies examining the efficacy of sensory integrative therapy for children with ADHD.

Psychological Basis of ADHD

According to research undertaken in controlled experimental conditions, attentional mechanisms do not seem to be directly implicated in ADHD (Van de Meere, 1996). Barkley (1997) proposed the use of a Model of Self-Regulation to guide our evaluation and intervention of children with ADHD. The Model of Self-Regulation has three components: a) Behavioural Inhibition, b) Executive Functions, and c) Motor Control System. Barkley explained that self-regulation begins with behavioural inhibition, or the delay in response to an event. With behavioural inhibition, it permits the brain's executive functions to occur. Executive functions, monitored by our frontal lobe, seem to incorporate a) volition, planning, and purposive, goal-directed, or intentional action, b) inhibition and

resistance to distraction, c) problem-solving of actions to meet task demands, d) flexible shifting of actions to meet task demands, e) maintenance of persistence towards attaining a goal, and f) self-awareness across time. These executive functions direct and guide productive behaviour through the motor control system. Once a goal-directed behaviour has been chosen through the executive functions and is put into action by the motor control system, behavioural inhibition protects those behaviours from being disrupted by distracting events. Thus, without normal behavioural inhibition, children with ADHD will present a behavioural pattern of inattentiveness, hyperactivity and impulsivity. Self-regulation has a purpose critical to self-preservation i.e. the anticipation of changes in the environment so as to maximize long-term benefits for the individual (Barkley, 1998b). The ability to self-regulate is an important foundation for successful participation in different occupations. Although Barkley's Model is theoretically sound, further research is necessary to test its validity and also its effectiveness in the treatment of children with ADHD.

The Association between ADHD and Low Birth Weight (LBW)

Besides the range of neurological and psychological dysfunctions described, ADHD is also associated with low birth weight. Botting, Powls, Cooke, and Marlow (1997) found that about 23% of very low birth weight children were at risk of ADHD. In a recent study on the association between low birth weight and ADHD, Mick, Biederman, Prince, Fischer, and Faraone (2002) found that ADHD cases were three times more likely to have been born with LBW than were non-ADHD controls. They concluded that 13.8% of all ADHD cases could be attributed to LBW. It seems that the lower the birth weight, the higher the incidence of ADHD related features.

Summary and Conclusions for the Etiology of ADHD

It is clear that there may not be only a single neurological or psychological mechanism accounting for the heterogeneity of behaviour subsumed under the heading of ADHD. The notion of ADHD as a unitary condition is questionable. Pliszka (2002) cautions that the anatomical changes in the pre-frontal lobe, caudate nucleus and cerebellar vermis are not large enough to be diagnostic. Also, it is not

known if they are specific to ADHD or are also present in other neuropsychiatric disorders. It would seem that in practice we need a model of multi-dimensional evaluation to confirm the diagnosis of ADHD. For example, we need assessment tools to evaluate the primary behavioural features pertaining to ADHD and also tools to identify different neurological and psychological correlates for the presenting behavioural patterns. In order to remediate the “roots” of the disorder, a model of multi-faceted intervention is essential to address different aspects of the disorder. At present, most formats of evaluation and intervention procedures are predominantly medically and psychologically based. There is no research on combining therapeutic methods used in occupational therapy (e.g. sensory integrative evaluation and intervention) and other psychological and behavioural approaches. Although experience in clinical practice has demonstrated positive outcomes in this combined method of treatment, it is important to validate the effectiveness through scientific outcome studies.

COMORBIDITY WITH OTHER DEVELOPMENTAL DISORDERS

Many studies have found that over 50% of individuals diagnosed with ADHD also meet the diagnostic criteria for one or more additional psychiatric and developmental disorders (Brown, 2000). The implication of high rates of comorbidity is that simply recognising features of ADHD is not enough and that a full appraisal of the child is necessary. The following are conditions that commonly co-exist with ADHD (see **Figure 2.3**):-

Conduct and Oppositional-Defiant Disorder.

Some children with ADHD will also show antisocial behaviour, especially aggression. Several epidemiological studies reviewed by Szatmari, Boyle and Offord (1989) indicated that the comorbid rate ranged from 40% to 70%. A recent review by Newcorn and Halperin (2000) indicated that ADHD is a risk factor for the development of conduct disorder. They suggested that the combined use of pharmacotherapy and psychosocial interventions is promising in this regard but awaited further testing in well-controlled clinical trials.

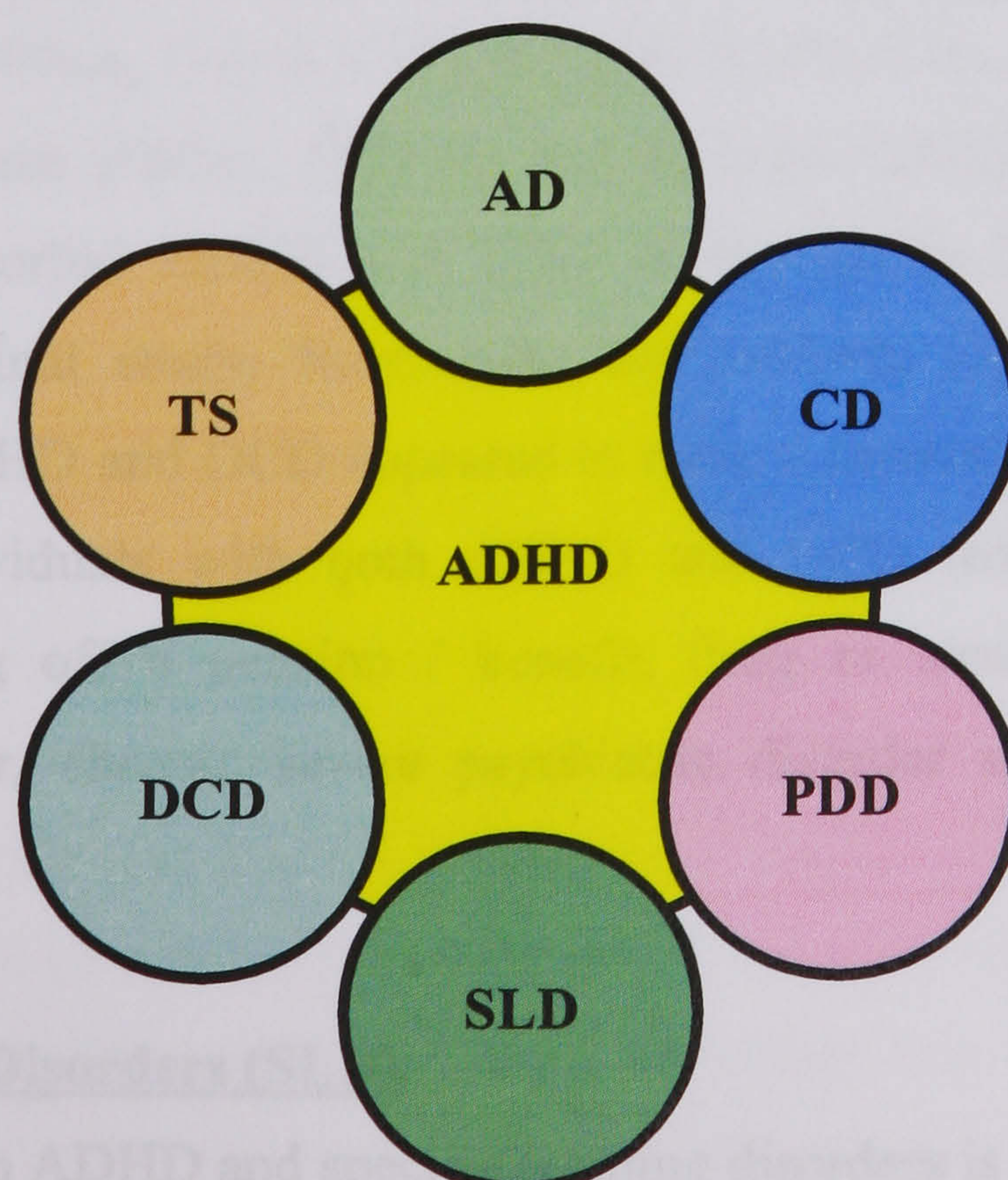
Anxiety/Mood/ Affective Disorders.

The comorbid rate of mood disorders with ADHD is high, and increasingly so with age (Spencer, Wilens, Biederman, Wozniak and Harding-crawford, 2000). For example, Alessi and Magen (1988) reported comorbid attention deficit disorder (ADD) in 28% of children with major depressive disorder and in 22% of those with dysthymia. In adolescents, 60% of those with depression had both disorders (Brumback, Dietz-Schmidt and Weinberg, 1977). For anxiety disorders, it has been estimated that there are about 25% of cases in both epidemiological and clinical samples (Biederman, Newcorn and Sprich, 1991). Tannock (2000) suggested that the association with clinical anxiety might represent a sub-group of ADHD. It may have different etiologies and correlates, be associated with different cognitive styles, and have different responses to treatment.

Figure 2.3: Comorbidity of ADHD with other Developmental Disorders

Keys: CD = **Conduct and Oppositional-Defiant Disorder**
 AD = **Anxiety/Mood/Affective Disorder**
 TS = **Tourette Syndrome**
 DCD = **Developmental Coordination Disorder**
 SLD = **Specific Learning Disorders**
 PDD = **Pervasive Developmental Disorder**

Areas of overlapping are not in proportion.



Obsessive-Compulsive Disorder (OCD).

Toro et al (1992) reported a 6% overlap between OCD and ADHD, while other investigators found overlaps of 10% (Riddle, Scahill and King, 1990), 16% (Hanna, 1995), and 33% (Geller, Biederman, and Griffin, 1996). This variability may be related to methodological and selection differences between the studies. Given these findings, clinicians should ask both parents and their children about OCD symptoms, when screening for the range of disorders that may be comorbid with ADHD.

Tourette Syndrome (TS).

It has been estimated that between 25% to 85% of individuals with Tourette Syndrome have comorbid ADHD (Comings and Comings, 1988). Tourette Syndrome plus ADHD appears to be a more severe condition than ADHD alone (Spencer, Biederman, Harding, O'Donnell, Wilens, Faraone, Coffey and Geller, 1998). The more severe the Tourette Syndrome, the more likely it is that ADHD is also present (Comings, 2000).

Developmental Coordination Disorder (DCD).

Many studies have shown that there is a strong relationship between ADHD and DCD, and other perceptual-motor dysfunctions (ranged from 25% to 65%) (Whitmont and Clark, 1996; Piek, Pitcher and Hay, 1999; Kadesjo and Gillberg, 2001, and Steger, Imhof, Coutts, Gundelfinger, Steinhausen and Brandeis, 2001). In analysing different studies, Gillberg and Kadesjo (2000) concluded that the prevalence of comorbid ADHD and DCD is as high as 50%. In a recently published longitudinal study, Rasmussen and Gillberg (2000) found that the combination of ADHD and DCD appeared to carry a particularly gloomy outlook. For example, individuals with both ADHD and DCD tend to have a higher incidence of living off a pension / benefit, drug or alcohol abuse, a major personality disorder, chronic severe psychiatric disorder and conviction for a crime.

Specific Learning Disorders (SLD).

The overlap between ADHD and specific learning disorders is consistently

reported in the literature (Riccio, Gonzalez and Hynd, 1994). About one quarter of children diagnosed with primary ADHD will have a specific learning disorder affecting reading, spelling, language, or arithmetic skill. Conversely, among 5% - 10% of children who have SLD, about one in three also has ADHD (Tannock and Brown, 2000).

Pervasive Developmental Disorder (PDD)

According to the current diagnostic criteria in the DSM-IV, children with PDD will be excluded in the diagnosis of ADHD. Frazier, Biederman, Bellordre, Garfield, Geller, Coffey and Faraone (2001) challenged this exclusionary criterion and suggested children with PDD with concomitant symptoms of inattention, hyperactivity and impulsivity may have true comorbid ADHD. In recent clinical practice, there are children who have been given a dual diagnosis of PDD and ADHD as both sets of behavioural patterns are equally a hindrance in the child's life.

Summary and Conclusions for the Comorbidity of ADHD with other Developmental Disorders

Accardo (1999) suggested that most children with ADHD are not inaccurately diagnosed but rather incompletely diagnosed as over half of these ADHD children are further influenced by one or more of the associated comorbidities which cause additional psychiatric, neurological and learning problems. He highlighted that the failure to see the association between ADHD and these comorbid conditions remains one of the most frequent causes of misunderstanding and incorrect treatment. He highlighted that the presence of ADHD should be considered as a marker for other developmental or psychiatric conditions.

Occupational therapists are skilful in the identification of different developmental disorders that are commonly comorbid with ADHD e.g. DCD, SLD and PDD. This will make a significant contribution in the processes of differential diagnosis and the identification of comorbidity. Therefore, an occupational therapist should be an essential member of a service or team for children with ADHD.

INTRODUCTION TO THE EVALUATION & INTERVENTION OF ADHD

The evaluation and diagnosis of this complex disorder requires a team approach using a multi-dimensional formulation. The management and treatment of children with ADHD has been a challenge for different medical, psychological, educational and therapy professionals in the last three decades.

Diagnostic Criteria of ADHD

In both Diagnostic and Statistical Manual for Mental Disorders – Edition IV (DSM-IV) and International Classification of Diseases – 10th Edition (ICD-10), specific diagnostic criteria have been proposed. Evaluation procedures need to seek evidence of early age of onset, multiple areas of functioning and adaptation, persistence and pervasiveness across different settings. It is important to include direct observation across situations. Clinicians need to judge whether the level of behavioural problems reaches the status of a “symptom”, and whether the configuration of symptoms constitutes ADHD per se or another disorder. Clinicians need to explore the presenting symptoms; the history of those symptoms; current functioning in a variety of settings; and the presence of other disorders that may be either the principal underlying disorder or a comorbid disorder that affects the child.

Evaluation Protocols and Clinical Guidelines for ADHD

In Europe, clinical guidelines were published on Hyperkinetic Disorder for medical and psychological practitioners (Taylor, Sergeant, Doepfner, Gunning, Overmeyer, Mobius and Eisert, 1998; Overmeyer and Taylor, 1999). It is questionable whether these principles could be applied directly to children with different subtypes of ADHD as Hyperkinetic Disorder is equivalent to only the ADHD-Combined Type.

In the UK, the British Psychological Society (BPS, 1996) proposed a multi-dimensional formulation for ADHD which includes assessment and analysis of environmental factors, neuro-biological factors, individual psychological differences, influence of toxins and diet and the assessment instrument used. This guideline is more appropriate to the practice of a psychologist than occupational therapists as the relationship between the underlying information processing function and functional performance has not been highlighted.

In the USA, the American Academy of Child and Adolescent Psychiatry (AACAP, 1997a and b), the National Institute of Health (NIH, 2000) and the American Academy of Pediatric (AAP, 2000 and 2001) have developed clinical guidelines for the assessment and treatment of individuals with ADHD based on research evidence and also consensus from experts in the USA. These comprehensive guidelines are followed in medical practice within the American healthcare system. They may not be applicable to the health service delivery model in the UK. There is currently no research evidence to support their usefulness outside the USA. Nevertheless, clinicians need to familiarise themselves with the guidance outlined in these protocols.

Although the above guidelines are primarily medically and psychologically based, certain assessment and treatment components are useful for occupational therapy practice e.g. assessment procedures at the behavioural level, psycho-educational programmes for parents, and behavioural management of the child. In order to facilitate the use of these components, occupational therapists need to select and synthesise relevant information appropriate to their particular work settings. The selected components will need to be framed within an occupational therapy model of practice, which should be subjected to further research validation. Once a specific model of occupational therapy practice for children with ADHD is developed, therapists will have research evidence to guide their practice in the process of evaluation and intervention. This will help to establish the specific role of occupational therapy for this group of childhood disorders.

THE PROCESS OF DIAGNOSIS

It is important to note that manifestations of hyperactivity, impulsivity and inattention do not necessarily imply the existence of ADHD. It is important to assess all the possible factors that could contribute to the presenting behavioural pattern. In this instance, the level of etiological factors discussed previously (see Figure 2.3) will be used to guide the level of assessments to be described later. The assessment is most constructive when it involves the child as an active partner in the process (BPS, 1996). According to Whalen and Henker (1996), each child with ADHD has a unique constellation of problems and multiple domains of

functioning may be affected. The assessing team needs to adopt a multi-dimensional assessment approach in order to determine whether or not ADHD is present and how it affects the child's development and performance in different occupations.

Consider Environmental Factors

The environment includes the physical and social settings in which the child operates within a specific cultural background. Children with ADHD typically have different symptoms at different times and in different situations. Clinicians should observe the child in different environments that pose a challenge to the child e.g. nursery, preschool, school etc. Furthermore, in a multi-cultural society, measures of ADHD need to be valid for children with different ethnic backgrounds and must not discriminate against minority groups.

Carry out Formal Assessment by using Different Standardised Tools

There are many different standardised tools that can be used to identify the child's behavioural patterns related to ADHD and also its psychological basis in terms of the level of attention control, inhibitory control, impulsivity and executive functions. Very few standardised tools have been developed to measure the underlying neurological functions of children with ADHD. **Table 2.3** outlines examples of these standardised tools.

At the **behavioural level**, clinicians can use different rating scales and structured questionnaires to measure the child's behavioural pattern related to ADHD. The Connor's Rating Scale is one of the first tools being developed to measure the degree of hyperactivity and also other psychosocial behavioural patterns. It was revised in 1997. However, it does not provide specific measures of the behavioural parameters of ADHD. The ADHD Test, the SNAP Rating Scale and the ADHD Rating Scale are instruments that provide measurements of a child's ADHD behavioural patterns either at home, school or in both settings. The Brown Attention Deficit Disorder Scale goes beyond the behavioural level by incorporating the measurements of executive functions as the psychological basis of ADHD. Although these instruments could provide acceptable means for

quantifying an adult's opinion, they are not sufficient for diagnostic use (Reid and Maag, 1994). Mandal, Olmi and Wilczynski (1999) cautioned their use because of several types of rater errors e.g. children being identified as having ADHD who do not have ADHD, when examined by expert clinicians. Despite these reservations, rating scales could provide markers for further diagnostic evaluation.

Table 2.3: Examples of Standardised Tools designed to measure the Behavioural Pattern, Psychological and Neurological Functions of ADHD

Behavioural Level
<p>Behavioural Pattern Specific and Related to ADHD:-</p> <ul style="list-style-type: none"> • ADHD Test (Gilliam, 1995). • SNAP Rating Scale (Swanson, 1995). • Conners' Rating Scales - revised (Conners, 1997). • ADHD Rating Scale-IV (DuPaul, Power, Anastopoulos and Reid, 1998). • Brown Attention Deficit Disorder Scales (Brown, 2001).
Psychological Level
<p>Attention Control, Inhibitory Control, and Impulsivity:-</p> <ul style="list-style-type: none"> • Test of Variables of Attention (Dupuy and Greenberg, 1993). • Auditory Continuous Performance Test (Keith, 1994) • Intermediate Visual and Auditory Continuous Performance Test (Sandford, Fine and Goldman, 1995). • Gordon Diagnostic System (Gordon, McClure and Aylward, 1996). • Continuous Performance Test – II (Conners, 2001). <p>Executive Functions:-</p> <ul style="list-style-type: none"> • Stroop Colour-Word Interference Test (Golden, 1978). • Wisconsin Card Sorting Test – 64 card version (Kongs, Thompson, Iverson and Heaton, 2000). • Behaviour Rating Inventory of Executive Function (Gioia, Isquith, Guy and Kenworthy, 2000). • Tower of London (Culbertson and Zillmer, 2001).
Neurological Level
<p>Information Processing Functions:-</p> <ul style="list-style-type: none"> • Sensory Profile (Dunn, 1999).

At the **psychological level**, it is important to measure the level of function and dysfunction in the child's attention control, inhibitory control, impulsivity and executive functions as a basis for the presenting behavioural pattern. There are many different tests that have been developed to measure a child's level of sustained auditory and visual attention. For example, the Auditory Continuous Performance Test requires a child to listen to a tape of 15 minutes and respond appropriately to the auditory stimuli provided. The Connor's Continuous Performance Test - II is a computer-based test that is designed to measure a child's sustained visual attention. Both tests also provide measurements on the child's inhibitory control and level of impulsivity.

There are also different tests that can be used to measure a child's executive functions e.g. the Stroop Colour-Word Interference Test, the Wisconsin Card-Sorting Test and the Tower of London. However, not all these tests are specifically developed for children with ADHD. The newly developed Behaviour Rating Inventory of Executive Function does provide specific application to children with ADHD. It has two questionnaires for parents and teachers.

At the **neurological level**, the Sensory Profile developed by Dunn (1999) can be used to assess the sensory modulation function of a child with ADHD. It is a judgment-based caregiver questionnaire and consists of 125 items. Dunn (1999) found that children with ADHD present a profile of lower scores in 43 items distributed in the following 3 Factors and Processing Cluster i.e. Factor 1 – Sensory Seeking, Factor 2 – Emotionally Reactive, Factor 3 – Inattention/Distractibility, and the Visual/Tactile Processing Cluster. Further research by Dunn and Bennett (2002) indicated that children with ADHD differed significantly from children without disabilities in their sensory responsiveness based on the Sensory Profile results. They suggested that the Sensory Profile can contribute to diagnostic and programme planning processes and increase understanding of the nature of the disorder of ADHD.

It is important to note that all these tools were developed in the USA. There are no valid and reliable diagnostic measures of ADHD that have been developed in the

UK. Further research using normative or community-based samples to develop more valid and precise diagnostic tools is essential. Clinicians should be cautious in applying the above assessment tools to children in the UK or other countries outside the USA.

Interview Key Individuals, Direct Observation and Use of General Questionnaires

Greenhill (1998) argues that clinicians should observe the parent and child to evaluate the symptoms of ADHD or comorbid conditions. This includes observing the child's attention, impulsivity and activity level with the parent present and alone with the clinician, and observing the level of compliance during an interaction with the parent. Assessment of the child's view of the world and parents' attitudes to their child and his/her treatment is important if management is ultimately to be effective (Hill and Cameron, 1999). As ADHD represents a dysregulation of behaviour rather than an absolute, constant deficit (i.e. its symptoms fluctuate significantly with respect to different environmental factors), repeated observations or evaluations are necessary in order to obtain a representative portion of the child's typical behaviour and performance. In clinical practice, the use of parents' and teachers' questionnaires can help to gather further information on family background, developmental history and specific behavioural patterns related to ADHD.

Review the Child's Medical File and Use of Information from Other Professionals

Information from other professionals, e.g. an educational psychologist, a teacher etc. is valuable in the overall interpretation of the child's behavioural and functional profiles. Sharing information with other professionals helps to facilitate a team approach, avoid duplication of work and also helps to coordinate an integrated package of care for the child and family.

Make Differential Diagnosis and Identify Comorbid Conditions

It is possible to identify conditions that superficially mimic the clinical features of ADHD (i.e. differential diagnosis). Hill and Cameron (1999) described possible

conditions / circumstances which could mimic ADHD. For example, clinical hyperactivity can be confused with boisterous, exuberant activity within the broad normal range of preschool-aged children. Sleep difficulties and chronic tiredness can be a remediable cause of inattentiveness. Inadequate or chaotic parenting or the lack of an available attachment figure can result in a child who has not learned self-restraint and settled self-occupation. Children with moderate or severe learning disability may have attention and activity levels that are appropriate for their developmental but not chronological age e.g. Fragile-X, Foetal Alcohol Syndrome etc. As the literature shows that over 50% of individuals diagnosed with ADHD also meet the diagnostic criteria for one or more additional psychiatric and developmental disorders, it is important to identify any comorbid conditions which affect the child's functions and performance in different learning, social and daily life activities.

MULTI-FACETED INTERVENTION OF ADHD

Current practice emphasises the use of combined treatment methods. One major study is of the multimodal treatment of children with ADHD (MTA). The MTA is a series of studies conducted by a team of Medical and Psychological professionals in the USA (Richters, Arnold, Jensen, Abikoff, Conners, Greenhill and others, 1999). Recent study (MTA Cooperative Group, 1999) reported that for ADHD symptoms, carefully crafted medication-management approaches are superior to behavioural treatment and to routine community care that includes medication. For non-ADHD areas of functioning (e.g. social skills, academic performance), combined treatment may offer a modest advantage over single-component approaches.

The results of the MTA studies have given rise to a much debate within the field. Pelham (1999) highlighted facets of the design that predisposed the study in favour of a differentially positive outcome for pharmacological relative to behavioural treatment. He pointed out that outcome was measured 4 – 6 months after the intensive phase of behavioural treatment and after therapeutic contact with the behaviour therapist had ended but while medication treatment was active and in its most intensive phase. Carey (2000) argued that the MTA report did not establish

that methylphenidate is a specific remedy for children with ADHD. He pointed out that practically all children, including those with no behaviour problems, function better when they take cerebral stimulants. He also highlighted problems related to the use of vague diagnostic criteria in the DSM-IV and the implementation of behavioural management programmes that are not individualised and sustained. As the MTA study only lasted 14 months, he proposed that a more extended investigation is necessary as it may reveal diminished effectiveness of the medication and increasing value of the behavioural intervention.

It is important to note that the MTA study is mainly focused on three forms of intervention, namely medication treatment, behavioural management and routine community follow-up. In clinical practice, there are many different facets of intervention needing to be examined and explored. From the occupational therapy practice perspective, intervention for children with ADHD emphasises the remediation of underlying neurological dysfunctions, the acquisition of developmental skills, and adaptations to promote functional performance in natural environments e.g. home, nursery, school, and other community settings. The author synthesises information from existing literature and advocates the application of multi-faceted intervention of children with ADHD within a family-centred care approach.

The concept of family-centred care and each facet of intervention will be discussed in detail with support from research evidence and clinical experience. **Table 2.4** summarises the eight components of the multi-faceted intervention model for children with ADHD.

Table 2.4: Multi-Faceted Intervention of Children with ADHD

1. **Education and training** i.e. to promote the understanding of a child with ADHD, and to equip parents/teachers with necessary skills for managing the specific behavioural problems of a child with ADHD.
2. **Environmental adaptation** i.e. to provide advice on adapting and modifying the classroom and home environment in order to promote the child's functioning within these environments e.g. seating position within classroom, calming colour scheme and layout of the child's bedroom, etc.
3. **Behavioural and psychological management** i.e. to develop desirable behaviours by using different positive reinforcement and behaviour reduction strategies, and to treat certain neuropsychological dysfunctions e.g. attention training, impulse control training, and treatment of executive dysfunctions.
4. **Medication treatment** i.e. prescription of appropriate medication to change the brain mechanism responsible for behavioural inhibition, and to monitor the effect and side-effect of medication.
5. **Educational management** i.e. to provide advice to teachers on effective classroom organisation, curriculum modification and performance-promoting strategies.
6. **Social skill training** i.e. to promote the acquisition of appropriate social interactive behaviour by using structured social skills training programme.
7. **Sensory integrative approaches** i.e. to reduce the impacts of different sensory, perceptual and motor dysfunctions which may be the cause of different ADHD features or academic underachievement.
8. **Developmental approaches** i.e. to enhance the child's acquisition of different learning and daily life skills, e.g. handwriting skills, dressing skills, and to advise on the use of compensatory strategies and adaptive devices, e.g. the use of colour coding system in categorising information from different subjects.

Family-Centred Care Approach

In the last twenty years, there has been a shift in the delivering of therapeutic services to children with different disability conditions by establishing parent-therapist partnerships (Humphry, Gonzalez & Taylor, 1993; Lawlor & Mattingly, 1998). Hinojosa, Sproat, Mankhetwit and Anderson (2002) demonstrated that working with parents through a family-centred care approach had the greatest impact on the progress of a child with disabilities. "Family-centred service is

made up of a set of values, attitudes, and approaches to services for children with special needs and their families. Family-centred service recognises that each family is unique; that the family is the constant in the child's life; and that they are the experts on the child's abilities and needs. The family works together with service providers to make informed decisions about the services and supports for the child and family receive. In family-centred service, the strengths and needs of all family members are considered" (King, Teplicky, King and Rosenbaum, 2004, P.79).

It has long been recognised that when a medical condition, disease, or disability challenges a child's development, the ultimate outcome is highly influenced by the caregiving environment (Sameroff & Chandler, 1975). In family-centred intervention, the focus of intervention is guided by the needs of the entire family (Rosenbaum, King, Law, King and Evans, 1998; Humphry & Case-Smith, 2001). When family-centred care guides intervention, therapists support each family member's natural roles to foster effective intervention. In this approach, family members are valued and considered to be equal to the professionals as members of the intervention team (Hinojosa, Bedell, Buchholz, Charles, Shigaki and Bicchieri, 2001).

Occupational therapists recognise the family's position as the expert on the young person. They strive for a collaborative relationship that follows the family's lead and supports its efforts to promote the health and optimal development of its members (Lawlor & Mattingly, 1998). Given the powerful role families play in their children's health, development, and education, it is important that occupational therapists understand how families work (Humphry & Case-Smith, 2001). An occupational therapy family-centred care approach to children and their families embraces 8 basic concepts (Grady, 1989):-

1. Recognising the family as the constant in the child's life.
2. Facilitating collaboration between parents and professionals.
3. Sharing unbiased and complete information with parents.
4. Implementing comprehensive policies and programmes to meet the needs of families.

5. Recognising family strengths and individuality, and respecting their coping strategies.
6. Incorporating the developmental needs of all children and their families into health care delivery systems.
7. Encouraging parents to support one another.
8. Assuring flexible, accessible, and responsive health care delivery systems.

The Neurodevelopmental Clinical Research Unit (NCRU) at McMaster University has developed a three-level framework (see **Table 2.5**) that attempts to incorporate current ideas about family-centred service, and to offer both parent and professional perspectives on the issues (Rosenbaum et al, 1998).

Table 2.5: Premises, Principles and Elements of Family-Centred Care

Premises (basic assumptions)		
<ul style="list-style-type: none"> • Parents know their children best and want the best for their children. 	<ul style="list-style-type: none"> • Families are different and unique 	<ul style="list-style-type: none"> • Optimal child functioning occurs within a supportive family and community context: the child is affected by the stress and coping of other family members.
Guiding Principles (“should” statements)		
<ul style="list-style-type: none"> • Each family should have the opportunity to decide the level of involvement they wish in decision-making for their child. • Parents should have ultimate responsibility for the care of their children. 	<ul style="list-style-type: none"> • Each family and family member should be treated with respect (as individuals). 	<ul style="list-style-type: none"> • The needs of all family members should be considered. • The involvement of all family members should be supported and encouraged.
Elements (key service provider behaviours)		
<ul style="list-style-type: none"> • To encourage parent decision-making • To assist in identifying strengths • To provide information • To assist in identifying needs • To collaborate with parents • To provide accessible services • To share information about the child 	<ul style="list-style-type: none"> • To respect families • To support families • To listen • To provide individualised service • To accept diversity • To believe and trust parents • To communicate clearly 	<ul style="list-style-type: none"> • To consider psychosocial needs of members • To encourage participation of all members • To respect coping styles • To encourage use of community supports • To build on strengths.

Based on these premises, principles and elements of family-centred care, therapists can apply different assessment and treatment procedures within such framework in order to empower and enable parents in the whole intervention processes. For example, there is increasing evidence that formal and informal social support is a powerful resource for families who are raising children with chronic illnesses or developmental differences (Dunst, Trivette & Jodry, 1997). Judge (1998) found an association between actively seeking social support as a coping mechanism and positive family functioning. Occupational therapists working with children and young people with special needs are part of the formal social support system and are in a position to encourage the family's efforts to network among friends, family members, and parent groups. A family-centred approach is demonstrated when the therapist appreciates that the child with special needs is part of an interactive family system and enables the parent to become an equal team member (Brown, Humphry & Taylor, 1997).

Another important aspect of family-centred care is to share with parents unbiased information relating to their child's condition. Research evidence demonstrated that the more parents held informed beliefs about ADHD, the less likely they were to use ineffective discipline and the greater their child's self-esteem (Johnston and Freeman, 2002). Therefore, recognition, assessment and perhaps alteration of parental cognitions (e.g. their self-efficacy, beliefs about the causality of their children's misbehaviour) may be important as we seek to improve clinical service delivery to children with ADHD. Recent research results support the view that interventions for ADHD that aim only at the level of child behaviour are unlikely to alter long-term outcome. It is important to work with and empower parents to support their child (Harrison and Sofronoff, 2002). Therefore, defining and understanding the content and style of care-giving are important strategies for determining how to alleviate or prevent the possible psychosocial difficulties experienced by parents living with a child with ADHD.

Education and Training

Recent research and clinical practice in ADHD has highlighted the importance of psycho-educational programme for parents (Fallone, 1998). In a 12-month

treatment trial, Corkum, Rimer and Schachar (1999) found that parents' knowledge of ADHD and opinions of treatment play a significant role in enrolment in treatments for their children with ADHD. They suggested that providing information to parents regarding ADHD prior to offering treatment modalities could have a favourable impact on treatment enrolment and hence treatment adherence.

Hoza, Owens, Pelham, Swanson, Conners, Hinshaw, Arnold and Kraemer (2000), using data from the Multimodal Treatment Study of ADHD (MTA), examined the relations between parent cognitions and child treatment outcomes. They found that low self-esteem in mothers, low parenting efficacy in fathers, and attributions of child noncompliance to factors controllable by the child all predicted poorer treatment outcomes for the children, even after the specific effects of treatment were controlled. As stated, the more parents held reasonable beliefs about ADHD, the less likely they were to use ineffective discipline. The same principle will also apply to teachers who have a lengthy direct contact time with the child at school.

These research results suggest that a better treatment outcome for children with ADHD could be achieved by improving parents' and teachers' understanding of the condition, and also appropriate management strategies both at home and school. Clinicians can disseminate information related to ADHD to different groups of people e.g. school staff, the general public, and professional groups. Clinical experience suggested that a good structured educational programme could consist of providing reading materials, giving video presentations, talks / seminars, and sharing information through individual case discussion. It is important to reframe the view of the ADHD child from that of a naughty, lazy child who could behave normally if he or she wanted to, to that of a child struggling to deal with a disability outside of his or her complete control.

Environmental Adaptation

An extensive review by Burcham, Carlson and Milich (1993) found that schools in which relatively effective programmes were in place were also strong on organisational and environmental factors which included positive attitudes and

understanding of ADHD, support at authority level, and provision of coordinated intervention through teams of professional workers. The child's environment must be examined for its capacity to provide safety, support, space, and facilities for functional performance. There is hardly any research examining the change in the behavioural pattern of a child with ADHD when environmental factors are manipulated. Based on clinical experience, therapists should consider the adaptation of different sensory/physical characteristics, and organisational features of the environment as part of the treatment programmes. For example, a predictive schedule is essential to help the child to regulate his/her behaviour. A visual display of the daily schedule and regular briefing from the teacher could be used.

Behavioural and Psychological Management of ADHD

Fiore, Becker and Nero (1993) reviewed 150 intervention studies focused mainly on behaviour management and self-control. Based on a qualitative analysis, they identified that the use of positive reinforcement, behaviour reduction strategies, and response cost are effective in making changes. These strategies appeared to result in reduced activity, increased "time on task" and improved academic performance. Another systematic review by Pelham and Gnagy (1999) also confirmed that psychosocial treatments for ADHD are effective. Information generated from these research studies on psychosocial treatment has been adopted by different researchers and clinicians in their work on children with ADHD. One of the renowned researchers/authors/clinicians is Dr. Russell Barkley, Director of Psychology and Professor of Psychiatry and Neurology at the University of Massachusetts Medical Centre.

Barkley (1998a) highlighted that the ADHD child is not suffering from a lack of skill or knowledge, so showing the child how to do something to correct his or her problems will not be of much help. Instead it will be more effective to give clear instructions, rearrange work so it is more interesting and motivating, redirect the child's behaviour toward future goals versus immediate gratification, and provide immediate rewards for a completed task or adherence to rules. One example is the use of response cost which involves the loss of a reinforcer (e.g. a wide range of privileges and activities) contingent upon inappropriate behaviour. Response cost

has often been used to manage the disruptive behaviour of ADHD children in the context of a token programme. It involves the child losing tokens for inappropriate behaviour in addition to earning them for appropriate behaviour. It has been used in a variety of programmes and proved to be effective (Kelly and McCain, 1995; Barkley, Shelton, Crosswait, Moorehouse, Fletcher, Barrett, Jenkins and Metevia, 1996). McGoey and DuPaul (2000) maintained that the use of token reinforcement and response cost procedures is effective in reducing disruptive behaviour in preschool children with ADHD. This application of behavioural principles is consistent with the view of Goldstein and Ingersoll (1993) that the effective treatments for ADHD are those in place in natural settings at the “point of performance”, where the desired behaviour is to occur.

Based on over 20 years of clinical experience and different research findings, Barkley identified 10 Guiding Principles (Barkley, 1995) for raising a child with ADHD (see **Table 2.6**). These 10 principles highlight the specific needs of children with ADHD in terms of behavioural management i.e. they need immediate, frequent and powerful consequences to establish and maintain desirable behaviour. These principles relate to the understanding that children with ADHD are not suffering from a lack of skill but lack of self-control. Therefore management strategies based on these behavioural principles by providing input at the “point of performance” will have a stronger impact on the child’s behaviour.

Different management strategies have been devised based on these principles. For example, one means of doing this is to have parents place small stickers with smiley faces on them around the house in locations where they frequently look. Whenever a parent sights a sticker, he or she is to comment on something positive that the ADHD child is doing at the very moment. Another way to achieve this goal for parents might involve simply setting a vibrating timer at brief and varied intervals throughout the day. When it vibrates, it is a reminder to the parents to let their ADHD child know how he or she is doing. Although these 10 behavioural principles have been used in clinical practice, there are no research studies to examine their effectiveness.

Table 2.6: Barkley's Ten Principle-Centred Parental Strategies

1. **Use more immediate feedback and consequences.** ADHD children require much more frequent and immediate feedback or consequences about their prosocial and acceptable behaviour.
2. **Use more frequent feedback and consequences.** ADHD children need feedback and consequences that are not just swift but also frequent.
3. **Use large and more powerful consequences.** Since ADHD may involve reduced sensitivity to rewards, larger, more important or salient rewards may have to be used with ADHD children.
4. **Use incentive before punishment.** Parents must be frequently reminded of the rule "positives before negatives" in instituting behaviour-change programmes.
5. **Strive for consistency and persistence.** Important strategies are being consistent over time, not giving up too soon when just starting a behavioural programme, responding in the same fashion even when the setting changes, and making sure that both parents are using the same methods.
6. **Act immediately and avoid discussions.** ADHD children are much more sensitive to the consequences and feedback and much less sensitive to reasoning than non-ADHD children. To keep talking will incur aggravation, not compliance. So act quickly and act frequently, and the ADHD child will behave better.
7. **Plan ahead for problem situations.** Parents need to anticipate problems, consider ahead of time how best to deal with them, develop their plan, share it with the child, and then use the plan should a problem arise.
8. **Keep a disability perspective.** Remind parents that they are dealing with a "disabled" child. Advise them to stay calm if possible and maintain a sense of humour about the problem. Provide information on local parents' support groups or the national association.
9. **Don't personalise the child's problems or disorder.** Advise parents not to allow their own sense of self-worth and personal dignity to become wrapped up in whether or not they "win" an argument or encounter with the child.
10. **Practise forgiveness.** At the end of each day, parents should take a moment to review the day and forgive the children for their bad behaviour, forgive others who may have acted in ways offensive to them and their children, and forgive themselves for their own mistakes in the management of their children that day.

Medication Treatment of ADHD

There are four types of medication used for individuals with ADHD i.e. psycho-stimulant, anti-depressant, anti-psychotic and anti-hypertensive medications (Pliszka, Greenhill, Crismon, Sedillo, Carlson, Conners, McCracken, Swanson, Hughes, Llana, Lopez and Toprac, 2000a & b). Psycho-stimulants (e.g. Ritalin) are the most widely used. In the UK, they are not recommended for children less than 6 years of age (NICE, 2000). Recently, a type of sustained release psycho-stimulants (Concerta) has become available in the UK (Ford, Taylor and Rogers, 2000). This longer acting stimulant may help to solve the problem of midday doses at school, minimise the “on/off” therapeutic effects and also side effects sometimes seen with multiple doses slow release Ritalin (Kewley and Marshall, 2001). Parents should be well informed on the effects and side effects of medication in order to help them to make the decision.

The use of medication can be highly effective for some children with ADHD. Studies have shown a 70% to 75% probability of improvement in using medication treatment (Cohen, 1998). If parents understand the different choices of medication, potential side effects, and the need for appropriate monitoring, they could become important partners in making informed treatment decisions. In the UK, Taylor and Hemsley (1995) advocated that medication must not become the first, and definitely not the only, line of treatment i.e. a diagnosis of ADHD should not constitute a recommendation of automatic drug treatment. This has been translated into the clinical guidelines for hyperkinetic disorder (Taylor et al, 1998) and ADHD (Jouglin and Zwi, 1999), according to which the first line of treatment should be counselling the parents, implementing behavioural management, and also the use of educational management with the teacher.

In response to the complex issue of prescribing psycho-stimulants, two clinical guidelines have been published in the UK: FOCUS on The Use of Stimulant in Children with ADHD (Jouglin & Zwi, Royal College of Psychiatrists, 1999), and Guidance on the Use of Methylphenidate (Ritalin, Equasym) for ADHD in Childhood (NICE, 2000). Both guidelines provide appraisal of research evidence in the use of psycho-stimulants for children with ADHD. The FOCUS publication outlines in-depth analysis of different questions related to the prescription of

stimulants to children of different ages, gender and with different comorbid conditions. There is also a protocol for a trial and monitoring of medication. In the NICE guideline, the number of ADHD children who will benefit from medication treatment is estimated to be around 72,2000 in England and Wales. It advocates a shared care arrangement between specialists and general practitioners in the prescribing and monitoring of psycho-stimulant medication.

Educational Management of ADHD

ADHD places children at serious educational risk, as the disorder is most prominent in day-to-day adaptive functioning in the classroom and social domains. When ADHD symptoms adversely affect academic performance and success, educational accommodations will be necessary. Zentall (1993) advocated an increase of active participation, the use of verbal as opposed to written response, focus on the novelty of tasks and self-pacing, and also a reduction in the amount of “seat work” required in order to maximise positive outcomes. Mulligan (2001), based on a survey of general education teachers in northern New England, recommended the strategies of increasing individual support in the classroom, smaller class sizes, frequent parent-teacher collaboration, and more hands-on learning experiences. This is consistent with the results of a meta-analysis carried out by DuPaul and Eckert (1997). They reviewed 63 classroom intervention studies for ADHD with more than 600 participants and concluded that classroom behavioural interventions have well-documented effects and substantial effect size with ADHD children.

Social Skill Training for Children with ADHD

ADHD children are frequently bothersome and socially awkward. They are socially “busy” and their high social activity level puts them at-risk for negative interpersonal experience (Landau and Moore, 1991). They are also socially salient and intense, and their high level of vigour is typically inappropriate in social situations (Wheeler and Carlson, 1994). Guevremont (1993) suggested that about half of children with ADHD have peer-relationship problems. He proposed that the goals of social-skills training should aim at providing successful peer contacts, increasing knowledge about appropriate behaviour and adaptive social skills,

promoting successful peer interactions in the natural environment, and altering the child's social status within the peer group. Sheridan, Dee, Morgan, McCormick, and Walker (1996) described a multimethod intervention for social skill deficits in children with ADHD and their parents. The child-based intervention comprised of 10 weekly sessions focusing on target skills in the areas of social entry, maintaining interactions and solving problems. A parent group met separately but simultaneously with the children's group to teach parents skills to help their children with their social problems. Parents were taught the skills of debriefing, problem solving, and goal setting. At the end of the programme, all children reported improvement of at least one standard deviation on self-report social skill rating scales. Reports from parents and teachers also suggested general improvement for most children. This multimethod intervention proves to be a good model for implementing social skill training programmes.

Sensory Integrative Approaches in the Treatment of ADHD

Cermak (1988a & b) hypothesised the Reticular Activating System, at the level of the brain stem, as a source of the dysfunction related to children with ADHD. She proposed a model to relate dysfunctions in the continuum of sensory modulation to deficits in the continuum of arousal and the continuum of attention. This hypothesis is supported by the findings of a recent research studies on the relationship between sensory modulation dysfunction and ADHD (Mangeot et al, 2001; Dunn and Bennett, 2002). Currently, there are very few published research studies examining the efficacy of sensory integrative therapy for children with ADHD.

Based on clinical experience and the framework in the practice of sensory integrative therapy (Bundy et al, 2002), the treatment of ADHD by using a sensory integrative approach could fall into four categories:-

1. Promote the awareness and understanding of the child's underlying sensory processing dysfunction and its effect on the child's development and behaviour, e.g. through seminars or individual case discussion. Children's strategies often push away the very things that would help them to develop

appropriate skills. It is the therapist's responsibility to educate families and teachers about the danger of indiscriminately providing sensory input. This may further compromise the child's vulnerable Central Nervous System and further affect his or her development (Oetter, 1986a).

2. Modify the natural environment in order to promote the child's level of adaptive behaviour, e.g. consider the sensory and physical characteristics, daily routine of activities, and organisational features of the environment. Intervention emphasises the importance of collaborative work with parents and teachers, and modification of the environment to grade children's sensory experiences. The goal is to attain a goodness-of-fit between the sensory-related demands of the physical and social environments and the child's sensory needs.
3. Integrate planned and scheduled sensory activity programme into the child's natural environment in order to meet his/her specific sensory needs e.g. the use of the concept of sensory diet (Wilbarger, 1995) by applying different sensory calming and/or alerting techniques to regulate the child's arousal level for better attention control. A well-balanced sensory diet can facilitate the achievement of a good fit (Williamson and Anzalone, 2001).
4. Implement direct hands-on treatment programmes either individually or in a small group by using different therapeutic programmes e.g. the classical non-directive and child-centred treatment developed by Ayres (1972 & 1979), the MORE Programme (Oetter, Richter and Frick, 1995), the Alert Programme (Williams and Shellenberger, 1994), and the Therapeutic Listening Programme (Frick and Hacker, 2000).

Occupational therapists' knowledge base in sensory modulation dysfunction provides a theory-based understanding of children with ADHD, the vulnerability of their nervous systems, and their desperate attempts to develop positive relationships and organised behaviour with inconsistent results. Although there is no research study directly examining the efficacy of sensory integrative therapy for children with ADHD, outcomes from clinical practice support the claim that it is

an effective treatment. The clinical effectiveness is more obvious when it is combined with other facets of intervention e.g. psychoeducational programme for parents and teachers, behavioural and classroom management strategies based on Barkley's 10 principles, and also modification of classroom environment. In order to validate clinical experience, it is important to carry out scientific research to evaluate the efficacy of a care package based on this clinical observation.

Developmental Approaches to the Treatment of ADHD

Children with ADHD present a range of developmental problems in the areas of motor functions, perceptual and cognitive functions, speech and language functions, academic learning and handwriting skills (Barkley, 1998c; Whitmont and Clark, 1996 & Piek et al, 1999). **Table 2.7** summarises the range of associated developmental problems reported in different research studies (Barkley, 1998c; Whitmont and Clark, 1996 & Piek et al, 1999).

Table 2.7: Associated Developmental Problems in Children with ADHD

Perceptual and Cognitive Dysfunctions

- poor sense of time
- impaired planning ability
- decreased nonverbal and verbal working memory
- mild deficits in intelligence
- deficient academic achievement skills e.g. reading (8 – 39%), spelling (12 – 26%), math (12 - 33%), and handwriting (common, but unstudied).

Language Impairments

- delayed onset of language (up to 35% but not consistent)
- speech impairments (10 – 54%)
- poor organisation and inefficient expression of ideas
- impaired verbal problem solving
- coexistence of central auditory processing disorder (minority but still uncertain).

Adaptive Functions

- 10 – 30 standard score points behind normal in self-care skills, personal responsibility and independence in daily activities.

Motor Skill Deficits

- delayed motor coordination (up to 52%)
- more neurological “soft” signs related to motor coordination and overflow movements, and sluggish gross motor movements.
- poor kinaesthetic acuity.
- children with ADHD- Combined Type were found to experience significantly greater difficulty with gross motor skills.
- children with the Inattentive Type had significantly poorer fine motor skills

Developmental approaches follow the assumption that children follow orderly, predictable patterns of development, while atypical development is the result of some unusual occurrence, such as disabling condition or severe social stress (Cronin, 1996). Clinicians can assess a child's current strengths and weaknesses in order to anticipate difficulties as the child progresses through life. If any developmental problems are identified during the course of evaluation, the clinician should select appropriate treatment methods to help the child acquire appropriate developmental functions and skills e.g. developmental therapy, perceptual-motor approaches, functional skill training etc. It is important to note that not all ADHD children display all these developmental problems listed in Table 2.7. They are considered associated features as they are not diagnostic of the disorder when present, nor do they rule out the diagnosis when absent (Barkley, 1998a).

Within occupational therapy practice, the assessment and treatment of motor skills are the common domain of concern related to the child's functional performance. In reviewing the current literature, children with ADHD present a spectrum of motor deficits. Whitmont and Clark (1996) assessed the kinaesthetic acuity and fine motor skills in 24 9-year-old children with ADHD. Compared with the control group, children with ADHD showed significantly poorer performance on both tasks, but only a weak association between fine motor and kinaesthetic performance. Piek et al (1999) compared the motor skills and kinaesthetic processes of 16 boys with ADHD (predominantly inattentive type – ADHD-PI and combined type – ADHD-C) with a group of 16 control boys matched on age and verbal IQ. The findings demonstrated that children with ADHD had significantly poorer movement ability than the control children in the Movement Assessment Battery for Children. A high percentage of children with ADHD displayed movement difficulties consistent with Developmental Coordination Disorder (DCD). Children with ADHD-C were found to experience significantly greater difficulty with gross motor skills, while children with ADHD-PI had significantly poorer fine motor skills. Kinaesthetic sensitivity was not found to differ significantly between the groups. They concluded that the severity of the

children's inattentive symptomatology was found to be a significant predictor of motor coordination difficulties. Gillberg and Kadesjo (2000) concluded that the prevalence of comorbid ADHD and DCD is as high as 50%. Therefore, it is important to routinely screen or assess the motor functions of children with ADHD in order to identify any comorbid Developmental Coordination Disorders.

Developmental approaches can be used to determine stage and age-appropriate behaviour expectations and can be used as a guide to direct intervention. Children with delays in acquiring functional skills can be directed toward an age-appropriate skills level. Rappaport, Ornoy and Tenenbaum (1998) found that early intervention by non-pharmacologic means (occupational therapy and/or speech therapy) can decrease the incidence of ADHD in a group of preschool children with a family history of ADHD. Therefore, it is important to treat any developmental problems identified in children with ADHD in order to improve the outcome of their adjustment to life.

Summary and Conclusion for the Multi-Faceted Intervention of ADHD

It is important to note that no treatment has yet been proved to cure the condition of ADHD, nor are any enduring effects present in children if treatment is withdrawn. As a result, many professionals are now moving to the view that ADHD is a developmental disability, requiring long-term symptomatic treatment (Barkley, 1998a). So far, the only empirically validated treatments for children with ADHD with substantial research evidence include psycho-stimulant medication, and behavioural and educational management (DuPaul and Barkley, 1993 and Richters et al, 1999). The other components of multi-faceted intervention need further research to establish their efficacy though some preliminary evidence is available. Although current research on the value of combined intervention is not conclusive, Goldstein and Goldstein (1998) noted that over the short term, a combination of treatments provides greater symptom relief and therapeutic gains than the use of any single approach.

Therefore, it will be useful to expand the options by developing different combined treatments and by validating the effectiveness by using different outcome studies.

From the occupational therapy perspective, integrating sensory integrative approaches with psycho-educational programmes for parents and teachers, behavioural and classroom management, and also treatment of associated developmental problems proved to be a good form of combined treatment clinically. However, these clinical observations and experiences need to be supported by scientific research. Therefore, further research is necessary to establish which combination of interventions is more effective for a particular situation.

Conners (2000) highlighted that comparative group studies of treatments do not help clinicians adapt treatments to particular children under particular conditions. Research must be done to determine how best to fit treatments to a particular child. Because of the lack of consistent improvement beyond the core symptoms and the paucity of long-term studies (beyond 14 months), there is a need for longer term studies. It is also important to look into the mechanism of an effective team approach. Sloan, Jensen and Kettle (1999) expressed serious concerns over the minimal integration of disciplines in the delivery of comprehensive, multi-faceted treatments.

CRITICAL ANALYSIS OF RESEARCH INFORMATION PERTAINING TO OCCUPATIONAL THERAPY PRACTICE

Occupational Therapy for Children with ADHD

In the UK, occupational therapy for children with ADHD is a relatively new field. There is no information on the role of occupational therapy or the extent of involvement of children with ADHD. Further research is necessary to explore the current practice of occupational therapy in the assessment and treatment of children with ADHD in the UK in order to establish the specific role of occupational therapy. As training in the management of children with ADHD is not usually included in the under-graduate programme in occupational therapy courses, it is important to identify the training needs of therapists practising in the paediatric field. Information gathered will be useful to develop a model of practice in occupational therapy for children with ADHD.

Consensus Development on the Role of Occupational Therapy for Children with ADHD

There are published clinical guidelines for medical and psychological professionals in the assessment and treatment of children with ADHD. Although these guidelines are primarily medically and psychologically based, certain assessment and treatment components are useful for occupational therapy practice e.g. assessment procedures at the behavioural level, psycho-educational programmes for parents, and behavioural management of the child. In order to facilitate the use of these components, occupational therapists need to select and synthesise relevant information appropriate to their particular work settings. This could be achieved by conducting consensus development research on the role of occupational therapy. The selected components will need to be framed within an occupational therapy model of practice, which should be subjected to further research validation e.g. outcome evaluation of an occupational therapy care package for children with ADHD. Once a specific model of occupational therapy practice for children with ADHD is developed and validated, therapists will have research evidence to guide their practice in the process of evaluation and intervention. It will help to establish the specific role of occupational therapy for this group of childhood disorders.

Family-Centred Care Approach

Occupational therapists recognise that the ultimate outcome of a child's development is highly influenced by the caregiving environment (Hinojosa et al, 2002). They strive for a collaborative relationship with parents and appreciate that the child with ADHD is part of an interactive family system (Lawlor and Mattingly, 1998). Occupational therapists working with children and young people with special needs are part of the formal social support system and are in a position to encourage the family's efforts to network among friends, family members, and parent groups (Judge, 1998). A family-centred approach is demonstrated when the therapist enables the parent to become an equal team member (Brown, Humphry & Taylor, 1997). DeGrace (2003) recommended that for occupational therapy practice to be family-centred it was necessary to evaluate and address the range of occupations engaged in by all family members. When

applying these principles in the management of children with ADHD, all the assessment and treatment procedures adopted should be framed within a family-centred care approach.

Model of Multi-Dimensional Evaluation

Each child with ADHD has a unique constellation of problems and multiple domains of functioning may be affected. Therefore, it is important to adopt a multi-dimensional assessment approach in order to determine whether or not an ADHD is present and how it affects the child's development and performance in different areas of functions.

In reviewing the literature, there is a lack of coherence and no unified view about the causes of ADHD. As a result, different disciplines tend to focus on different etiological factors of ADHD and advocate different assessment and treatment methods. In order to form the theoretical arguments for reliable evaluation procedures and effective intervention outcomes within occupational therapy practice, the author formulates a model to highlight the interaction between the child and the environment at different levels of functions (i.e. neurological, psychological and behavioural) by synthesising different research evidence (see Figure 2.2). For example, we need assessment tools to evaluate the primary behavioural features pertaining to ADHD and also tools to identify different neurological and psychological correlates for the presenting behavioural patterns. This model will be used to guide occupational therapists in implementing a multi-dimensional evaluation protocol and multi-faceted intervention programme.

Another area of assessment needing to be explored is the level of participation in different occupations by the child and other family members. Currently, there is no study in this area of assessment related to children with ADHD. Occupation-based assessment for children is one of the main domains of concern in occupational therapy practice (Coster, 1998). This issue will be discussed and addressed in Chapter Six in the formulation of the model of practice.

Review of different literature concluded that over half of children with ADHD are influenced by one or more of the associated comorbidities which cause additional psychiatric, neurological and learning problems. Accardo (1999) highlighted that the failure to see the association between ADHD and these comorbid conditions remains one of the most frequent causes of misunderstanding and incorrect treatment. Occupational therapists are skilful in the identification of different developmental disorders that commonly comorbid with ADHD e.g. DCD, SLD and PDD. Therefore, occupational therapy evaluation should be an essential component in the processes of differential diagnosis and the identification of comorbidity in children with ADHD.

The Evaluation of Sensory Processing Function as Part of the Multi-Dimensional Evaluation

Review of recent literature supported that there are relationships between sensory modulation dysfunction and ADHD. Children with ADHD differ significantly from children without disabilities in their sensory responsiveness based on the results of the Sensory Profile. Therefore, occupational therapists could use the Sensory Profile to make contributions to the diagnostic and treatment planning processes of children with ADHD.

Although there is no published research study examining the efficacy of sensory integrative therapy for children with ADHD, outcomes from the author's clinical practice support the claim that it is an effective treatment. When combining sensory integrative therapy with other facets of intervention e.g. psychoeducational programmes for parents and teachers, behavioural and classroom management strategies, and also the modification of classroom environments, the clinical effectiveness is more obvious. It is important to carry out scientific research to validate this clinical experience by evaluating the efficacy of a care package based on this clinical observation.

Model of Multi-Faceted Intervention

In order to remediate the "roots" of the disorder, a model of multi-faceted intervention is essential to address different levels and aspects of the disorder. So

far, no treatment has yet been proved to cure the condition of ADHD. The only empirically validated intervention for children with ADHD is the combined treatment of psycho-stimulant medication, and behavioural and educational management. It provides greater symptom relief and therapeutic gains than the use of any single approach.

At present, most formats of evaluation and intervention procedures are predominantly medically and psychologically based. It will be useful to expand the options of different combined treatment methods by integrating therapeutic methods used in occupational therapy and other psychological and behavioural approaches. The goal of intervention will focus on improving the child's functional performance in different tasks and also successful participation in different occupations appropriate to the child's level of development and environmental demands. However, scientific research studies will need to be carried out in order to measure the efficacy of these new combined treatment methods e.g. outcome evaluation of an occupational therapy care package with combination of treatments for children with ADHD.

CONCLUSIONS

ADHD is a category of neuropsychiatric disorder first established in the USA. The DSM-IV diagnostic criteria of ADHD have made it a broad, inclusive and heterogeneous grouping of children presenting different patterns of overactivity, impulsiveness and/or inattention. European practice adopts the ICD-10 category of Hyperkinetic Disorder (HD) which has more stringent parameters and lower prevalence (BPS, 1996).

The literature review has highlighted the emerging new understanding of ADHD as complex, multifaceted clusters of dimensional impairments in neurological, psychological, and behavioural levels. Although this understanding is emerging, it is not fully developed and established. Controversy still exists as to the nature of the concept, its operational definition, etiology, and treatment practices (Conners, 2000). Brown (2000) pointed out that the research base for different proposed

models of ADHD is still fragmentary and suggestive, not complete or definitive. Much work, both theoretical and empirical, remains to be done to conceptualise, assess, and treat these clusters of impairments currently known as ADHD. Considering the historical perspective described, ADHD should be viewed as a changing and evolving concept.

The collaboration between medical, therapy, psychological and educational professionals is particularly important in the overall evaluation and intervention of children with ADHD. Multi-dimensional evaluation could help to confirm or refute the diagnosis of ADHD, identify comorbid conditions, and ascertain the child's level of functioning in different areas of development. Multi-faceted treatment is advocated to cover different aspects of the disorder. Further research studies will need to be carried out in order to validate the theory and the construct of ADHD, to develop valid and reliable evaluation tools, to develop guidelines in making differential diagnosis, to delineate different phenotypes and comorbid conditions, and to evaluate the efficacy of different treatment methods.

It is important to note that no existing therapy permanently corrects the underlying problems in the brain that seems to give rise to ADHD. Even when treatment of children with ADHD is successful at a specific period of time, it is critical to remember that they still retain their underlying neurological deficiency. This means that they are prone to relapses and their symptoms may not be as easily managed or controlled as they have been at other times. Therefore, it is important to view ADHD as a developmental disability which requires long-term symptomatic treatment (Barkley, 1998a).

The role of occupational therapy in facilitating engagement in meaningful tasks and successful participation in different occupations can be broadened to this new area of practice. In order to establish the specific role of occupational therapy for children with ADHD, a model of practice should be developed by setting the following objectives within this PhD study:-

1. To carry out an ongoing literature review of the aetiology, theory, assessment and treatment of ADHD, especially in identifying knowledge which could be integrated into occupational therapy practice.
2. To study the components and processes involved in constructing a model of practice.
3. To carry out a national survey research in order to explore the current practice of occupational therapists in the assessment and treatment of children with ADHD and also to identify training needs.
4. To develop a preliminary model of practice based on research evidence, the author's clinical experience and also information gathered through the national survey.
5. To achieve consensus on the components of the preliminary model of practice through a clinical forum in order to develop the role of occupational therapy for children with ADHD.
6. To refine the preliminary model of practice based on the results of the consensus development. A family-centred occupational therapy care package will be formulated with a written protocol of evaluation and intervention for children with ADHD.
7. To conduct a multi-centred efficacy study to validate the formulated care package based on the developed model of practice. Research methods on process and outcome evaluation will be used to measure the efficacy of a family-centred occupational therapy care package for children with ADHD.

Chapter 3 will outline the design of the whole study in more detail. A schematic figure will be used to illustrate the stage of the research development in relationship to the time scale of the study.

Chapter Three

Design of the Study

“Scientists seek answers to their own questions. Their work is built on highly refined skills in asking and answering questions: Knowing how to ask questions is as important as knowing how to go about answering them. The essence of science is the process of carefully composing questions and then systematically seeking their answers to gain a better understanding of nature. Science involves a process of inquiry, a particular way of thinking.”

(Graziano and Raulin, 1989, p.2)

INTRODUCTION

The research presented here will focus on developing a delineation model of occupational therapy evaluation and intervention by firstly integrating evidence from existing research studies and subsequently collating data gathered at different stages of the author's empirical research. It is important to note that as research is based on an open system of thought (Phillips and Pugh, 1993), there has been a continual refinement of the research processes.

RESEARCH DESIGN

The whole study consists of three distinctive stages: exploration, formulation and validation. Different research studies and development work were carried out in each stage in order to collect relevant data and clinical evidence to formulate a model of practice. The following is a brief description of each stage:

Stage 1 (Exploration)

This stage aims at exploring the existing practice of occupational therapists for children with ADHD in the UK.

Research Questions:-

1. What is the percentage of practising paediatric occupational therapists having direct involvement in services for children with ADHD, and at what level of involvement?
2. For those who have direct involvement, what is the nature of involvement in the process of assessment and treatment?
3. What are the reasons for non-involvement in the management of children with ADHD?
4. How do paediatric occupational therapists perceive their level of knowledge about ADHD, the means of acquiring knowledge, and gaps in knowledge?

Research Objectives:-

A national survey research has been carried out by using a field-tested

questionnaire circulated to all members of the National Association of Paediatric Occupational Therapists (NAPOT), i.e. over 900 therapists. The primary objectives of the national survey were:

1. To investigate the level of involvement of paediatric occupational therapists in the management of children with ADHD.
2. To gather information about the nature of involvement in the processes of assessment and treatment of children with ADHD within different service settings.
3. To identify therapists' existing levels of and gaps in knowledge and the preferred modes of post-graduate training.

Stage 2 (Formulation)

In this stage, the proposed role of occupational therapy for children with ADHD was formulated based on research evidence, clinical experience and also information gathered through the national survey. In order to achieve consensus on the role of occupational therapy, a consensus development research method was used, based on the conceptual model developed by Murphy, Black, Lamping, McKee, Sanderson, Askham and Marteau (1998), and with the following research questions and objectives:

Research Questions:-

1. How do occupational therapists perceive their role in the assessment and diagnosis of children with ADHD?
2. What core areas of multi-faceted intervention could be carried out by occupational therapists in the management of children with ADHD?
3. Do occupational therapists perceive themselves to have a role to play in the areas of education/training of parents, teachers, and other professionals?
4. Should occupational therapists be involved in different areas of research in ADHD?

Research Objectives:-

1. To achieve consensus on the role of occupational therapy for children with ADHD.
2. To use information generated to contribute to the development of a model of practice and also a family-centred occupational therapy care package with written protocol of evaluation and intervention for children with ADHD.

Stage 3 (Validation)

A multi-centred outcome study has been used to validate the formulated family-centred occupational therapy care package. Twenty occupational therapists from the four countries in the UK were trained to implement the care package and collect data to measure the outcomes. There were two principal research questions and objectives:

Research Questions:-

1. Does a family-centred care approach produce positive parental perceptions of the care they and their children received?
2. Is a defined family-centred occupational therapy care package carried out over 3 months effective in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD?

Research Objectives:-

1. To measure the parents' perceptions of the care they and their children received from the case occupational therapist through the implementation of a defined family-centred occupational therapy care package.
2. To measure the outcome of a defined family-centred occupational therapy care package carried out over 3 months for children aged between 5 to 10 years old with ADHD.

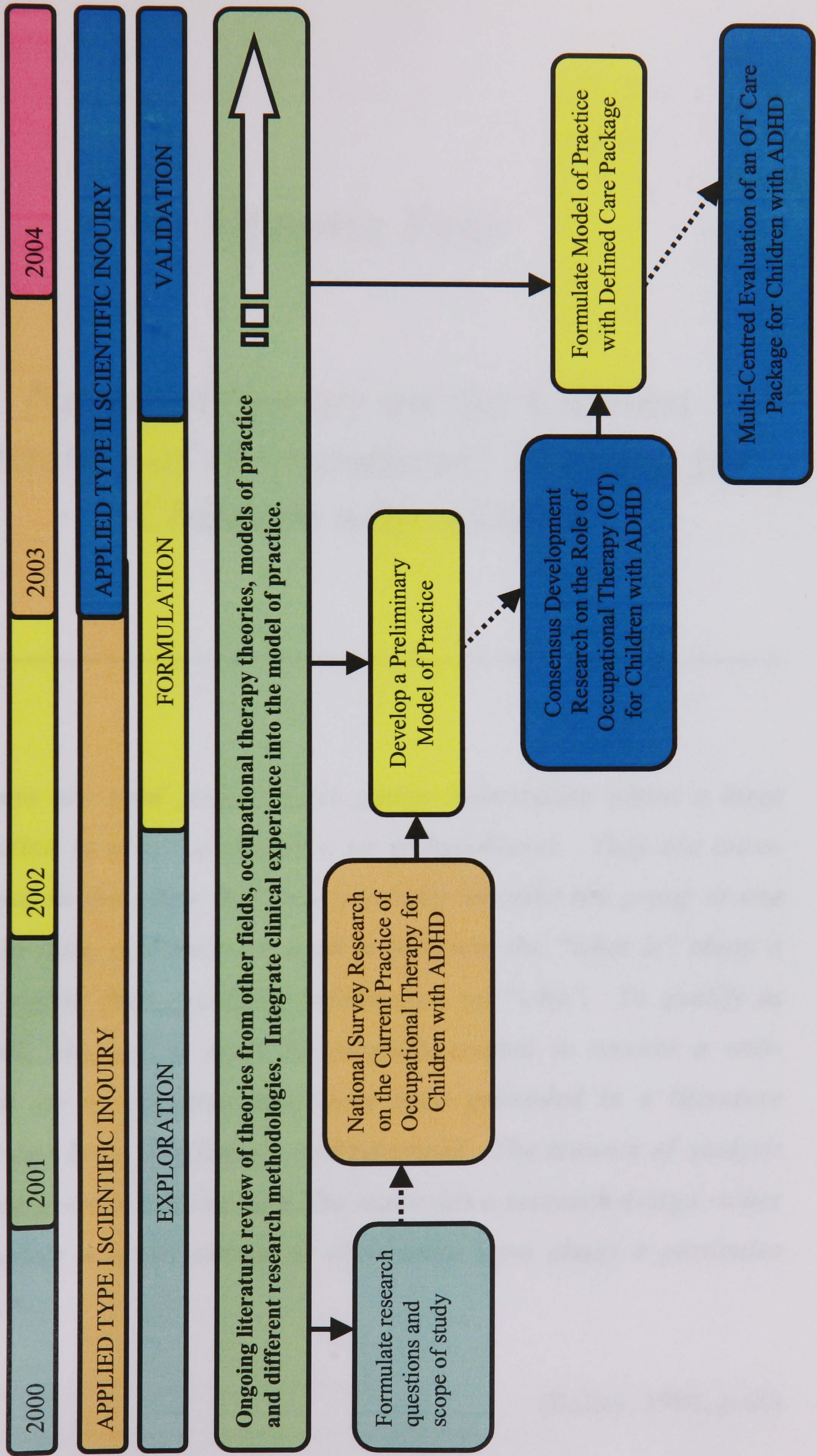
The above summarises the overall plan of the whole study. **Figure 3.1** provides a schematic illustration of the stage of development in relation to the time scale of the study.

**APPROVAL FROM RESEARCH ETHICS COMMITTEES AND
RESEARCH MANAGEMENT AND GOVERNANCE COMMITTEES**

Approval has been obtained from:

1. The Ethics Committee of the Department of Health Sciences and Social Care, Brunel University.
2. The West Midland Multi-centred Research Ethics Committee

Figure 3.1: Processes of the Study



Chapter Four

National Survey on the Current Practice of Occupational Therapy for Children with ADHD

“Surveys are used frequently to gather information about a large population in order to answer a set of hypotheses. They are cross-sectional in the sense that they generally describe the group at one point in time, and they are used to measure the “what is” about a group rather than providing information on “why”. To qualify as research, the survey must be carefully crafted to answer a well-defined set of questions that have been grounded in a literature review and have significance and relevance. The manner of analysis and interpretation of the data also make this a research design rather than solely a status survey to elicit some facts about a particular group.”

(Bailey, 1991, p.60)

INTRODUCTION

Review of current literature indicated that there are very few publications on the role of occupational therapy for children with ADHD. However, that does not mean that occupational therapy has no role to play in the assessment and treatment of children with ADHD. Clinical experience demonstrates that occupational therapists can make distinctive contributions to the processes of evaluation, diagnosis, and different components of multi-faceted intervention. In order to explore the current practice of occupational therapy in the field of ADHD, a national survey has been carried out. This chapter reports the results of the national survey on the level and nature of involvement, and also the learning needs of occupational therapists in the evaluation, diagnosis and management of children with ADHD. Data gathered in this national survey has been used to develop a mode of occupational therapy practice for children with ADHD in the UK.

OCCUPATIONAL THERAPY FOR CHILDREN WITH ADHD IN THE UK

As highlighted in Chapter Two on Literature Review, occupational therapy for children with ADHD is a small field of practice in the UK. There are no papers or reports on the role of occupational therapy for children with ADHD published in peer-reviewed journals. There are also no published clinical guidelines on the processes of occupational therapy evaluation of and intervention for children with ADHD. In the literature review of occupational therapy practice in North America, there was clear evidence that occupational therapists had an important role to play in the evaluation and intervention of children with ADHD (Oetter, 1986a & b; Cermak, 1988a & b; Woodrum, 1992 & 1993; Peterson, 1993; Shaffer, Jacokes, Cassily, Greenspan, Tuchman and Stemmer, 2001).

In order to establish a picture of current practice in the UK, it was essential to conduct a national survey to investigate the level and nature of involvement of occupational therapists in the management of children with ADHD. The following three questions were raised:

1. What is the percentage of practising paediatric occupational therapists having direct involvement in services for children with ADHD, and at what level of involvement?

2. For those who have direct involvement, what is the nature of involvement in the process of assessment and treatment?
3. What are the reasons for non-involvement in the management of children with ADHD?

As training for the management of children with ADHD is usually not on the curriculum of occupational therapy undergraduate education, it would be useful to investigate the mechanisms by which therapists acquired their knowledge, their perceived gaps of knowledge and also their preferred modes of training. The fourth question needed to be answered was:

4. How do paediatric occupational therapists perceive their level of knowledge about ADHD, the means of acquiring knowledge, and gaps in knowledge?

Information gathered in this part of the survey was used to design a 3-day training course for occupational therapists to learn to implement a family-centred occupational therapy care package for children with ADHD.

PURPOSE OF THE STUDY

The main purpose of the national survey was to explore the current practice of occupational therapists for children with ADHD in the UK. In order to answer the four questions raised, the following research objectives were established:-

1. To investigate the level of involvement of paediatric occupational therapists in the management of children with ADHD.
2. To gather information about the nature of involvement in the processes of assessment and treatment of children with ADHD within different service settings.
3. To identify therapists' existing levels of and gaps in knowledge and the preferred modes of post-graduate training.

METHOD

Research Design

The methodology used in this study is a cross-sectional survey research method using a pilot-tested questionnaire. It exposes the sample to a predetermined set of questions, the answers to which can be quantified with descriptive statistics (Payton, 1994; Mathers, Fox and Hunn, 1998).

Survey research is a specialised type of quantitatively based descriptive research. It is directed toward finding out about the characteristics of a well-defined group of people (population) by investigating a sub-group (sample) of that population (Royeen, 1997). Surveys have probably most often been used to study psychological and sociological attitudes, opinions, and behaviours; they can, however, be used to collect almost any kind of factual information as well (Payton, 1994). Surveys can use one or more of a variety of techniques for collecting data from the subjects. Such techniques can be personal interviews, questionnaires sent by mail, fax, or telephone interviews.

The design or plan of survey research is usually based on two main concepts: across time or across subjects (Mann, 1985; Giles, 2002). Surveys that collect data across or over time are called longitudinal surveys. This means that the same questionnaire will be administered to the same subjects over set points in time e.g. Year 1, Year 2, Year 3. They are useful for studying changes that take place over time, when the same participants are administered a variety of measures (or repeated measures) over a specified time period. Surveys that sample subjects at one point in time, but across the variety of subjects within the defined population, are called cross-sectional. That is, the survey is administered across a section of the population of interest.

Although survey research represents one of the most common types of quantitative research methods in health and social care studies, it has different inherent strengths and weaknesses (Rea & Parker, 1992; Fowler, 1993; Alreck & Settle, 1995; Mathers et al, 1998).

The **strengths** of survey research are:

- Surveys are relatively inexpensive (especially self-administered surveys).
- Surveys are useful in describing the characteristics of a large population. No other method of observation can provide this general capability.
- Since most surveys do not expose individuals to possibly invasive techniques or withhold treatment, they may be considered more ethical.
- They can be administered from remote locations using mail, email or telephone by a small team of people.
- Survey can access to otherwise difficult-to-locate, busy populations.
- Consequently, very large samples are feasible, making the results statistically significant even when analysing multiple variables.
- Many questions can be asked about a given topic giving considerable flexibility to the analysis.
- There is flexibility at the creation phase in deciding how the questions will be administered: as face-to-face interviews, by telephone, as a group administered written or oral survey, or by electronic means.
- Standardized questions make measurement more precise by enforcing uniform definitions upon the participants.
- Standardization ensures that similar data can be collected from groups then interpreted comparatively (between-group study).
- Usually, high reliability is easy to obtain by presenting all subjects with a standardized stimulus; observer subjectivity is greatly eliminated.
- Respondents can look up information or consult with others.
- Surveys can easily be combined with other methods to produce richer data e.g. using focus groups or in-depth interviews.

The **weaknesses** of survey research are:

- A methodology relying on standardisation forces the researcher to develop questions general enough to be minimally appropriate for all respondents, possibly missing what is most appropriate to many respondents.
- Surveys are inflexible in that they require the initial study design (the tool and administration of the tool) to remain unchanged throughout the data collection.

- It is difficult to obtain cooperation. The researcher must ensure that a large number of the selected sample will reply.
- It may be hard for participants to recall information or to tell the truth about a controversial question.
- It is a slower data collection method than telephone interview.
- As opposed to direct observation, survey research (excluding some interview approaches) can seldom deal with "context."
- Surveys are not so good at explaining why people think or act as they do.

Furthermore, survey research tends to be weak on validity but strong on reliability (Belson, 1986). The artificiality of the survey format puts a strain on validity. Since people's real feelings are hard to grasp in terms of such dichotomies as "agree/disagree," "support/oppose," "like/dislike," etc., these are only approximate indicators of what we have in mind when we create the questions. Reliability, on the other hand, is a clearer matter. Survey research presents all subjects with a standardized stimulus, and so goes a long way toward eliminating unreliability in the researcher's observations. Careful wording, format, content, etc. can reduce significantly the subject's own unreliability.

Warwick and Lininger (1975) argued that sample survey is an appropriate and useful means of gathering information under three conditions: when the goals of the research call for quantitative data, when the information sought is reasonably specific and familiar to the respondents, and when the researcher has considerable prior knowledge of particular problems and the range of responses likely to emerge. The researcher considered that the above three conditions had been fulfilled in selecting cross-sectional survey method for this study.

Participants

In this national survey, the sample of participants was therapists who are members of the National Association of Paediatric Occupational Therapists (NAPOT), which is a specialist section of the College of Occupational Therapists in the UK.

Data Collection Instrument

The questionnaire used in this survey was pilot-tested with 24 paediatric occupational therapists working in different service settings in different parts of the country. They were therapists selected from a pool of therapists who had attended a 3-day Clinical Workshop on “Occupational Therapy for Children with ADHD and Related Disorders” presented by the author in different parts of the country. They were carefully selected in order to ensure representation for therapists working at different grades, service settings and geographical areas. They were contacted by telephone and invited to provide comments on the questionnaire.

The questions were selected by the author in order to gather quantitative data to explore the areas being investigated. The questionnaire was based on the three research objectives of this survey research. The final version of the survey question is enclosed in **Appendix B**. Based on the feedback received, some questions were:-

- elaborated e.g. years of experience in all Occupational Therapy clinical areas and in paediatric occupational therapy ONLY in Question 3,
- added with more choices e.g. current area of work in Question 5, and nature of input in Question 10,
- specified e.g. the adding of caseload percentage equals to 100% in Question 7 as the figures provided by some therapists either more or less than 100%,
- changed e.g. a Likert Scale of 5 was used in Question 12 instead of choice of 4,
- deleted e.g. a specific question on the approximate percentage of children who have ADHD, as most therapists found it difficult to answer this question,
- re-styled e.g. some questions were styled by using boxes of choices, and more spacing between questions.

Data Collection Procedures

The questionnaire was sent with a covering letter stating the aims of the survey through the NAPOT Journal circulation. It also highlighted that participation in the survey was completely voluntary, information received would be kept strictly

confidential and the therapist's name would not be identified. Therapists were requested to return the completed questionnaires to the author within two months by using the self-addressed envelope.

Data Analysis

Data collected were analysed by using the Statistical Package for Social Sciences (SPSS) – Version 10 (Norussis, 2000). Descriptive statistical techniques were used in order to quantify the responses e.g. measures of central tendency, measures of dispersion, and frequency distribution. These descriptive statistical techniques are useful to analyse and describe the data. Data analysed were organised into different tables reported in the next section.

RESULTS

Response Rate

In total, 941 questionnaires were sent out through the NAPOT Journal circulation. 291 questionnaires were returned. Nine returned questionnaires were not completed as they were addressed to retired members, student members, organisational members or members who were not currently working or working with adults. 282 completed questionnaires were used in the data analysis of this survey, i.e. a 30% response rate which was considered to be acceptable for a survey research project (Bailey, 1991).

Characteristics of Participants

Table 4.1 outlines the demographic data of therapists who participated in the survey. 98.6% of the therapists were female. Most of them had completed a full-time diploma course through an occupational therapy school in the UK. 62.1% of the therapists were at Senior I grade which is perceived to be the main clinical grade in the field of paediatric occupational therapy. The main management grade for paediatric occupational therapists was Head III with 30 responders (10.6%). 9.2% of therapists selected "Others" for their grades and positions. "Others" includes therapists who worked in social services, therapists who were at senior management grade, occupational therapy lecturers and also therapists in private practice.

Table 4.1: Demographic Data of Therapists Participating in the Survey

Areas	Frequency	Percentage
<u>Gender</u>		
• Female	278	98.6
• Male	4	1.4
	N = 282	100.0
<u>Occupational Therapy Training</u>		
• Full-Time Training	277	98.2
• Part-Time Training	5	1.8
	N = 282	100.0
• Diploma Course	172	61.0
• 3-Year Degree Course	68	24.1
• 4-Year Degree Course	34	12.1
• 2-Year Degree Course	7	2.5
• Missing Data	1	0.3
	N = 282	100.0
• UK Occupational Therapy Schools	254	90.1
• Overseas Occupational Therapy Schools	28	9.9
	N = 282	100.0
<u>Current Grade / Position</u>		
• Basic Grade	4	1.4
• Senior II	31	11.0
• Senior I	175	62.1
• Head IV	6	2.1
• Head III	30	10.6
• Clinical Specialist	9	3.2
• Head II	1	0.4
• Head I	0	0.0
• Others	26	9.2
	N = 282	100.0
<u>Areas / Settings of Work</u>		
• Community Child Health Services	153	54.3
• Child and Adolescent Mental Health Services	19	6.7
• Acute Hospital & Community Health Services	28	9.9
• Acute Hospital, primarily inpatient services	7	2.5
• Social Services	24	8.5
• Specific Services e.g. Learning Disabilities	7	2.5
• Others	43	15.2
• Missing data	1	0.4
	N = 282	100.0
<u>Number of Full-Time and Part-Time Therapists</u>		
• Full-Time	150	53.2
• Part-Time	131	46.5
• Missing	1	0.3
	N = 282	100.0

N = Number of Subjects

54.3% of the respondents worked in a community child health service. There were only 6.7% therapists who worked in a child and adolescent mental health service (CAMHS) which is usually the main service provider for children with ADHD. There were 15.2% of therapists who selected "Others" for their areas/settings of work. These included therapists who work privately, in voluntary agencies, in independent special schools, in occupational therapy schools and also in a research capacity. There were nearly equal percentages of therapists working in a full-time or part-time capacity (i.e. 53.2% versus 46.5%).

Participants' Clinical Experience and Current Caseload

Table 4.2 indicates participants' clinical experience and the nature of their current clinical work. The average number of years of experience in all occupational therapy clinical areas was 13.1 years, and in paediatric occupational therapy was 8.4 years. With standard deviations of 8.0 and 6.4 respectively, this indicates that the respondents to the survey were a very mixed group i.e. some with years of experience as high as 40, while some were just newly qualified.

Table 4.2: Description of Clinical Experience and Current Caseload

Areas	Min	Max	Me	SD
<u>Years of Clinical Experience (N = 282)</u>				
• In all Occupational Therapy Clinical Areas	0.5	40.0	13.1	8.0
• In Paediatric Occupational Therapy only	0.0	36.0	8.4	6.4
<u>Current Caseload</u>				
(percentage of conditions on caseload, N = 277)*				
• Specific Developmental Disorders e.g. DCD.	0.0	100.0	27.7	26.8
• Physical Disabilities e.g. cerebral palsy.	0.0	100.0	25.5	24.1
• Learning Disabilities - mild, moderate, severe.	0.0	100.0	14.3	21.3
• General Developmental Delay.	0.0	80.0	8.0	11.6
• Childhood Mental Health Problems e.g. ADHD.	0.0	100.0	7.7	21.4
• Autistic Spectrum Disorder / Asperger's Syndrome.	0.0	60.0	6.9	8.6
• Acquired Neurological Conditions e.g. head injury.	0.0	100.0	4.2	10.1
• Orthopaedic Conditions.	0.0	45.0	1.7	5.3
• Neonatalogical Problems e.g. pre-term babies.	0.0	80.0	1.3	6.3
• Others.	0.0	100.0	2.5	12.3
Key: N = Number of Subjects Min = Minimum Max = Maximum Me = Mean SD = Standard Deviation DCD = Developmental Coordination Disorder * Not all 282 respondents answered all questions. Hence the lower value of N.				

The most common caseloads were children with specific developmental disorders (27.7%), physical disabilities (25.5%), learning disabilities (14.3%) and general developmental delay (8%). Only a small number of therapists indicated that they had caseloads of children with childhood mental health problems (7.7%). This small percentage is most likely related to the small number of therapists who work in the CAMHS settings.

Level and Nature of Involvement in the Assessment and Treatment of ADHD

There were only 24 therapists (8.5%) who indicated that they were working in a multidisciplinary team/service designated for children with ADHD (see **Table 4.3**). Most of the respondents (63.8%) were not involved in a designated service but did see children with ADHD as part of their overall caseload. 27% of therapists indicated that they did not see children with ADHD because of various reasons, e.g. not within scope and referral criteria of the services, lack of knowledge and skills.

Of the 24 therapists who were working in a designated service, 13 (54.2%) were involved in initial screening, 22 (91.7%) were involved in the process of diagnosis, 14 (58.3%) were involved in aspects of the multi-faceted intervention, and 4 (16.7%) were involved in education and training. Only one respondent (4.2%) indicated that he/she was involved in research in ADHD. **Table 4.4** outlines the background of these 24 therapists in term of years of experience, current grade/position, areas/settings of work, and also therapists' ratings for their level of knowledge and skills.

For the reasons of non-involvement, 69.1% of the respondents said that they saw children with ADHD as part of their overall caseload. The children were being seen because they presented different sensory, perceptual, motor and functional difficulties and not because of their features of ADHD. Other reasons were related to the scope of the service (31.3%), criteria of referral (17.0%), resource of the service (28.5%), and lack of knowledge and skills (20.7%). Only 4.3% of respondents indicated that children with ADHD were not referred to their services because occupational therapists were not perceived to have a recognised role for children with ADHD.

Table 4.3: Level and Nature of Involvement in the Assessment and Treatment of Children with ADHD

Areas	Frequency	Percentage
<u>Level of Involvement</u>	(N = 282)	
<ul style="list-style-type: none"> • Involved in a multidisciplinary team/service designated for children with ADHD. • Not involved in a designated service. Children with ADHD are being seen as part of overall caseload. • Not involved in service for children with ADHD. • Missing data. 	24 180 76 2	8.5 63.8 27.0 0.7
	282	100.0
<u>Nature of Involvement in Different Areas</u>	(N = 24)	
<p>Of the 24 therapists who were involved in a designated team or service, the number of therapists involved in:-</p> <ul style="list-style-type: none"> • Initial Screening • Process of Diagnosis • Multi-faceted Intervention • Education and Training • Research 	13 22 14 4 1	54.2 91.7 58.3 16.7 4.2
<u>Reasons for Non-Involvement</u>	(N = 256)	
<ul style="list-style-type: none"> • Children with ADHD are not within the scope of the service. • Children with ADHD do not fulfil the criteria of referral of the service. • Resource of the service is mainly for children with other conditions e.g. physical disability. Unable to extend the service to children with ADHD. • Therapists do not have the necessary knowledge and skills in the field of ADHD. • Occupational Therapists do not have a recognised role for children with ADHD. • Children with features of ADHD are generally referred as part of overall caseload because they present different sensory, perceptual, motor and functional difficulties. 	80 46 73 53 11 177	31.3 17.0 28.5 20.7 4.3 69.1

Table 4.4: Background of the 24 Therapists involved in a Designated Team/Service for Children with ADHD

(N = 24)	Min	Max	Mean	SD
Years of Experience in Paediatric Occupational Therapy	1.00	28.00	10.52	7.09

Key: N = Number of Subjects Min = Minimum Max = Maximum SD = Standard Deviation

Areas	Frequency	Percentage
<u>Current Grade/Position</u>		
• Basic Grade	0	0.0
• Senior II	1	4.2
• Senior I	18	75.0
• Head IV	0	0.0
• Head III	1	4.2
• Clinical Specialist	3	12.5
• Head II	1	4.2
• Head I	0	0.0
• Others	0	0.0
	24	100.0
<u>Areas / Settings of Work</u>		
• Child and Adolescent Mental Health Services	11	45.8
• Community Child Health Services	7	29.2
• Acute Hospital & Community Health Services	3	12.5
• Acute Hospital, primarily inpatient services	1	4.2
• Social Services	0	0.0
• Specific Services e.g. Learning Disabilities	0	0.0
• Others	2	8.3
• Missing data	0	0.0
	24	100.0
<u>Therapists' Ratings on Their Level of Knowledge & Skills</u>		
• High Level	2	8.3
• Good Level	8	33.3
• Average Level	12	50.0
• Basic Level	1	4.2
• Poor Level	0	0.0
• Missing Data	1	4.2
	24	100.0

Therapists' Knowledge in the Assessment and Treatment of ADHD

As illustrated in **Table 4.5**, a majority of therapists rated their level of knowledge and skills in ADHD to be either at a poor level (10.3%), basic level (36.5%) or an average level (35.5%). Only 14.5% and 2.5% of therapists rated themselves to have a good level or a high level of knowledge and skills. There are many different learning methods for the therapists to acquire their existing knowledge. The most common methods were self-study (80.8%), from occupational therapy colleagues (59.8%), through study days (45.2%) and from other colleagues in the multidisciplinary team (43.8%). Most therapists did not think that either occupational therapy undergraduate or postgraduate education had provided them with an adequate knowledge base in ADHD.

For the perceived gaps of knowledge and skills in ADHD, more than 50% of the participants selected nearly all the areas except in the “clinical features and diagnostic criteria of ADHD” (32.0%). The highest rated gaps were on information of evidence-based practice and clinical guidelines (81.3%) and goal setting and documentation pertaining to the specific needs of children with ADHD (77.6%).

Preferred Modes of Training or Acquiring Information

Therapists were asked to rate five modes of training from the first (most preferred) to the fifth (least preferred) choice. 60.1% of therapists rated specific occupational therapy clinical workshops to be the first choice, 33.5% rated multidisciplinary seminars / study days to be the second choice, and 37.4% chose study through journal articles, books and other publications to be the third choice (see **Table 4.6**). For the fourth and fifth choices, there is confusion in the figures as some therapists have used the same rating more than once e.g. some therapists use two rating of 4 or two ratings of 5 for the last two choices of mode of training on the list in the questionnaire (i.e. 1, 2, 3, 4, 4, or 1, 2, 3, 5, 5) rather than the suggested rating of 1 to 5.

Table 4.5: Therapists' Knowledge in the Assessment and Treatment of ADHD

Areas	Frequency	Percentage
<u>Therapists' Ratings on Their Level of Knowledge & Skills</u>		
	(N = 282)	
• High Level	7	2.5
• Good Level	41	14.5
• Average Level	100	35.5
• Basic Level	103	36.5
• Poor Level	29	10.3
• Missing Data	2	0.7
	2832	100.0
<u>Factors that Contribute to Their Existing Knowledge</u>		
	(N = 281) 1 Missing Data	
Knowledge acquired from:-		
• Self-Study	227	80.8
• Occupational Therapy Colleagues	168	59.8
• Study Day	127	45.2
• Other Colleagues in the Multidisciplinary Team	123	43.8
• Conference	68	24.2
• Occupational Therapy Workshop on ADHD	51	18.1
• Other Contributions e.g. direct clinical experience, TV etc.	35	12.5
• Occupational Therapy Undergraduate Education	28	10.0
• Other Postgraduate Education	12	4.3
• Occupational Therapy Postgraduate Education	11	3.9
<u>Gaps in Their Knowledge and Skills</u>		
	(N = 272) 10 Missing Data	
• Clinical features and diagnostic criteria of ADHD.	87	32.0
• Evaluation of ADHD through a team approach.	137	50.4
• Specific Occupational Therapy assessment procedures	178	65.4
• Knowledge of the multi-faceted intervention method.	180	66.2
• Specific Occupational Therapy treatment strategies.	159	58.5
• Information of evidence-based practice & clinical guideline.	221	81.3
• Goal setting and documentation pertaining to the specific needs of children with ADHD.	211	77.6

Table 4.6: Preferred Modes of Training or Acquiring Information

Preferred Modes	First Choice		Second Choice		Third Choice		Fourth Choice		Fifth Choice		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	T No.*	T %
Specific Occupational Therapy Clinical Workshop	155	60.1	60	23.3	20	7.8	15	5.8	8	3.1	258	100.0
Multidisciplinary Seminar / Study Day	39	15.2	86	33.5	74	28.8	43	16.7	15	5.8	257	100.0
Through journal articles, books and other publications on ADHD, especially those written by Occupational Therapists	21	8.2	43	16.7	96	37.4	65	25.3	32	12.5	257	100.0
Structured Mentoring Programme through clinical placement in a specific service setting	42	16.4	44	17.2	44	17.2	56	21.9	70	27.3	256	100.0
Attend National / International Conference on ADHD	7	2.7	24	9.4	26	10.2	73	28.5	126	49.2	256	100.0

* T No. – indicates the total number of therapists who have completed these questions. It is less than 282, as some therapists did not respond to these questions. Also, a small number of therapists used the ratings of choices more than once, especially related to the last two options of preferred modes (see text for details).

Bold printed figures indicate highest frequency of responses for a particular mode of training in relationship to the order of choices.

DISCUSSION

Response Rate

The response rate of 30% is considered to be reasonable and acceptable for a survey research (Bailey, 1991). The “not very high” response rate could be related to the fact that not many therapists actually work with children with ADHD. As a result, they may not see the significance of completing and returning the questionnaires. Other factors could be related to their busy workload or because a stamp had not been provided on the self-addressed envelope for financial reasons. Timing of the survey may also have contributed to the low return as it was just after Christmas and New Year Holidays.

Sampling of Participants

6.7% of therapists who responded to the survey worked in a CAMHS setting. This low figure could be related to the situation that not all occupational therapists working in CAMHS are members of NAPOT. As a result, data collected in this survey may not fully represent therapists who work in CAMHS settings.

Level and Nature of Involvement in the Assessment and Treatment of ADHD

The results of this national survey indicated that only 24 (i.e. 8.5%) therapists had involvement in a designated service for children with ADHD. They were mainly involved in initial screening, processes of diagnosis and aspects of the multi-faceted intervention for children with ADHD (see Table 4.3). In comparing data in Table 4.1 and 4.4, the mean year of experience in paediatric occupational therapy among these 24 therapists is higher than the mean for the whole sample i.e. 10.52 years versus 8.4 years. Similar to the figure of the whole sample, most therapists are at Senior I grade. There are a higher percentage of clinical specialists in this group of therapists than the whole sample i.e. 12.5% versus 3.2%. This could be related to the nature of specialisation in this field. For the areas/settings of work, there were 11 out of the 24 therapists who had involvement in a designated service for children with ADHD were working in a CAMHS i.e. 45.8%. This was much higher than the figure (6.7%) for the whole sample. They also rated themselves higher in terms of level of knowledge and skills in ADHD (compared Table 4.4

and 4.5). Given all these factors, it seemed that the most contributing factor for their involvement in a designated service for children with ADHD was related to the fact that 45.8% were working in a CAMHS which is usually the primary service setting for children with ADHD in the UK.

The majority of the respondents did not have involvement in a designated service though 63.8% of them did see children with ADHD as part of their caseload. Children who presented with features of ADHD are mostly seen by occupational therapists in community settings as children with a specific developmental disorder i.e. have deficits in different sensory, perceptual, motor and functional performance areas. Consequently, they are often not referred because of their ADHD features. This is most likely related to the high incidence of comorbidity of ADHD with other conditions described in the literature review. As identified in the literature review, children with the combination of ADHD and DCD appear to carry a particularly gloomy prognosis (Rasmussen and Gillberg, 2000). In considering this research evidence, it is important for occupational therapists who work with children with DCD to have good level of knowledge of ADHD.

Regarding other reasons of non-involvement in a designated service for children with ADHD, about 17% to 31% of therapists (see Table 4.3) stated that this was related to the criteria of referral, resource and scope of the service. This was also reflected in their percentages of caseloads that were predominately children with specific developmental disorders, physical and learning disabilities in the community. These data indicated that the commissioning of paediatric occupational therapy services within the health services did have an effect on the provision of service to children with different conditions. In this instance, most paediatric occupational therapy services in the UK are commissioned to provide services to children with different recognisable conditions rather behavioural disorders like ADHD. These services are not able to extend their scope to children with ADHD, as they need to fulfill the contract for the existing caseload.

Therapists' Knowledge in the Assessment and Treatment of ADHD

20.7% of the total sample indicated that lack of knowledge and skill could also contribute to non-involvement in a designated service for children with ADHD. There were a total of 46.8% (36.5% plus 10.3%, see Table 4.5) who stated that their levels of knowledge and skills were at a basic or poor level. Over half the total sample highlighted gaps in their knowledge in the areas of evaluation, specific assessment and treatment procedures, evidence-base practice, goal setting and documentation. Without adequate working knowledge, it will be impossible for therapists to be involved in the assessment and treatment of children with ADHD. The question arises: "should knowledge of the management of children with ADHD be covered in the occupational therapy training?". If it is not covered in undergraduate education, should it be covered in a form of postgraduate training?

Preferred Modes of Training or Acquiring Information

The above discussion highlighted the need for occupational therapists to acquire knowledge through different modes. 60.1% chose specific occupational therapy clinical workshops as the first preferred mode of training. When developing specific clinical workshop, it is important to draw experience from therapists who work in child health and CAMHS settings. Funding and study leave for attending such workshops should formulate part of the Personal Development Plan. It should also be an essential component of the Continuous Professional Development of paediatric occupational therapists. Some therapists commented that the structured mentoring programme is a very good choice but there are always problems in funding and also staff time. In terms of self-study, therapists may need to be aware of the variety of clinical guidelines outlined in the literature review as 81.3% of therapists indicated gaps in this aspect of knowledge.

Limitations of the Study

Due to the low, though acceptable, response rate, caution should be exercised in generalising the results to the whole profession. The sampling of subjects through NAPOT membership may have missed out many therapists who are not members, especially therapists who work within a CAMHS setting which is usually the primary service provider for children with ADHD. It is also important to

acknowledge the fact that different ways in constructing questionnaire will have effects on the data collected. For example, the author chose three statements in defining the level of involvement. The clinical work of some therapists may not fall neatly into these three levels e.g. those therapists who work in multiple settings. As the questions were designed to gather information in a quantitative manner, it may not have been possible to capture therapists' ideas and opinions not covered by the questions. The use of semi-structure interviews should be considered in future study.

Overall, the results generated through this national survey provided useful information about the current practice of occupational therapy for children with ADHD. These results highlighted the need to develop a model of practice for occupational therapists who work with or intend to work with children with ADHD. It will help to unify practice and also develop recognition of the unique contributions that could be made by occupational therapists.

CONCLUSIONS

There has been a substantial increase in clinical activity related to the identification and treatment of children with Attention Deficit Hyperactivity Disorder (ADHD) in the United Kingdom (Bramble, 1997). Accurate diagnosis and successful management of children with ADHD require a multi-faceted evaluation and treatment package provided by a team of medical, psychological, educational and therapy professionals. Occupational therapists can make distinctive contributions to the processes of evaluation, diagnosis, and multi-faceted intervention.

A national survey was carried out to investigate the current practice of occupational therapists for children with ADHD in the UK. A pilot-tested questionnaire was sent to all 941 members of the National Association of Paediatric Occupational Therapists (NAPOT). The response rate of this survey was 30%, i.e. 282 completed questionnaires returned. Results indicated that only 8.5% of therapists who responded to the survey had involvement in a designated service for children with ADHD. 27% indicated that they did not see children with ADHD. 63.8% of therapists did see children with ADHD as part of their overall

caseload in a community service mainly because of children's associated problems in different sensory, perceptual, motor and functional performance. 20.7% indicated that lack of knowledge and skill could contribute to non-involvement in the assessment and treatment of children with ADHD. Other reasons for non-involvement in a designated service ranged from limitations in the criteria of referral, resources and scope of the services.

There were a total of 46.8% who stated that their levels of knowledge and skills were basic or poor. Over half the total sample highlighted gaps in their knowledge in the areas of evaluation, specific assessment and treatment procedures, evidence-based practice, goal setting and documentation. The survey highlighted the learning needs of occupational therapists working with children with ADHD. Without adequate working knowledge, it will be impossible for therapists to be involved in the assessment and treatment of children with ADHD. Therapists need to acquire up-to-date knowledge on the clinical features, diagnostic criteria, etiology and contemporary theories of ADHD in order to make significant contributions in the processes of evaluation and intervention. The top two preferred modes of training were specific occupational therapy clinical workshops and multidisciplinary seminars / study days.

Limitations in this study have been discussed. Results generated through this national survey provided useful information about the current practice of occupational therapy for children with ADHD. They indicated that occupational therapy for children with ADHD is a small field of practice in the UK. The lack of published literature in the UK also reflected the findings as not many therapists have the skills and knowledge to contribute journal articles, clinical case studies and discussion papers in different professional publications. These findings highlighted the need to develop a model of practice for occupational therapists who work with or intend to work with children with ADHD. Such a model will help to unify practice and also develop recognition of the unique contributions that could be made by occupational therapists.

The next steps should be developing general consensus on the role of occupational therapy for children with ADHD by using a structured consensus development method, and then validating the role by carrying out research study on the efficacy of occupational therapy inputs. Information generated from the consensus development will be used to develop the model of practice and also a training course to equip occupational therapists the necessary technical knowledge in the assessment and treatment of children with ADHD. Occupational therapists who work with children and adolescents either in the fields of child health or child psychiatry should work together to carry out research in order to develop and validate the specific role of occupational therapy for children with ADHD.

Chapter Five

Consensus Development on the Role of Occupational Therapy for Children with ADHD

“Where unanimity of opinion does not exist due to a lack of scientific evidence, as well as where there is contradictory evidence on an issue, consensus methods can be used. They attempt both to assess the extent of agreement (consensus measurement) as well as resolve disagreement (consensus development), and generally consider evidence from a wider range of study types than is the case in statistical reviews.”

(Jones & Hunter, 2000, p.40)

INTRODUCTION

In the United Kingdom (UK), occupational therapy for children with ADHD is a small field of practice (Chu, 2003a). The role of occupational therapy in facilitating engagement in meaningful tasks and successful participation in different occupations can be broadened to this new area of practice. This timely and important change makes it necessary to establish the specific role of occupational therapy in order to unify practice and also to ensure a holistic approach to the evaluation of and intervention for this specific developmental disorder.

A consensus development research method, based on the conceptual model developed by Murphy et al (1998), was used to develop a general consensus on the role of occupational therapy for children with ADHD. This chapter reports the results of the consensus development on the role of occupational therapy in the areas of team approach, evaluation and diagnosis, assessment procedures, multi-faceted intervention, education and training, and research. It provides essential information to be used as the basis for the development of the model of practice.

BACKGROUND INFORMATION

It was highlighted in the extensive literature review outlined in Chapter Two that there were very few published studies describing the role of occupational therapy for children with ADHD. Although there are a few published papers describing occupational therapy practice in using sensory integrative approach and other treatment frameworks in North America, the specific role of occupational therapy for children with ADHD is not articulated clearly in these papers.

That occupational therapy for children with ADHD is a small field of practice was reflected in the results of the national survey described in Chapter Four. In summary, only 8.5% of paediatric occupational therapists involved in the survey had involvement in a designated service for children with ADHD in the UK. 27% indicated that they do not see children with ADHD. 63.8% of therapists see children with ADHD as part of their overall caseload in a community service mainly because of children's associated problems in different sensory, perceptual,

motor and functional performance, not because of their diagnoses of ADHD. 20.7% indicated that lack of knowledge and skill could contribute to their non-involvement in this field.

Nearly half of the therapists stated that their levels of knowledge and skills were basic or poor. Over half the total sample highlighted gaps in their knowledge in the areas of evaluation, specific assessment and treatment procedures, evidence-based practice, goal setting and documentation. Without adequate working knowledge, it will be impossible for therapists to be involved in the assessment and effective treatment of children with ADHD.

These results highlighted the need to develop an occupational therapy model of practice for children with ADHD and, as indicated, will help to unify practice and also develop recognition of the unique contributions that could be made by occupational therapists. As there are no papers and occupational therapy clinical guidelines published in peer-reviewed journals in the UK, the use of a consensus research method will serve as a starting point to define the role of occupational therapy for children with ADHD. The defined role will be used to contribute to the formulation of the model of practice.

CONSENSUS DEVELOPMENT METHODS

Murphy et al (1998) defined consensus development as a process of making policy decisions by using available scientific data or collective experience of the participants optimally. They stressed that consensus development is not a scientific method for creating new knowledge but a method of capturing collective knowledge or opinions in a particular field. Also, that consensus development method is a complex process that involves decision-makings at both the individual and group level. Fletcher (1997) highlighted the limited role of such methods as they rarely resolve disputes where strong disagreement exists among participants.

As described by various authors (Murphy et al, 1998; Jones & Hunter, 2000; Kitzinger, 2000; and Hollis, Openshaw and Goble, 2002), there are generally four main methods of consensus development used in the healthcare field: 1) the Focus Group Method, 2) the Delphi Method, 3) the Nominal Group Technique, and 4) the

Consensus Development Conference Method. All these methods involve the participation of a group of individuals, who are either expert in a particular field, professionals working in that field, or users of a service within that field. Different methods use different procedures to gather opinions and experiences from the participants. The advantage of a group decision over a single expert opinion is that a wide range of opinions, knowledge and experience is collected. And also, the group as a whole may carry more weight than any one individual. However, Murphy et al (1998) highlighted that the tendency to treat group decisions as unanimous could be a problem when the degree of dissent within the group is an important piece of information.

It should be noted that there are issues related to the selection, availability and interaction of a group of individuals participating in all the methods. In the selection of participants, it is essential to avoid one or more individuals dominating the discussion. In certain fields of practice, there may not be a group of experts available to participate in the work. There are also issues related to the costing when bringing people together and also the length of time needed to generate the data. However, despite many unresolved methodological questions, consensus methods are increasingly being used to determine consensus in practice and clinical guidelines (Murphy et al, 1998). The following sections provide a brief review of the four consensus development methods.

The Focus Group Method

The Focus Group Method (FGM) was introduced in 1950s (Merton, Fiske and Kendall, 1956; cited in Hollis et al, 2002). FGM is an in-depth qualitative interview with a small number of participants who are chosen for their knowledge and experience of the topics being explored (American Statistical Association, 1997). The researcher will prepare questions in advance to facilitate discussion among the participants, which could last about 2 hours. According to Kitzinger (2000), FGM emphasises the communication between participants in order to generate data. Instead of the researcher asking opinions from each participant, they are encouraged to exchange ideas with each other. This helps participants to explore and clarify their views. An individual interview situation would be less effective for this purpose. The group discussion used in the FGM is particularly

useful when the researcher has a series of open-ended questions. At the end of the FGM, the researcher will analyse all the data generated and draw themes arising from the group responses. Although FGM has been used to achieve consensus, Hollis et al (2002) comment that there are other more reliable methods.

The Delphi Method

The Delphi Method (DM) was introduced in 1950s (Pill, 1971; cited in Murphy et al, 1998). In the DM, a panel of experts is invited to contribute their opinions through several rounds of postal questionnaires (Hollis et al, 2002). According to Murphy et al (1998), the panel of experts never meets or interacts directly throughout the process. They are asked to record their views in the questionnaires sent to them or through e-mails. The researcher then collates the responses and replies back to participants in summary form indicating the group judgement and the individual's initial judgement. Sometimes the participants are given the opportunity to revise their judgement in the light of the group feedback. The process may be repeated a number of times. At the end of the process, the researcher will statistically analyse the judgements of all participants and produce a general consensus on the topic discussed. In practice, DM is a lengthy process. It lacks the opportunity afforded by the FGM for discussion, exchanges and debate of ideas (Hollis et al, 2002). Jones & Hunter (2000) suggest that the DM may be most appropriately used where opinions are being sought when there is little or no role for evidence.

The Nominal Group Technique

The Nominal Group Technique (NGT) was developed in the 1960s in the context of committee decision-making (Delbecq & Van de Ven, 1971; cited in Murphy et al, 1998). The NGT is also known as the 'expert panel' (Hollis et al, 2002). According to Murphy et al (1998), the NGT uses a highly structured meeting to gather information from relevant practitioners about a given issue. The technique consists of two rounds in which participants rate, discuss and then re-rate a series of items or questions. The rankings or scorings are actually provided on an individual basis. The NGT uses the available evidence but also allows for insight to be derived from the experience of relevant clinicians. Although the responses are individually scored, there is an opportunity for group interaction and sharing of

information and opinions. The responses are then analysed statistically to derive the general consensus. The NGT enables the collection of ideas from people with quite diverse expertise on a topic. It is also relatively easy to organise and could generate consensus within a shorter time scale. The NGT might also be preferable when opinions are shared but nuances are required to be teased out on an individual basis (Jones & Hunter, 2000).

In the context of health care, the NGT has been used to examine the appropriateness of clinical interventions for diabetic patients (Hares, Spencer, Gallagher, Bradshaw and Webb, 1992), to develop consensus on nursing education (Pendleton & Myles, 1991), to evaluate the clinical practice of an assertive community treatment group (Prince, Demidenko and Gerber, 2000), to identify priorities of clinical duties in nursing (Carney, McIntosh, and Worth, 1996), to identify the importance of consumer participation in planning health promotion programmes (Twible, 1992), and to explore occupational therapy and physiotherapy supervisors' opinions of student competence in their first fieldwork placement (Steward, 2001). Overall, these examples establish the appropriateness of using the NGT in health related research.

The Consensus Development Conference Method

The Consensus Development Conference Method (CDCM) was introduced in 1977 by the National Institute of Health in the USA (Fink, Kosecoff, Chassin and Brook, 1984; cited in Murphy et al, 1998). According to Murphy et al (1998) in the CDCM, a selected group of experts is brought together in an open meeting to reach consensus about an issue. Various experts present evidence at the conference, possibly over the course of a few days. Group members are allowed to ask questions and raise issues pertaining to the topic discussed. At the end of the presentation, members of the decision-making group then retire to consider the questions in the light of the evidence presented and attempt to reach consensus. In the CDCM, a chairperson facilitates both the open parts of the conference and the private group discussion on decision-making. So far, the CDCM is more used as a public forum rather than decision-making issues related to healthcare practice.

THE STRUCTURE AND PROCEDURES OF THE CONSENSUS DEVELOPMENT METHOD USED IN THIS RESEARCH STUDY

In practice, there are always situations in which researchers cannot use the above methods in their standard or pure form. Very often researchers need to modify the procedures of a method or integrate components from different methods in order to create a structure of interaction which can serve the purpose of achieving consensus agreement (Murphy et al, 1998).

Factors to be Considered in Selecting Consensus Development Method in this Research Study

In selecting a consensus development method, it is important to consider the specificity of that method in relationship to the topic being discussed, e.g. the number and background of participants, the existence of evidence, the level of knowledge of the participants, the strengths and limitations in the structure of interaction, the time and costing involved. For example, the Delphi Method is used when only opinions are being sought, whereas NGT is used when evidence is assessed as well as expert opinion (Jones & Hunter, 2000). In the field of occupational therapy for children with ADHD, there is not an identifiable group of expert therapists who could contribute to the consensus development. Strictly speaking, the Delphi Method, the NGT and the CDCM could not be used in their pure forms for this study. Therefore, some degree of modification and adaptation of these methods is required to create a structure of consensus development method used in this study.

In terms of available evidence, there is a small amount of research evidence to support the role of occupational therapy for children with ADHD. Most available research evidence on the management of children with ADHD is from medical, psychological and educational fields. And also, the level of knowledge and clinical experience among paediatric occupational therapists on the current research and management of children ADHD is variable (Chu, 2003a). Therefore, it will be difficult for them to participate in the consensus development without updated knowledge about the aetiology, evaluation, diagnosis and intervention in

respect of children with ADHD. As a result, it may be more appropriate to develop consensus agreement on role statements related to occupational therapy practice by using existing evidence from the other fields and clinical experience.

Therapists participating in the study will need to have updated information on ADHD and the proposed role statements prior to the group interaction. The Delphi Method is not appropriate for this study as opinions are being sought when there is little or no role for evidence, while the two rounds of ranking used in the NGT would be more appropriate when there is a body of relevant evidence that participants could integrate into their decision-making processes (Jones & Hunter, 2000).

Furthermore, it is difficult for therapists to participate in research study because of their heavy workload and the costing involved in attending the event. It will be easier for therapists to participate in the study if it is part of their continuing professional development and they can get time-off and funding from work to attend a study day on ADHD. Other factors for the research include the costing for organising the events and the time it takes to gather appropriate data within the resource and time scale of a PhD study. The procedure used in the Delphi Method is lengthy, while the group interaction structure used in NGT can create collective responses within a short time.

Another significant factor is related to the structure of the interaction required to achieve consensus development. Obviously, group decisions carry more weight than the opinion of a single expert. The procedures used in the Delphi Method do not allow group discussion and interaction. The Delphi Method has been described as the method of 'last resort' (Jones & Hunter, 2000). The open-ended style of questions and discussion used in the Focus Group Method may not be effective to achieve collective responses on each role statement proposed. In the NGT, all ideas/items will be discussed. The NGT avoids focusing too much on one particular idea. It also avoids judgement of the individual's ideas and allows more ideas to be expressed and elaborated. The interaction structure used in the NGT encourages individual creativity and participation in group decisions as the interaction is structured by means of a facilitator (Murphy et al, 1998).

A Conceptual Model of the Consensus Development Method Used in this Research Study

Murphy et al (1998) develop a conceptual model which provides a structure of applying a particular consensus development method or integrating components from different methods. The model (see **Figure 5.1**) consists of 3 stages (i.e. inputs, process and outputs) and 5 components (i.e. questions, participants, information, method of structuring interaction and method of analysing data).

Inputs Stage

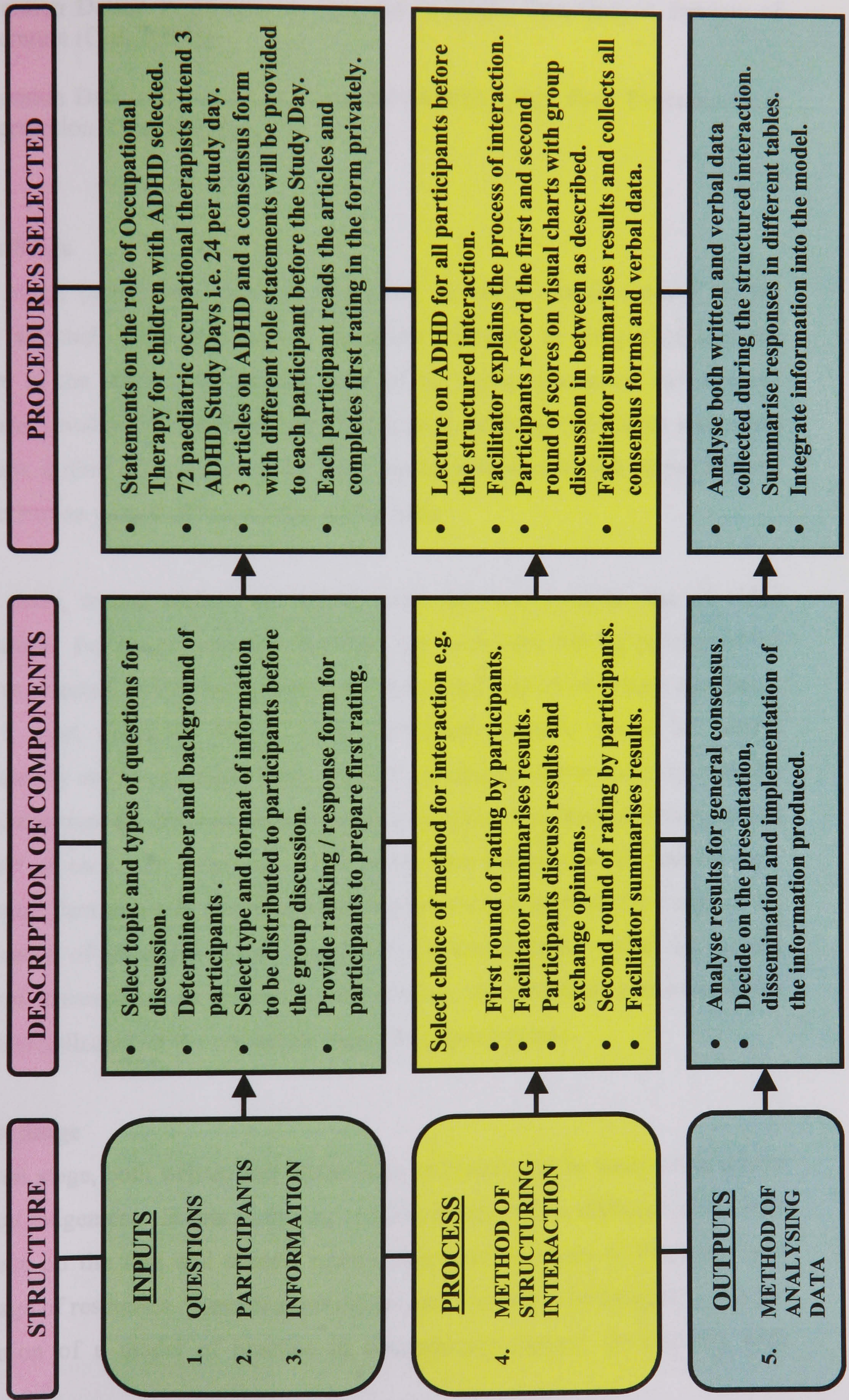
The planning stage includes the selection of an appropriate consensus development method, integration of components from different methods, or modification to a standard method. The '**Questions**' of the study will be decided by selecting the topic and types of questions for discussion. The number and background of '**Participants**' will be determined in relationship to the topic and method selected. The researcher also needs to decide whether or not it is essential to provide the participants with '**Information**' prior to their attendance of the structured interaction session in the process stage (see below). The provision of a ranking/response form for the topic and questions to be discussed may be considered at this stage.

In this study, the topic is to establish consensus agreement on statements regarding the role of occupational therapy for children with ADHD. The statements are developed according to current research evidence and author's clinical experience. In order to get wider representation, 72 paediatric occupational therapists were involved in the study. They attended a study day on ADHD as part of their continuing professional development. The consensus development section was scheduled in the afternoon of the study day. There were three study days, two in London and one in Edinburgh with 24 therapists attending per day. All participants were provided with the following three articles and also a consensus form (see **Appendix C**) to do the first round of ranking in their own time.

1. Occupational Therapy for Children with ADHD: a survey on the level of involvement and training needs of therapists (Chu, 2003a).

Figure 5.1: The Structure and Procedures of the Consensus Development Method used in this Research Study

(adapted from Murphy et al, 1998 and Jones and Hunter, 2000).



2. Attention Deficit Hyperactivity Disorder (ADHD), Part One: A Review of Literature (Chu, 2003b).
3. Attention Deficit Hyperactivity Disorder (ADHD), Part Two: Evaluation and Intervention (Chu, 2003c).

Process Stage

In this stage, participants attend a structured interaction session based on the method selected. The researcher / facilitator explains to the participants the structure of the session, the ground rules of the group discussion and also the procedures involved in reporting individual scores. Although this is not a standard procedure, further information on the topic can be presented so that all participants have a common ground of knowledge on the topic.

In this study, formal lectures on ADHD were delivered with the use of video presentation. For the structured interaction, the two-round ranking process of the NGT was selected, as it is well adapted to the achievement of consensus agreement within a short timescale. Firstly, each participant recorded his or her scores independently on the consensus form. They then transferred the scores to different visual charts used for different areas of role statements. The facilitator summarised the result of each role statement. The group then discussed each idea in turn. Participants then privately recorded their judgements and fed back the scores in the second round of the visual charts. The facilitator also collected verbal data during the group discussion. At the end of the session, the facilitator summarised the results and collected all the consensus forms from participants.

Outputs Stage

In the last stage, both written and verbal data collected will be analysed to derive the group judgement. In this study, the results are reported in different tables with the scores on the first and second rounds presented in terms of frequency and percentage of responses. Results from the second round will be integrated into the formulation of a model of practice in occupational therapy for children with ADHD.

THE PROPOSED ROLE OF OCCUPATIONAL THERAPY FOR CHILDREN WITH ADHD

Given a wide range of research evidence outlined in Chapter 2, results of the national survey reported in Chapter 4 and also the clinical experience of the author, the role of occupational therapy can be conceptualised in the following aspects of multi-dimensional evaluation and multi-faceted intervention of children with ADHD (see below). The proposed role of occupational therapy for children with ADHD will be used to create a consensus form for this study (see **Appendix C**).

Occupational Therapist as an Active Member of a Team

As indicated in Chapter Two on literature review, children with ADHD have impairments in such disparate domains as schoolwork, peer relationships, family functioning, self-regard, and also present with comorbid symptomatology (Barkley, 1996). A team approach is essential to implement a multi-dimensional diagnostic protocol and multi-faceted intervention programme (Chu, 2003c). The occupational therapist could function as a generic worker in carrying out initial screening and also a specialist in implementing specific assessment and treatment protocols for children with ADHD.

Role of Occupational Therapy in the Evaluation and Diagnosis of ADHD

According to Whalen and Henker (1996), each ADHD child has a unique constellation of problems and multiple domains of functioning may be affected. Therapists need to have good knowledge on the diagnostic criteria, which are the basis for making formal diagnosis. The comprehensive evaluation carried out by an occupational therapist could help to confirm or refute the diagnosis of ADHD, make differential diagnosis, differentiate the subtypes of ADHD, identify comorbid conditions and underlying reasons for the presenting ADHD features, and ascertain the child's level of functioning in different areas of development.

The therapist needs to explore the presenting symptoms and the history of those symptoms. It is also important to assess the child's current functioning in a variety of settings; current mental status; and the presence of other disorders that may be either the principal underlying disorder or a comorbid disorder that affects the child (Quinlan, 2000). Many studies have found that over 50% of individuals

diagnosed with ADHD also meet the diagnostic criteria for one or more additional psychiatric and developmental disorders (Tannock, 1998 and Brown, 2000). The failure to identify comorbid conditions remains one of the most frequent causes of misunderstanding and incorrect treatment (Accardo, 1999).

Occupational Therapy Assessment Areas within the Multi-Dimensional Evaluation of ADHD

The processes of occupational therapy evaluation could include the following assessment procedures and areas:-

Direct Formal Assessment. Occupational therapists could use different rating scales to identify the behavioural pattern related to ADHD i.e. inattentiveness, hyperactivity, impulsivity, inhibitory control and executive dysfunctions (Chu, 2003c). In terms of foundation abilities and functional skills, therapists need to focus on the assessment of the child's sensory processing functions, perceptual processing functions, praxis, motor control and motor skills, different performance skills (e.g. handwriting), and functional skills (e.g. self-care skills and participation in play, leisure and social activities).

Interview and Observation. The evaluation process should also include careful history taking and observation, including information on family structure and home environment. The therapist should observe the interaction between parent and child to evaluate the symptoms of ADHD (Greenhill, 1998). It is important to assess the child's psychosocial function e.g. emotional state, level of self-esteem, peer-group relationship. The therapist should observe the child's engagement in different occupations within different environments that pose a challenge to the child e.g. nursery, school.

Review Information. Information from other professionals e.g. child psychiatrists, psychologists, teachers is valuable in the overall interpretation of the child's behavioural and functional profiles. Sharing information with other professionals involved helps to facilitate a team approach, avoid duplication of work and also helps to coordinate an integrated package of care. Other social and cultural factors should also be considered in the whole evaluation process.

Role of Occupational Therapy in the Multi-faceted Intervention of ADHD

Because of the complexity of the condition, the concept of a multi-faceted treatment model is advocated to cover different aspects of the disorder (Chu, 2003c). Occupational therapy intervention emphasises the remediation of underlying sensory-perceptual-motor dysfunctions, the development of self-regulation for adaptive behaviour, the acquisition of developmental skills, and adaptations to promote functional performance in natural environments e.g. home and school (Hanft, 1997). Although the treatment strategies discussed below are not completely occupation-based, they are facilitatory strategies to enable the child with ADHD to engage in different tasks and participate in different occupations. In routine practice, paediatric occupational therapists often use play activity as a treatment medium within these facilitatory strategies in order to engage the child in the intervention process. Through play activities, the child can better self-organise himself/herself in different occupations (Parham & Primeau, 1997). Occupational therapists could contribute to the following facets of intervention:-

Parent and teacher education / training e.g. to promote the understanding of a child with ADHD, and to equip parents/teachers with necessary skills for managing the specific behavioural problems.

Environmental adaptation e.g. to provide advice on adapting and modifying the classroom and home environment in order to promote the child's functioning within these environments e.g. seating position within classroom, calming colour scheme and layout of the child's bedroom.

Behavioural and psychological management e.g. to develop desirable behaviours by using different positive reinforcement and behaviour reduction strategies.

Contribute to the prescription of medication and monitor the effects and side-effects e.g. to help to make decisions about the use of medication and also monitor the effects and side effects of the medication treatment provided to the child, and provide accurate and timely feedback to the child's medical consultant.

Educational management e.g. to provide advice to teachers on effective classroom organisation, curriculum modification and performance-promoting strategies.

Social skills training e.g. to promote the acquisition of appropriate social interactive behaviour by using structured social skills training programme.

Remediation of underlying dysfunction e.g. to reduce the impacts of different sensory, perceptual and motor dysfunctions which may be the cause of different ADHD features or academic underachievement.

Direct training in functional skills e.g. to enhance the child's acquisition of different skills which are essential for successful participation in different occupations, e.g. handwriting tasks, dressing tasks, play and social activities.

Education and Training

Occupational therapists could be involved in disseminating information to different groups of people e.g. general public, parent groups, school staff, professional groups, senior managers and commissioners of services. This would help to promote the understanding of the condition and correct any gross misconceptions. It is important to reframe the view of the ADHD child from that of a naughty, lazy child who could behave normally if he or she wanted to, to that of a child struggling to deal with a disability outside his or her complete control.

Research

Occupational therapists could be involved in research studies in order to validate the theory and the construct of ADHD, develop guidelines for making differential diagnosis, delineate different phenotypes and comorbid conditions, develop valid and reliable evaluation tools, and evaluate the efficacy of different treatment methods.

PURPOSE OF THE STUDY

In order to achieve consensus on the role of occupational therapy for children with ADHD, three clinical fora were conducted using the structure of consensus development method described. The research questions and objectives are:-

Research Questions:-

1. How do occupational therapists perceive their role in the assessment and diagnosis of children with ADHD?
2. What core areas of multi-faceted intervention could be carried out by occupational therapists in the management of children with ADHD?
3. Do occupational therapists perceive themselves to have a role to play in the areas of education/training of parents, teachers, and other professionals?
4. Should occupational therapists be involved in different areas of research in ADHD?

Research Objectives:-

1. To achieve consensus on the role of occupational therapy for children with ADHD.
2. To use information generated to contribute to the development of a model of practice and also an evidence-based, family-centred, occupational therapy care package with written protocol of evaluation and intervention for children with ADHD.

METHOD

Research Design

A structure of consensus development method was selected based on the conceptual model developed by Murphy et al (1998) (see Table 5.1). The procedures of the method will be further explained below. Participants were brought together for discussion sessions led by the author who acted as a facilitator.

Sample of Participants

The participants of the study were a convenient sample of 72 occupational therapists who attended a study day on ADHD. They were therapists who responded to a circular for the ADHD study days distributed through the regular membership mailing of the National Association of Paediatric Occupational Therapists (NAPOT). The attendance of the study day was part of their professional training and development. It was specified in the circular that participants of the study days would also have the opportunity of being involved in the consensus development research. It was emphasised that their participation was entirely voluntary and that they could withdraw at any time during the NGT session. There were in total three study days (two in London and one in Edinburgh) and 24 participants on each study day. The participants were mostly occupational therapists who worked within a community child health service. There were few occupational therapists who worked within a child psychiatry setting. The consensus development session was scheduled in the afternoon, and lasted about two hours. Participants had been given information on the purpose of the study and also the methodology used prior to their attendance of the study day. They did not have to take part if they did not want to be involved.

Data Collection Instrument

A consensus form was developed based on the proposed role of occupational therapy outlined previously (see **Appendix C**). There were a total of 6 sections on team approach, evaluation and diagnosis, assessment areas, multi-faceted intervention, education and training, and research. Each session had different numbers of statements, which described the role of occupational therapy for children with ADHD. A Likert scale of 1 to 5 was used to rate each statement from “Strongly Disagree” (1) to “Strongly Agree” (5). The Likert scale was used as it had been recognised as the easiest and most reliable scaling technique (Maranell, 1974). For the sections on assessment areas and multi-faceted intervention, participants were asked to select the top six priorities of assessment and top five priorities of intervention that should be carried out by occupational therapists. The author’s decision to limit the number of priorities of assessment to

six and the priorities of treatment to five was taken in light of the time and resources available. At the end of the consensus, there was also space for participants to write additional comments.

During the consensus development session, all participants were given different coloured stickers for them to record their scores on six different visual charts. Different coloured stickers were used for different sections, also for round one, and round two of the consensus form. At the end of the session, the facilitator collected all the consensus forms from the participants for final data analysis. Additional comments and points of discussion during the session were also recorded. This will be reported under the section of "Results".

Data Collection Procedures

The structure of the consensus development method consisted of the following procedures:

INPUTS STAGE: BEFORE THE STUDY DAY

1. An article on the results of the National Survey (Chu, 2003a) and reviews of the relevant literature (Chu, 2003b, & c) were provided to participants before the meeting.
2. Participants generated ideas in scoring the first round of the consensus form on their own at home.

PROCESS STAGE: DURING THE STUDY DAY

3. In the morning session and first half of the afternoon session of the Study Day, updated evidence-based information on ADHD was presented. It included information on the historical perspective of the condition, clinical features, diagnostic criteria, processes of differential diagnosis and identification of comorbidity, multi-dimensional evaluation and multi-faceted intervention strategies. This helped to integrate evidence-based information in the whole decision-making process in defining the role of occupational therapy for children with ADHD.
4. In the second half of the afternoon session, the facilitator explained the process of the consensus development method (5 minutes).
5. Each participant recorded the first round scores they did privately on the visual charts by using different coloured stickers provided (20 minutes).
6. The facilitator clarified and discussed each score on the chart with reference to available research evidence for clinical practice (20 minutes).
7. Break (15 minutes).

8. Participants were divided into small groups of 6 members to discuss the first round scoring (20 minutes).
9. Each participant then scored the second round of the consensus form and recorded it on the visual charts (20 minutes).
10. The facilitator reviewed the voting in the second round scores and summed up the results (20 minutes).
11. The facilitator collected all the consensus forms and verbal data generated during the group discussion.

OUTPUTS STAGE: AFTER THE STUDY DAY

12. The facilitator analysed both written and verbal data collected.
13. The facilitator summarised responses in frequency and percentages and presented the results in different tables.
14. The facilitator integrated the results into the developing model of practice.

Data Analysis

Data collected were analysed by using the Statistical Package for Social Sciences (SPSS) – Version 12 (Norussis, 2003). Descriptive statistical techniques were used in order to quantify the responses in terms of frequency and percentage. These descriptive statistical techniques are useful in order to analyse and describe the data. Data analysed were organised into different tables as reported in the next section.

RESULTS

The results of the consensus in different areas were analysed and reported in different tables which show the results of the first round and also the second round ratings by all the participants. The shaded figures in the tables highlight the highest score for a particular statement. This provides a visual presentation on the shift of scores within first round and second round ratings. The results of the second round ratings were used to draw the conclusions for this study. They also served as a foundation for the development of the model of practice and package of care for the final stage of research on outcome study.

Consensus Statement on The Team Approach

As illustrated in **Table 5.1** there was a consistent change in the opinions of most

therapists in all statements under the “Team Approach”. There was a high percentage of therapists who believed that occupational therapists should be an active member of a team or service (97.2%), involved in multi-dimensional evaluation (97.2%) and multi-faceted intervention (94.4%), and also in research (88.9%) concerning children with ADHD. Although the majority of participants either agreed or strongly agreed that occupational therapists could work as a generic worker or a specialist, and be involved in initial screening of children with ADHD, the ratings for “strongly agree” were relatively lower than other statements i.e. 61.1% and 62.5% respectively.

Consensus Statement on Evaluation and Diagnosis

In this section, there was also a consistent shift in the opinions of most participants in the second round of the rating in respect to the role of occupational therapists in the processes of evaluation and diagnosis (see Table 5.2). Most participants “Strongly Agreed” that occupational therapists should be familiar with ADHD diagnostic criteria (88.9%), that they could help to identify comorbid conditions (88.9%), and could ascertain the child’s level of abilities in different functional skills (100%). Over half of the participants strongly believed that occupational therapy evaluation could help to confirm or refute the diagnosis of ADHD (65.3%), make differential diagnosis (68.1%), identify the three subtypes of ADHD (55.6%), and identify the underlying reasons for hyperactivity, inattentiveness and impulsivity (62.5%).

Consensus Statement on Assessment Areas

There was no major shift in the pattern of scoring in round one and round two though most participants did agree that occupational therapists should be involved in different areas of assessment for children with ADHD (see Table 5.3). The only area of change was in the assessment of behavioural patterns of ADHD i.e. from 62.5% of “Agree” and 22.2% of “Strongly Agree” in round one to 41.7% of “Agree” and 54.2% of “Strongly Agree” in round two. There were also substantial increases in the percentage of “Strongly Agree” in the assessment areas of school factors (from 52.8% to 77.8%) and neurological basis of ADHD (from 52.8% to 91.7%).

Table 5.1: Consensus Statements on The Team Approach

STATEMENTS ON THE TEAM APPROACH	FIRST ROUND RATING (N = 72)										SECOND ROUND RATING (N = 72)									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Occupational therapist should be an active member of a team or service for children with ADHD.	0	0	0	0	0	0	13	18.1	59	81.9	0	0	0	0	0	0	2	2.8	70	97.2
Occupational therapist could work as a generic worker or a specialist within a team for children with ADHD.	0	0	3	4.2	9	12.5	38	52.8	22	30.6	0	0	0	0	3	4.2	25	34.7	44	61.1
Occupational therapist should be involved in the initial screening of children with ADHD.	0	0	2	2.8	1	13.9	33	45.8	27	37.5	0	0	0	0	2	2.8	25	34.7	45	62.5
Occupational therapist should be involved in the multi-dimensional evaluation of children with ADHD.	0	0	0	0	1	1.4	29	40.3	42	58.3	0	0	0	0	0	0	2	2.8	70	97.2
Occupational therapist should be involved in the multi-faceted intervention programme for children with ADHD.	0	0	0	0	0	0	26	36.1	46	63.9	0	0	0	0	0	0	4	5.6	68	94.4
Occupational therapist should be involved in research on children with ADHD.	0	0	0	0	2	2.8	24	33.3	46	63.9	0	0	0	0	1	1.4	7	9.7	64	88.9

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

Table 5.2: Consensus Statements on Evaluation and Diagnosis

STATEMENTS ON EVALUATION & DIAGNOSIS	FIRST ROUND RATING (N = 72)										SECOND ROUND RATING (N = 72)									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Occupational therapist should be familiar with the DSM-IV and ICD-10 diagnostic criteria on ADHD and Hyperkinetic Disorder.	0	0	0	0	2	2.8	31	43.1	39	54.2	0	0	0	0	0	0	8	11.1	64	88.9
Occupational therapy evaluation can help to confirm or refute the diagnosis of ADHD.	0	0	0	0	7	9.7	39	54.2	26	36.1	0	0	0	0	0	0	25	34.7	47	65.3
Occupational therapy evaluation can help to make differential diagnosis i.e. differentiate conditions that mimic ADHD.	0	0	2	2.8	9	12.5	33	45.8	28	38.9	0	0	0	0	1	1.4	22	30.6	49	68.1
Occupational therapy evaluation can help to identify the three subtypes of ADHD.	0	0	1	1.4	16	22.2	37	51.4	18	25.0	0	0	0	0	1	1.4	31	43.1	40	55.6
Occupational therapy evaluation can help to identify comorbid conditions and associated problems e.g. DCD.	0	0	0	0	2	2.8	24	33.3	46	63.9	0	0	0	0	0	0	8	11.1	64	88.9
Occupational therapy evaluation can help to identify the underlying reasons for hyperactivity, inattentiveness and impulsivity.	0	0	2	2.8	8	11.1	36	50.0	26	36.1	0	0	0	0	2	2.8	25	34.7	45	62.5
Occupational therapy evaluation can help to ascertain the child's level of abilities in different functional skills e.g. handwriting.	0	0	0	0	0	0	14	19.4	58	80.6	0	0	0	0	0	0	0	0	72	100.0

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

Table 5.3: Consensus Statements on Assessment Areas (to be continued on next page)

Occupational therapist should be involved in the following areas of assessment:-	FIRST ROUND RATING (N = 72)										SECOND ROUND RATING (N = 72)									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Family structure and home environment, including relationship and interactions between different family members.	0	0	3	4.2	24	33.3	36	50.0	9	12.5	0	0	2	2.8	10	13.9	45	62.5	15	20.8
Parenting skills. Parental expectation, attitudes and understanding.	0	0	3	4.2	18	25.0	42	58.3	9	12.5	0	0	1	1.4	4	5.6	50	69.4	17	23.6
Birth, developmental, medical history and incidence of significant life events e.g. bereavement.	0	0	3	4.2	20	27.8	41	56.9	8	11.1	0	0	3	4.2	9	12.5	45	62.5	15	20.8
Social and cultural factors e.g. ethnicity, belief, and spirituality.	0	0	2	2.8	25	34.7	38	52.8	7	9.7	0	0	1	1.4	12	16.7	42	58.3	17	23.6
School factors e.g. teaching style, classroom management and size.	0	0	0	0	4	5.6	30	41.7	38	52.8	0	0	0	0	1	1.4	15	20.8	56	77.8
Neurological basis of ADHD e.g. sensory processing function.	0	0	0	0	2	2.8	32	44.4	38	52.8	0	0	0	0	0	0	6	8.3	66	91.7

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

Table 5.3 (continued): Consensus Statements on Assessment Areas

Occupational therapist should be involved in the following areas of assessment:-	FIRST ROUND RATING (N = 72)										SECOND ROUND RATING (N = 72)									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Psychological Basis of ADHD e.g. attention control and executive functions.	0	0	0	0	14	19.4	45	62.5	13	18.1	0	0	0	0	7	9.7	39	54.2	26	36.1
Behavioural pattern of ADHD i.e. hyperactivity, inattentiveness and impulsivity.	0	0	0	0	11	15.3	45	62.5	16	22.2	0	0	0	0	3	4.2	30	41.7	39	54.2
Perceptual-motor and functional skills e.g. visual perception, motor coordination, self-care skills, handwriting skills.	0	0	0	0	0	0	12	16.7	60	83.3	0	0	0	0	0	0	3	4.2	69	95.8
Psychosocial skills e.g. emotional state, level of self-esteem, peer-group relationship.	0	0	1	1.4	6	8.3	43	59.7	22	30.6	0	0	0	0	2	2.8	37	51.4	33	45.8
Learning abilities and communication skills.	0	0	5	6.9	18	25.0	43	59.7	6	8.3	0	0	3	4.2	14	19.4	42	58.3	13	18.1

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

The Top Six Priorities of Assessment

In this section, participants were asked to identify the top six priorities of assessment which should be included in the occupational therapy evaluation. There was a stable and consistent rating in round one and two (see **Table 5.4**).

The top six priorities of assessment, according to participants, were:

1. Perceptual-Motor and Functional Skills (98.6%).
2. Neurological Basis of ADHD e.g. Sensory Processing Function (97.2%).
3. School Factors (94.4%).
4. Psychosocial Skills (73.6%).
5. Behavioural Patterns of ADHD (66.7%).
6. Psychological Basis of ADHD (55.6%).

Consensus Statement on Multi-faceted Intervention

There was a partial shift in the pattern of scores in round one and round two (see **Table 5.5**). Overall, there was a strong agreement that occupational therapists should be involved in all areas of the multi-faceted intervention for children with ADHD. There were significant changes of scores in the intervention areas of parental education and training (from 45.8% of “Strongly Agree” to 77.8% of “Strongly Agree”), medication treatment (from 44.4% of “Neither Disagree nor Agree” in round one to 62.5% of “Agree” in round two), and educational management (from 27.8% of “Strongly Agree” in round one to 58.3% of “Strongly Agree” in round two). The intervention areas of environmental adaptation, remediation of sensory integrative dysfunction and remediation of developmental and functional problems obtained the highest level of agreement, i.e. all scored 91.7% for “Strongly Agree” in round two.

The Top Five Priorities of Intervention

In this section, participants were asked to select the top five priorities of intervention in which occupational therapists should be involved (see **Table 5.6**). There was a relatively stable pattern in the selection in round one and two, except for the change of social skill training to educational management in round two.

Table 5.4: The Top Six Priorities of Assessment

Areas of assessment which occupational therapists should be involved:-	FIRST ROUND RATING (N = 72)				SECOND ROUND RATING (N = 72)			
	NO		YES		NO		YES	
	f	%	f	%	f	%	f	%
Family structure and home environment, including relationship and interactions between different family members.	46	63.9	26	36.1	54	75.0	18	25.0
Parenting skills. Parental expectation, attitudes and understanding.	46	63.9	26	36.1	42	58.3	30	41.7
Birth, developmental, medical history and incidence of significant life events e.g. bereavement.	59	81.9	13	18.1	61	84.7	11	15.3
Social and cultural factors e.g. ethnicity, belief, and spirituality.	62	86.1	10	13.9	59	81.9	13	18.1
School factors e.g. teaching style, classroom management and size.	11	15.3	61	84.7	4	5.6	68	94.4
Neurological basis of ADHD e.g. sensory processing function.	8	11.1	64	88.9	2	2.8	70	97.2
Psychological Basis of ADHD e.g. attention control and executive functions.	34	47.2	38	52.8	32	44.4	40	55.6
Behavioural pattern of ADHD i.e. hyperactivity, inattentiveness and impulsivity.	27	37.5	45	62.5	24	33.3	48	66.7
Perceptual-motor and functional skills e.g. visual perception, motor coordination, self-care skills, handwriting skills.	2	2.8	70	97.2	1	1.4	71	98.6
Psychosocial skills e.g. emotional state, level of self-esteem, peer-group relationship.	14	19.4	58	80.6	19	26.4	53	73.6
Learning abilities and communication skills.	52	72.2	20	27.8	62	86.1	10	13.9

Key: NO = Not one of the top six assessment areas f = Frequency of Responses
 ES = One of the top six assessment areas % = Percentage of Responses
 N = Total number of participants

Table 5.5: Consensus Statements on Multi-Faceted Intervention

Occupational therapist should be involved in the following aspects of the multi-faceted intervention for ADHD:-	FIRST ROUND RATING (N = 72)										SECOND ROUND RATING (N = 72)									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Parental education and training.	0	0	0	0	3	4.2	36	50.0	33	45.8	0	0	0	0	1	1.4	15	20.8	56	77.8
Environmental adaptation.	0	0	0	0	2	2.8	20	27.8	50	69.4	0	0	0	0	0	0	6	8.3	66	91.7
Behavioural and psychological management.	0	0	0	0	17	23.6	38	52.8	17	23.6	0	0	0	0	9	12.5	35	48.6	28	38.9
Medication treatment – contributes to the decision making on prescription, provide information to parents, monitor side effects.	5	6.9	9	12.5	32	44.4	23	31.9	3	4.2	0	0	0	0	12	16.7	45	62.5	11	15.3
Educational management.	1	1.4	0	0	7	9.7	44	61.1	20	27.8	0	0	0	0	4	5.6	26	36.1	42	58.3
Social skill training.	0	0	2	2.8	5	6.9	44	61.1	21	29.2	0	0	2	2.8	7	9.7	40	55.6	23	31.9
Remediation of sensory integrative dysfunction as a basis for ADHD.	0	0	0	0	1	1.4	17	23.6	54	75.0	0	0	0	0	1	1.4	5	6.9	66	91.7
Remediation of developmental and functional problems.	0	0	0	0	1	1.4	15	20.8	56	77.8	0	0	0	0	1	1.4	5	6.9	66	91.7

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

Table 5.6: The Top Five Priorities of Intervention

Areas of assessment which occupational therapists should be involved:-	FIRST ROUND RATING (N = 72)				SECOND ROUND RATING (N = 72)			
	NO		YES		NO		YES	
	f	%	f	%	f	%	f	%
Parental education and training.	14	19.4	58	80.6	13	18.1	59	81.9
Environmental adaptation.	7	9.7	65	90.3	3	4.2	69	95.8
Behavioural and psychological management.	43	59.7	29	40.3	45	62.5	27	37.5
Medication treatment – contributes to the decision making on prescription, provides information to parents, monitor side effects.	71	98.6	1	1.4	71	98.6	1	1.4
Educational management.	39	54.2	33	45.8	28	38.9	44	61.1
Social skill training.	35	48.6	37	51.4	47	65.3	25	34.7
Remediation of sensory integrative dysfunction as a basis for ADHD.	5	6.9	67	93.1	4	5.6	68	94.4
Remediation of developmental and functional problems.	2	2.8	70	97.2	5	6.9	67	93.1

Key: NO = Not one of the top five intervention areas f = Frequency of Responses
 YES = One of the top five intervention areas % = Percentage of Responses
 N = Total number of participants

The top five priorities of intervention, according to participants, were:-

1. Environmental Adaptation (95.8%).
2. Remediation of Sensory Integrative Dysfunction as a basis for ADHD (94.4%).
3. Remediation of Developmental and Functional Problems (93.1%).
4. Parental Education and Training (81.9 %).
5. Educational Management (61.1%).

Consensus Statement on Education and Training

There was a shift in the pattern of scores in round one and round two (see **Table 5.7**). The scores for all areas of education and training are relatively consistent, with the highest “Strongly Agree” score of 79.2% in educating the general public, parents and school staff.

Consensus Statement on Research

There was also a shift in the pattern of scores in round one and round two (see **Table 5.8**). The area of research that scored the highest was the evaluation of efficacy of different treatment methods i.e. 90.3%.

Additional Comments and Points of Discussion

During the NGT sessions, different participants made additional comments and points as summarised below:-

- The exact role of occupational therapists would be dependent on what other professionals involved in the team did in relation to these children, and also roles of individuals within team.
- Therapists who work from a psychodynamic frame of reference have different thinking from therapists who work within a neurodevelopmental frame of reference.
- Occupational therapists working within CAMHS were likely to need extra training in the assessment and treatment of sensory integrative dysfunctions, perceptual and motor dysfunctions, so that they could assess and treat these areas of functions usually covered by paediatric occupational therapists.

Table 5.8: Consensus Statements on Research

Occupational therapist should be involved in research in order to:-	FIRST ROUND RATING										SECOND ROUND RATING									
	1		2		3		4		5		1		2		3		4		5	
	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%	f	%
Validate the theory and construct of ADHD.	0	0	2	2.8	10	13.9	40	55.6	20	27.8	0	0	2	2.8	3	4.2	29	40.3	38	52.8
Delineate different phenotypes and comorbid conditions.	1	1.4	3	4.2	24	33.3	27	37.5	17	23.6	0	0	2	2.8	5	6.9	33	45.8	32	44.4
Develop guidelines in making differential diagnosis.	0	0	3	4.2	17	23.6	31	43.1	21	29.2	0	0	0	0	2	2.8	30	41.7	40	55.6
Develop valid and reliable evaluation tools.	0	0	0	0	3	4.2	28	38.9	41	56.9	0	0	0	0	2	2.8	16	22.2	54	75.0
Evaluate the efficacy of different treatment methods.	0	0	0	0	1	1.4	13	18.1	58	80.6	0	0	0	0	1	1.4	6	8.3	65	90.3

Keys for Rating: 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree
 N = Total number of participants f = Frequency of Responses % = Percentage of Responses

- Working with children with ADHD highlighted the need for combined occupational therapy skills in CAMHS and Child Health Services.
- Experience and confidence in current skill level undoubtedly affected participants in the way they scored different role statements in different sections.
- Some therapists worried about a possible surge in referral numbers on services that were already struggling to cope if the role of occupational therapy for children with ADHD is promoted.

Some relevant written comments made by several participants reflected the above issues under discussion:

“For the first round ratings, I rated according to my role as an occupational therapist in CAMHS (adolescents) so I realised that I missed out some of the major occupational therapy roles in paediatric!”

“Before today I did not realise how important the occupational therapy role was for assessment and treatment of children with ADHD. The implication that an undiagnosed ADHD child may develop other psychiatric difficulties shows that there is a high risk of deterioration. However, unlike a physical deterioration that is clearly apparent & visibly upsetting, this is a hidden deterioration. This is much more concerning.”

“Our area of difficulty is securing funding for an occupational therapist in CAMHS as they are using resources to help children with acute psychiatric conditions. Hopefully this piece of work will help us to continue pushing for this role.”

“Following discussion today, the most valid point for me was the need for occupational therapists to promote uniqueness within a team.”

DISCUSSION

Role Statements on the Team Approach

Results of rating in this area highlighted the consistent agreement of most participants that the occupational therapist should be an active member of a team or service for children with ADHD, involved in multi-dimensional evaluation, multi-faceted intervention and research on children with ADHD. The only two statements with a relatively lower score are related to working as a generic worker or a specialist, and involving in initial screening of children with ADHD. During the post first-round discussion on the overall ratings, participants elaborated that the functions and service delivery model adopted by the departments where they work will affect their roles related to these two statements. For example, therapists working in community child health services were seldom involved in initial screening of children as this is usually done by the consultant paediatrician though they all agreed that occupational therapists could have a role to play in developmental screening of children.

Another issue was related to occupational therapists who work within a CAMHS as some of them were employed as a generic worker rather than a specialist occupational therapist. They may use their occupational therapy skills in generic work but seldom carry out specific occupational therapy assessment and treatment for the child's presenting problems in different sensory, perceptual and motor functions. Some occupational therapists working in CAMHS highlighted that the exact role of occupational therapists would be dependent on what other professionals involved in the team did with these children and also roles of individuals within the team. Overall, a high level of agreement was achieved. As stated, one participant commented that it is important for occupational therapists to promote uniqueness within a team.

Role Statements on Evaluation and Diagnosis

Experience and confidence in current skill levels undoubtedly affected the way participants scored different role statements in different sections. This was clearly demonstrated in this section of ratings. There is nearly a 40% increase in the rating

of “Strongly Agree” in most of the role statements on evaluation and diagnosis, except in the two statements on identifying comorbid conditions and associated problems (e.g. DCD), and also ascertaining the child’s level of abilities in different functional skills (e.g. handwriting skills). This was most likely related to the lack of knowledge of specific occupational therapy evaluation and its contribution in the whole process of making differential diagnosis, confirming diagnosis, differentiating subtypes of ADHD, and also identifying the underlying reasons for ADHD features. It is not surprising that one participant did not realise how important the occupational therapy role was for assessment and intervention of children with ADHD before attending the study day. The two statements with less increase in rating of “Strongly Agree” reflected the consistent perception of the role of occupational therapy in the assessment of motor performance and functional skills.

Role Statements on Assessment Areas

The ratings for the first and second round were quite consistent except in the three role statements on assessment of behavioural pattern, school factors and neurological basis of ADHD. There were obvious increases in the score of “Strongly Agree” in these three role statements as some of the participants realised that they were important areas of assessment within the multi-dimensional evaluation model of ADHD after the presentation in the morning and also group discussion before the second round rating. These three areas of assessment were also identified as part of the top six priorities of assessment.

For the top six priorities of assessment, it was not surprising that assessment of perceptual-motor and functional skills was the top area, as it is a common domain of concern in traditional paediatric occupational therapy practice. All the top six priorities of assessment constitute the major components of a multi-dimensional evaluation model of children with ADHD (Chu, 2003c). This is also consistent with the model of etiological factors of ADHD described in Chapter Two on Literature Review (see Figure 2.2).

During the post first-round discussion on the overall ratings, some participants commented that the areas of assessment that could be done by occupational therapists were different in different service settings or teams. It also depended on the skill level of the therapist. For example, the assessment of family structure, parenting skills, birth and developmental history could be common roles of a family therapist and a child psychiatrist, while the assessment of behavioural patterns and psychological basis of ADHD could be done by clinical psychologist. An occupational therapist who has completed post-graduate training in sensory integrative evaluation will be able to evaluate the neurological basis of ADHD. It was agreed that a team approach of assessment is important to make accurate diagnosis of ADHD. These extra insights are useful as they support the consensus process of sharing experience and different viewpoints.

Role Statements on Multi-faceted Intervention

The three intervention areas with the highest level of agreement (i.e. environmental adaptation, remediation of sensory integrative dysfunction and remediation of developmental and functional problems) reflected the traditional paediatric occupational therapy practice within a child health service setting. They were also part of the top five priorities of treatment identified by the participants. However, this was not consistent with the practice of some occupational therapists who work within a CAMHS setting. Some CAMHS therapists commented that they tended to focus treatment on family issues, the child's emotional problems, psychosocial skills and also behavioural management.

The change in score on medication treatment was mainly related to the initial misinterpretation of this role statement by some therapists. Rather than contributing to the decision making and also monitoring of side effects, they wrongly assumed that occupational therapists prescribed medication as part of the treatment. The other changes of score in the treatment areas of parental education and educational management highlighted the shift of thinking about the impact of environmental factors on the child's behaviour and functions. These issues, parental education and educational management, were selected by the participants as part of the top five priorities of intervention within a multi-faceted intervention model.

Role Statements on Education and Training

Although all the scores in round two were relatively consistent, it was illuminating to see the shift in scores in round one and round two. After the post round-one discussion, participants changed their scores in the role statement on educating health professional groups as they realised the importance of promoting inter-professional collaboration if they all have the common knowledge base. The change in the score on educating senior managers and commissioners of services reflected the need to influence individuals who have power in allocating resources. One participant expressed difficulties in securing funding for an occupational therapy post in the CAMHS. Hopefully research evidence generated in this PhD study will help other occupational therapists to develop the services locally. Some therapists worried that a possible surge in referral numbers would mean that they could not cope with the demand if the role of occupational therapy for children with ADHD is promoted.

Role Statements on Research

The highest score on research was in the area of evaluating the efficacy of different treatment methods i.e. 90.3%. This was not surprising as the profession is striving to promote evidence-based practice. Therefore, it is extremely important to establish research data to support clinical practice. The second highest score was in the area of developing valid and reliable evaluation tools i.e. 75.0%. This was mainly related to the fact that most of the assessment tools used by paediatric occupational therapists were developed by professionals in North America. Therefore, it is essential to develop evaluation tools with local norms so that the results of assessment will be more valid and reliable.

The Practice of Paediatric Occupational Therapists and CAMHS

Occupational Therapists

It was very clear during all consensus development sessions that there were different ways of working for paediatric occupational therapists within a child health service setting compared with occupational therapists working within a CAMHS setting. This was not just because of different functions and service delivery models but because there are fundamental differences in theoretical

orientation. It became clear in the open discussion that therapists who worked from a psychodynamic frame of reference had different thinking from therapists who worked within a neurodevelopmental frame of reference. Participants recognised that working with children with ADHD highlighted the need for combined occupational therapy skills in CAMHS and paediatrics. It was acknowledged by some occupational therapists working within CAMHS that they needed extra training in the assessment and treatment of sensory integrative dysfunctions, perceptual and motor dysfunctions so that they could assess and treat these areas of functions usually covered by paediatric occupational therapists. It is clear that the integration of specific skills between “physical paediatric” and “child psychiatry” occupational therapists will help to develop a holistic clinical practice. A forum should be set up in order to share the skills and knowledge in different areas of therapeutic work covering different orientations. The differences in practice uncovered during the consensus development session highlighted the advantage of the group approach versus the single “expert” opinion. It actually added value in the whole process of consensus development.

Critical Evaluation of the Consensus Development Method Used in this Study

Jones & Hunter (2000) suggested that consensus development methods should be regarded as methods for structuring group communication on a question, rather than as a means for providing definitive answers. They highlighted that the output from consensus development method is rarely an end in itself. As with any consensus development methods, the structure and procedures used in this study have advantages and disadvantages, especially related to the two-round ranking and discussion components adapted from the NGT (Sample, 1984). Some of the advantages are that voting is anonymous and there are equal opportunities for participation. Also, distractions inherent in other group methods (e.g. Focus Group) are minimised. Controlling the interaction so that all participants have the opportunity to express their view is believed to reduce the dominance of the discussion by one or two vocal members. As to disadvantages, all opinions may not present in the final voting process, and also cross-fertilisation of ideas generated during group discussion may be constrained. The whole process may appear to be too mechanical by just counting the number of responses. However,

this is compensated for by recording qualitative information emerging during the session and also by introducing small group discussion before the second round of rating.

Another potential factor that could affect the outcome is related to the transference of the facilitator's opinions to the participants during the analysis of the ratings in the first round. This might have changed some participants' perspective on the ratings on different statements. For example, one participant stated that she rated in the first round according to her role as an occupational therapist in CAMHS but realised she had missed out some of the major occupational therapy roles in paediatric. One can argue that the facilitator had actually helped some participants to acquire new knowledge by presenting evidence-based information. The educational experience provided in the morning actually added value in the whole consensus process. It helped them to shape and develop their opinions rather than changing their opinions.

From the analyses of the results described, it became clear that the small group discussion scheduled during the consensus development session had helped facilitate sharing of experience and different viewpoints. This demonstrated the advantage of the group approach over and above the single "expert" opinion. At the end, each participant still scored their own ratings on each role statement based on their understandings and opinions at that point in time, whether or not they agreed or disagreed with the majority. This variance of opinions was still evidenced in the distribution of scores of ratings reported in different tables. Another way to check whether or not the facilitator had influenced participants was to examine the shift in scores of rating in round one and round two. Although there were shifts in scores in all areas, they were mainly related to the scores of 4 "Agree" and 5 "Strongly Agree". On the whole, the participants still agreed consistently on the majority of the statements in round one and round two. Overall, the author had confidence that the validity and clinical utility of the data generated were high.

CONCLUSIONS

Through the use of a consensus development method based on the conceptual model developed by Murphy et al (1998), general consensus on the role of occupational therapy for children with ADHD was established in the areas of team approach, evaluation and diagnosis, assessment areas, multi-faceted intervention, education and training, and research. Most areas had a high level of agreement either in the categories of “Agree” or “Strongly Agree”.

In order to identify the key role of occupational therapists in the processes of assessment and treatment, participants were asked to select the top six priorities of assessment and the top five priorities of treatment for children with ADHD. The top six priorities of assessment identified were: Perceptual-Motor and Functional Skills (98.6%), Neurological Basis of ADHD e.g. Sensory Processing Function (97.2%), School Factors (94.4%), Psychosocial Skills (73.6%), Behavioural Patterns of ADHD (66.7%), and Psychological Basis of ADHD (55.6%). The top five priorities of intervention identified were: Environmental Adaptation (95.8%), Remediation of Sensory Integrative Dysfunction as a basis for ADHD (94.4%), Remediation of Developmental and Functional Problems (93.1%), Parental Education and Training (81.9 %), and Educational Management (61.1%). These areas of assessment and treatment should be implemented within a framework of a family-centred care approach as it was recognised that empowering and enabling parents are effective in making changes in the child’s behavioural patterns.

It was obvious in the qualitative data and information generated during the open discussion that there were clear differences in the practice between paediatric occupational therapists working in child health settings and occupational therapists working in CAMHS settings. The integration of skills in these two practice areas is important in order to develop a holistic approach when supporting children with ADHD. It was highlighted that, in certain settings, the constitution of the team and also role of each team member could affect the role of the occupational therapist within a team or service for children with ADHD. There was also debate on the generic and specialist role of occupational therapist, especially within a CAMHS.

Discussion revealed that the educational experience provided to the participants before and during the consensus development session had helped to structure the group communication. It provided them with current research evidence so that they could integrate this into their own experience and knowledge base. It helped them to develop or reshape their opinions rather than changing their opinions. The discussion group helped to facilitate sharing of experience. The differences in opinion and also in clinical practice uncovered during the consensus development session highlighted the advantage of the group approach versus the single “expert” opinion. All these factors actually added value in the whole process of consensus development. Analysis of the shifts of scores in round one and round two indicated that participants were not affected by the opinions of the facilitator as the shifts were mainly between scores 4 “Agree” and 5 “Strongly Agree”. It was concluded that the data obtained had a high level of validity and clinical utility.

Results generated through this piece of structured work were useful in developing and shaping a realistic occupational therapy model of practice for children with ADHD. Further research studies were needed to validate the proposed roles and refine the developing model of practice. The processes are not linear but entail moving back and forth among various phases and steps within phases. It is important to note that the output from consensus development method was rarely an end in itself (Jones & Hunter, 2000). It was only the beginning of a developmental process.

Chapter Six

Formulation of a Model of Practice in Occupational Therapy for Children with ADHD

“A conceptual model is a theoretical framework that explains some phenomena of practical concern. The theoretical arguments are also organised to provide a rationale and methods for therapeutic interventions. Thus, a model has the dual task of explaining a group of phenomena and guiding practice related to those phenomena. It is the combined concern for both theoretical explanation and practical action that make conceptual models of practice unique in their organisation.”

(Kielhofner, 1992, p.81)

INTRODUCTION

In this chapter, an occupational therapy delineation model of practice is presented in order to provide clinical guidelines for understanding the specific psychopathology and management of this disorder from a multi-dimensional perspective. It attempts to go beyond a singular perspective as adopted by some professionals in the field. Information presented in the model is based on the extensive literature review, the author's clinical experience and also data gathered through the research on consensus development reported in Chapter Five. Specific occupational therapy evaluation and intervention procedures within this model of practice will be discussed. The formulated model needs to be further validated through applied research, clinical practice and efficacy studies.

WHAT IS A MODEL OF PRACTICE?

Theoretical frameworks in occupational therapy have often been described using an inconsistent and confusing terminology, e.g. model, paradigm, approach and frame of reference. Kortman (1994) examined all these terms and argued that they are synonyms and that the term 'model' appears to be the simplest to use in relation to theory. He proposed a hierarchy of three models. A **professional model** describes a conceptual framework with broad application in occupational therapy i.e. a professional 'blue print'. In this case, the central theme of this level of model is the concept of occupation. A **delineation model** identifies intervention principles for specific groups of clients and can be conceptualised within a broader professional model. And the last one is an **application model** which is often a specific application of a wider delineation model. Conceptually, a professional model guides clinicians to think like occupational therapists i.e. to view clients as occupational beings and to help them participate successfully in different occupations in order to promote health and development. In clinical practice, we use a delineation model to conceptualise the assessment and treatment principles for a particular client group, while different application models could be used to describe exactly which procedures to use.

The author examined several contemporary professional models in order to draw together the common factors amongst these models i.e. the Occupational

Adaptation Model (Schkade & Schultz, 1992), the Ecology of Human Performance Model (Dunn, Brown and McGuigan, 1994), the Model of Human Occupation (Kielhofner, 1995), and the Person-Environment-Occupation Model (Law, Cooper, Strong, Steward, Rigby and Letts, 1996). All these models discuss the importance of the child, environment, task, and the interaction among these key factors as a means of understanding performance, as well as difficulties with performance, and **participation** in different **occupations** such as activities of daily living (ADL), instrumental ADL, education, work, play, leisure, and social participation. All this is consistent with the recent concept of participation advocated in the new *International Classification of Functioning, Disability and Health* (ICF) published by the World Health Organisation (WHO, 2001). The WHO views participation as the involvement in a life situation. It has a positive impact on an individual's health and well-being.

In order to be consistent with the current thinking about occupational therapy conceptual models, it will be appropriate to apply these common factors (i.e. the child, environment, task, child-environment-task interaction, and participation in different occupations) in developing an occupational therapy delineation model of practice for children with ADHD. As stated, a delineation model generally describes principles to be applied in assessment, and provides guiding constructs for intervention. The client group for which the model is appropriate is designated, as are the types of problems it can be applied to (Kortman, 1994).

When reviewing other occupational therapy literature, it was found that models are also defined as a particular way a profession perceives itself, its connections to other professions, and its relationship to society (Mosey, 1986). Models in occupational therapy build on and integrate interdisciplinary concepts (Kielhofner, 1992). A model provides a perspective of how to think about a problem (Dunn, 2000). Feaver and Creek (1993, p.59) defined 'model' as "a set of theories, applicable in a particular field of practice, which provides an explanation of clinical phenomena and suggests the type of intervention the therapist should make".

In order to gain acceptance, a mode of practice must have certain characteristics (Kielhofner, 1992):-

1. The model has to be formally articulated. Model developers must publish articles and/or books on the model. In some cases, however, model articulation begins with manuals, workshops, and other forms of organising and sharing knowledge.
2. The model must appeal to practitioners. A model appeals when it is simple enough to be understood, yet complex enough to offer some fresh, intriguing insight.
3. The model must be serviceable. Unless the ideas can be applied in some very concrete ways, they are not useful in a practice discipline.

In summary, a delineation model of practice is based on a professional model which emphasises the concept of occupation for health. It builds on and integrates interdisciplinary knowledge, and is applicable in a particular field of practice. It presents and organises a number of theoretical concepts used by therapists in their work. It addresses some specific phenomenon or area of human functioning. A good delineation model of practice gives clear guidelines about what to assess and how to assess it, and states the goals of treatment with clear intervention strategies. Thus, a delineation model has the dual task of explaining a group of phenomena and guiding practice related to those phenomena for a specific client group.

THEORETICAL CONCEPTS OF AN OCCUPATIONAL THERAPY DELINEATION MODEL OF PRACTICE FOR CHILDREN WITH ADHD

Theoretical concepts concerning order, disorder, and therapeutic intervention in a model of practice are the primary theoretical core of occupational therapy. They provide logic, coherence and rationale for the clinical applications of the model (Kielhofner, 1992). The occupational therapy delineation model of practice for children with ADHD is based on the theoretical concepts relating to the child, the environment, the task, the interaction among these key factors, and the child's participation in different occupations. They are generated through different sources of interdisciplinary research evidence discussed in Chapter Two, the author's clinical experience and also basic research conducted by the author.

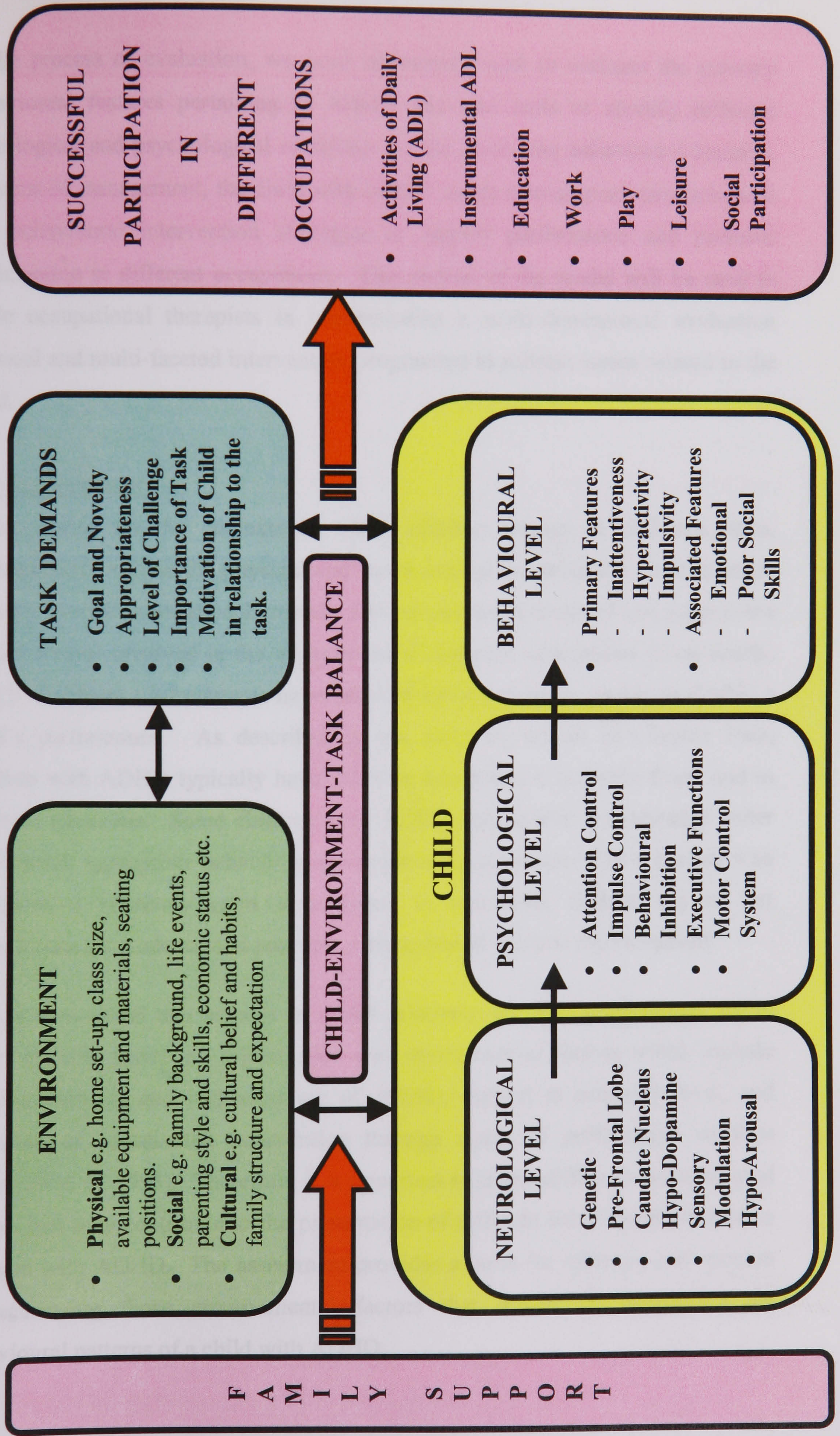
Figure 6.1 illustrates the interaction of these factors within the proposed model. It helps to understand the child's problems at different level of dysfunctions, the effect of different environmental factors, the demands of the task selected, and the child's level of participation in different occupations which are purposeful and meaningful to the children within different situations.

The Child with ADHD

As discussed in the literature review in Chapter Two, there has been a lack of coherence and unified view about the causes of ADHD. As a result, different disciplines tend to focus on different etiological factors of ADHD and advocate different assessment and treatment methods. In order to form the theoretical arguments for reliable evaluation procedures and effective intervention outcomes within occupational therapy practice, the author formulates a model which highlights the interaction between the child and the environment/tasks at different levels of functions (i.e. neurological, psychological and behavioural) by synthesising different research evidence (see Figure 2.2 in Chapter Two). This model on the possible etiological factors of ADHD has been integrated into the proposed delineation model of practice.

Theories about the biological basis of ADHD have suggested that the neuroanatomical location of deficits is in the frontal-basal ganglia and neurochemical disorder involves dopamine pathways, and this results in impaired psychological processes for attention control and behavioural inhibition (Lou, 1996 and Castellanos, 1997). The brain functions as a whole; higher cortical processes require the sensory processing function that occurs at lower subcortical levels; lower subcortical levels depend on cortical functions for interpreting sensory information (Ayres, 1972). Voeller (2001) proposed to broaden the neurological basis of ADHD to include prefrontal-subcortical circuits. One theory is that the frontal lobe, basal ganglia and thalamus form a system or loop which activates and inactivates one or other part of the brain with ascending/arousal and descending/inhibiting pathways (Cummings, 1993). This theoretical assumption links the three levels of functions/dysfunctions as inter-related components in explaining the aetiological factors of ADHD.

Figure 6.1: An Occupational Therapy Delineation Model of Practice for Children with Attention Deficit Hyperactivity Disorder (ADHD)



In the process of evaluation, we need assessment tools to evaluate the primary behavioural features pertaining to ADHD and also tools to identify different neurological and psychological correlates for the presenting behavioural patterns. In terms of management, the child with ADHD needs neurological, psychological and behavioural intervention strategies to support performance and promote participation in different occupations. This section of the model will be used to guide occupational therapists in implementing a multi-dimensional evaluation protocol and multi-faceted intervention programme to address issues related to the child.

The Environment

Environments are the contexts in which children engage in different tasks. Environments include the physical and social settings in which the child operates within a specific cultural background. The environments surround and support the child's actions involved in the engagement of different occupations (Case-Smith, 2001). Different environments have inherent features that can enable or disable a child's performance. As described in the literature review in Chapter Two, children with ADHD typically have different symptoms at different times and in different situations. Some children with ADHD may exhibit considerably better self-control, appropriate behaviour, and improved performance with a teacher who maintains a relatively calm atmosphere, is structured, defines his or her expectations for students, and provides a great deal of positive reinforcement.

Also, it was found that schools in which relatively effective programmes are in place are also strong on organisation and environmental factors which include positive attitudes and understanding of ADHD, support at authority level, and provision of coordinated intervention through teams of professional workers (Burcham et al, 1993). Therefore, it is important to assess different environmental factors that may contribute to the presentation of different behavioural patterns in children with ADHD. The assessment provides a basis for effective intervention by addressing those environmental factors that induce or exaggerate the behavioural patterns of a child with ADHD.

The Task Demands

Tasks are defined as “sequences of actions in which persons engaged to satisfy either external societal requirements or internal motives” (Kielhofner, 1995, p.101). Occupational therapists classify these tasks into different occupations in self-care, school/work, play and leisure, and social participation (Watson and Llorens, 1997). Tasks are specific to occupations at particular ages in specific environments (Case-Smith, 2001). When considering the dimension of task demands, variables such as the goal, novelty, appropriateness, level of challenge and importance of the task and also motivation of the child are salient. The goal of a task is the central key factor. It is critical to identify what the child wants or needs to do when planning interventions. The level of novelty, the appropriateness and the challenge within a situation contribute to the overall task performance. Information generated from the literature review indicated that an increase in active participation, the use of verbal as opposed to written response, focus on the novelty of tasks and self-pacing, and also a reduction in the amount of “seat work” required will help to maximise positive outcomes (Zentall, 1993). All this supports the need to assess the child’s sensory-perceptual-motor functions, psychosocial skills and other school/home factors which may contribute to the child’s presenting problems. It also provides the basis for different management strategies.

Family Support and Parental Involvement

As participation in family life and sharing activities with significant others are crucial developmental mechanisms for the child as an occupational being, it is important to consider the impact of family support and parental involvement on the child’s behaviours (Humphry, 2002). This particular dimension could be included under the dimension of environment. However, because of its importance to the management and development of children with ADHD, it has been kept as a separate dimension. Recent research has demonstrated that the more parents hold informed beliefs about ADHD, the less likely they are to use ineffective discipline (Johnston and Freeman, 2002). This highlights the importance of appropriate education or information sharing with parents so that they can interact and support the child in an appropriate manner. As discussed in the literature review, interventions for children with ADHD that aim only at the child’s behaviour are

not effective in bringing about a long-term positive outcome (Harrison and Sofronoff, 2002). Therefore, it is important to understand the content and style of parenting skills in order to alleviate or prevent the possible psychosocial difficulties which affect the child's participation in different occupations. This orientation of intervention is consistent with the findings made by Hinojosa et al (2002) that working with parents through a family-centred care approach has the greatest impact on the progress of a child with disabilities.

Child-Environment-Task Balance Leads to Successful Participation in different Occupations

Child-Environment-Task Balance determines the success of functional performance and participation in different occupations. Functional performance is a process of interacting with the environment according to the child's goals or intentions. It involves an ongoing instant adjustment of those underlying processes (i.e. neurological, psychological and behavioural) required to perform a task within a given space and time. It refers to the match between skills and abilities of the child; the demands of the task; and the characteristics of the physical, social, and cultural environments (Law et al, 1996). Although the relative importance of each dimension to the child's performance shifts, the child's performance difficulties can only be understood by analysing the interaction of the environment, the task and the child (Case-Smith, 2001). For example, if a child with ADHD is asked to engage in a task which over-challenges his or her attention control, this will contribute to an unsuccessful functional outcome. Or if the environments are highly distractible, it will be difficult for the child to sustain the attention control to complete the task even though the task is at the appropriate level for the child.

Occupational therapy intervention can focus on facilitating changes in any of these three dimensions to improve the child's functional performance within a family-centred care approach. These factors are inseparable if occupational therapists are to be successful in discovering the nature of the child's performance challenges and setting an effective course of action to improve functional performance. The goal is to attain a goodness-of-fit between all the three factors, namely the child, the environment and the task in order to enhance the child's participation in different occupations (Law et al, 1996).

CLINICAL APPLICATION OF THE OCCUPATIONAL THERAPY DELINEATION MODEL OF PRACTICE FOR CHILDREN WITH ADHD

Guidelines for Practice

In traditional paediatric occupational therapy practice, therapist focuses on assessing the level of discrete component abilities (e.g. sensory, perceptual and motor functions) which may be affected in a child with an identified condition. The potential functional impact of these component deficits is often inferred. The actual functional ability of the child is not often assessed directly or in great detail. As a consequence, the link between deficits in basic abilities and the functional problems the child experiences in daily life may never become clear. This in turn, may raise doubts about the meaningfulness of and reasons for intervention (Coster, 1998).

In this model, the areas of practice have shifted to a broader perspective for assessment and treatment. The following guidelines outline important concepts to be considered when applying the model to clinical practice:-

1. The model highlights that the child's problems in participation in different occupations are affected by multiple factors. They include the demands of the task, the context of the environment, the child's interaction with parents and teacher, the component abilities of the child at neurological, psychological and behavioural levels, and his/her emotional status and personal goals. It is more congruent with the profession's focus on occupation.
2. The model offers not a structured formula but rather a framework to understand the dynamic forces which affect the child's participation in different occupations, and also provides information on specific assessment and treatment procedures which could be applied to meet individual child's needs.
3. The model emphasises a family-centred approach in service delivery in which the family members' concerns are the starting point for defining needs and priorities. It focuses on enabling and empowering parents in understanding the child's needs and also applying appropriate management strategies in helping

the child to participate in different occupations. It recognises the importance of participation in family life and sharing activities with significant others which are crucial developmental mechanisms for the child as an occupational being.

4. The model advocates the use of a multi-dimensional evaluation framework to confirm or refute the diagnosis of ADHD. It also highlights the importance of making a differential diagnosis and identifying comorbidity.
5. In order to address the multiple problems presented by children with ADHD, a multi-faceted intervention model is used. The environment, task and the child can be structured to promote purposefulness, so that the child attends to and actively participates in purposeful occupations in the environment without distress and sense of failure.
6. Therapists must consider the child's unique traits (both strengths and limitations) and have realistic expectations of treatment outcomes given the child's condition and level of abilities, in order to build their occupational capacities.
7. Home-based intervention programme should be grounded in the typical family occupations with therapeutic activities embedding in the child's regular routines.
8. The model also focuses on intervention in another natural environment where the child involves in other occupations, e.g. educational, play and social activities at school.
9. School-based intervention programme should be integrated into different classroom activities so that the child can participate successfully in different educational and social occupations.

Goal of Intervention based on the Model

Currently, most paediatric occupational therapy practice focuses on the parents' and teacher's priorities rather than on the child's priorities (Humphry, 2002). In this model, the priorities of all three parties (child, parents, and teacher) are considered in order to provide the best possible intervention. The ultimate goal of any combinations of treatment strategies based on the multi-faceted intervention model will focus on improving the child's functional performance in different tasks and also successful participation in different occupations appropriate to the child's

level of development and environmental demands. Different management strategies and remedial treatment techniques will be used to facilitate the changes. The positive outcomes in empowering and enabling parents and teachers are an important contribution to the ultimate goal stated.

Family-Centred Care Approach

Occupational therapists recognise that the ultimate outcome of a child's development is highly influenced by the caregiving environment (Hinojosa et al, 2002). They strive for a collaborative relationship with parents and appreciate that the child with ADHD is part of an interactive family system. Occupational therapists working with children and young people with special needs are part of the formal social support system and are in a position to encourage the family's efforts to network among friends, family members, and parent groups. A family-centred approach is demonstrated when the therapist enables the parent to become an equal team member (Brown et al, 1997). When applying these principles to the management of children with ADHD, all the assessment and treatment procedures adopted should be framed within a family-centred care approach. For details of theoretical constructs of family-centred approach, please refer to Chapter Two on Literature Review.

Specific Assessment and Treatment Procedures

Because of the complexity of the condition, a multi-dimensional evaluation and multi-faceted intervention framework is adopted in the clinical application of the model. Different assessment and treatment procedures from different application models (e.g. behavioural approach, sensory integrative approach, and psychoeducational approach) are integrated into this delineation model for children with ADHD. The following sections describe the range of assessment and treatment procedures and their application within the whole model.

MULTI-DIMENSIONAL EVALUATION OF CHILDREN WITH ADHD

Each child with ADHD has a unique constellation of problems and multiple domains of functioning may be affected (Whalen and Henker, 1996). Therefore, it is important to adopt a multi-dimensional assessment approach in order to

determine whether or not ADHD is present and how it affects the child's development and performance in different areas of occupations. For example, we need assessment tools to evaluate the primary behavioural features pertaining to ADHD and also tools to identify different neurological and psychological correlates for the presenting behavioural patterns. The review of different literature concluded that over half of children with ADHD are influenced by one or more of the associated comorbidities that cause additional psychiatric, neurological and learning problems. Occupational therapists are skilful in the identification of different developmental disorders that are commonly comorbid with ADHD (e.g. DCD, SLD and PDD). Therefore, occupational therapy evaluation should be an essential component in the processes of differential diagnosis and the identification of comorbidity in children with ADHD.

Typically, a behavioural assessment approach is employed in the evaluation of ADHD by using multiple methods of data collection from different individuals and settings (Barkley, 1998a; Anastropoulos & Shelton, 2001). In particular, emphasis is placed upon obtaining reliable information regarding a child's behaviour from parents and teachers as well as from firsthand observation of the child's performance. Therefore, the major components of the multi-dimensional evaluation include rating scales and questionnaires completed by parents and teachers, interviews with them, and observation of the child's behaviour across multiple settings and under varied task conditions (DuPaul & Stoner, 2003). The assessment of the child's sensory processing function, perceptual-motor and functional skills should also be included in order to examine the impact of ADHD on the child's participation in different occupations.

In the research on Consensus Development reported in Chapter Five, the participants agreed the top six priorities of assessment that should be carried out by occupational therapists. The top six priorities of assessment are 1) Perceptual-Motor & Functional Skills (98.6%), 2) Neurological Basis of ADHD (97.2%), 3) School Factors (94.4%), 4) Psychosocial Skills (73.6%), 5) Behavioural Patterns of ADHD (66.7%), and 6) Psychological Basis of ADHD (55.6%). Each area of assessment (see **Table 6.1**) has a direct measurement in one or more of the factors

Table 6.1: Factors Measured by the Top Six Priorities of Assessment

Top Six Priorities of Assessment		Mainly Related to				Examples of Assessment Tools / Procedures / Methods could be used by paediatric occupational therapists
		C	E	T	P	
1.	Perceptual-Motor & Functional Skills (98.6%)	✓		✓	✓	<ul style="list-style-type: none"> • Various perceptual and motor tests used by paediatric occupational therapists e.g. Motor Free Visual Perception Test (Colarusso & Hammill, 1995), Developmental Test of Visual-Motor Integration (Beery and Butkenica, 1997), Movement Assessment Battery for Children (Henderson & Sugden, 1992), DCD Questionnaire for Parents (Wilson, Kaplan, Crawford, Campbell and Dewey, 2000). • Perceived Efficacy and Goal Setting System (PEGS) (Missiuna, Pollock and Law, 2004). • School Function Assessment (SFA) (Coster, Deeney, Halthiwanger and Haley, 1998). • School Version of the Assessment of Motor and Process Skills (School AMPS) (Fisher and Bryze, 1998). • Nonstandardised questionnaires or checklists on functional skills.
2.	Neurological Basis of ADHD (97.2%)	✓				<ul style="list-style-type: none"> • Sensory Profile (Dunn, 1999). • Classroom and clinic observation on sensory-based behaviours.
3.	School Factors (94.4%)	✓	✓	✓	✓	<ul style="list-style-type: none"> • School Function Assessment (SFA) (Coster et al, 1998). • The Strength and Limitation Inventory: School Version (Dowdy et al, 1998). • Classroom Observation on teaching style, classroom organisation, schedule of lessons etc. • Interview teacher to gather information on the child's behaviour and performance.
4.	Psychosocial Skills (73.6%)	✓	✓	✓	✓	<ul style="list-style-type: none"> • Classroom Observation on the child's behaviour, social skills, peer-group relationship etc • Observation during clinic assessment e.g. child's behaviour, emotional control, interaction with parents. • Interview teacher and parents to gather information on the child's behaviour, emotional control etc. • The Strength and Limitation Inventory: School Version (Dowdy et al, 1998). • Information from other professionals e.g. psychologists.
5.	Behavioural Patterns of ADHD (66.7%).	✓	✓	✓	✓	<ul style="list-style-type: none"> • ADHD Rating Scale-IV – Home and School Versions (DuPaul et al, 1998). • Observational assessment and interviews with parents, teacher, and the child.
6.	Psychological Basis of ADHD (55.6%).	✓				<ul style="list-style-type: none"> • Continuous Performance Test – II (Conners, 2001). • Auditory Continuous Performance Test (Keith, 1994). • Behaviour Rating Inventory of Executive Function (Gioia et al, 2000).

Key: C = Child E = Environment T = Tasks P = Participation in different Occupations

(i.e. the child, environment, task and participation in different occupations) within the delineation model described. There are also many different assessment tools, procedures and methods which could be used for each area. A multi-dimensional evaluation protocol could be developed to incorporate these six areas of assessment as well as relevant assessment procedures pertaining to the problems of children with ADHD.

The following sections discuss the range of tools, procedures and methods available for each area of assessment, and also the factors that are being measured (i.e. the child, environment, task and participation in different occupations).

Assessing Perceptual-Motor & Functional Skills

The assessment of perceptual-motor and functional skills is a common domain of concern in traditional paediatric occupational therapy practice. Assessment in this area provides information on the underlying functions / dysfunctions of the child, their impact on the child's ability to carry out different tasks and engage in different occupations. Information generated in this area of assessment helps to make differential diagnosis and identify comorbidity e.g. DCD. Detailed information on the child's functional difficulties will form the basis for different intervention strategies. Therapists can administer a battery of standardised tests within the routine paediatric occupational therapy practice e.g. assessment of different perceptual and motor functions, functional performance such as self-care skills, handwriting skills, leisure and play skills. The following constitute a brief review of some of the standardised tools.

1. **The Motor Free Visual Perception Test – Revised (MVPT-R)** (Colarusso and Hammill, 1995) is designed to measure a child's ability to interpret and analyse visual information without the need for motor output. It is for children aged 4 to 10 years old. There are a total of 40 test plates. A child just needs to point to or say the answer when working on different test plates. The test measures the child's ability in visual discrimination, figure-ground, visual memory, visual closure and spatial relationships. It provides an overall Perceptual Quotient and Perceptual Age.

2. The **Beery-Buktenica Developmental Test of Visual-Motor Integration (VMI)** (Beery and Buktenica, 1997) is designed to measure a child's ability to transfer visual information to motor output. The child needs to visually analyse different geometric patterns and copy it down on the test booklet. There are two forms. The short form has 18 items and is for children aged 3 to 7 years old. The long form has 27 items and is for children aged 3 to 18 years old. It provides standard scores, scaled scores, percentiles and motor ages.
3. The **Movement Assessment Battery for Children (Movement ABC)** (Henderson & Sugden, 1992) is designed to measure a child's movement skills which are essential for the child's participation in different educational and social activities. It covers three primary performance areas of manual dexterity, ball skills and balance for children aged 4 to 12 years old. It provides scaled scores and percentiles. In addition, qualitative observations are made about the child's movement performance, behaviour, and any physical defects or difficulties.
4. The **DCD Questionnaire** (Wilson et al, 2000) is designed to measure coordination in children. There are 17 items in the questionnaire which are grouped into four areas of motor functions: 1) Control during movement, 2) Fine motor / handwriting, 3) Gross motor / planning, and 4) General coordination. Three ranges of score have been devised to indicate whether or not the child has any problems, suspected coordination problems or presence of coordination problems. Research on the validity of the questionnaire indicated that it can correctly classify 86% of children with DCD and 71% of children with DCD (Wilson et al, 2000).
5. The **Perceived Efficacy and Goal Setting System (PEGS)** (Missiuna, Pollock and Law, 2004) is a standardised tool which enables young children, aged between 6 to 9 years old, to self-report how they perceived their level of competency in different functional activities by using picture cards. It is useful for setting goals for intervention programmes. There are also two

forms to be used with parents and teacher. They provide information on their perceptions of the child's functional performance in self-care tasks, school tasks, and leisure activities.

6. **The School Function Assessment (SFA)** (Coster et al, 1998) is designed to measure a child's performance of functional tasks which enable him or her to participate in the academic and social aspects of a school curriculum. The rating form has 26 scales; each scale is scored using a 4- or 6-level rating, depending on the item. The assessment is completed by a team under the supervision of a coordinator, or by the team collaboratively completing the form together.
7. **School Version of the Assessment of Motor and Process Skills (School AMPS)** (Fisher and Bryze, 1998) focuses on functional school-related skills in the classroom. Motor and process elements of schoolwork performance are evaluated through observation in the classroom setting.

Some therapists do use non-standardised questionnaires or checklists to gather information in this area of assessment because most of these standardised tools are either too expensive, take a long time to administer, are not readily available in certain work settings, or are not standardised for the UK population.

Assessing the Neurological Basis of ADHD

As discussed in Chapter Two on literature review, poor sensory modulation function could be a basis for the presenting behavioural pattern in children with ADHD (Cermak, 1988a, and Mangeot et al, 2001). Sensory modulation is the brain's capacity to regulate and organise the degree, intensity, and nature of responses to sensory input in a graded and adaptive manner, so that an optimal range of performance and adaptation to challenges from the environment can be maintained (Lane, Miller and Hanft, 2000). Children with ADHD tend to present a pattern of sensory seeking behaviour that interferes with their regulation of behaviour and also participation in different occupations (Dunn and Bennett,

2002). Therefore, it is important to evaluate the child's sensory processing functions. In this area of assessment, the focus will be on the child's sensory modulation functions.

The **Sensory Profile** (Dunn, 1999) is a judgement-based caregiver questionnaire. It provides a standard method to measure a child's sensory processing abilities and to profile the effect of sensory processing on functional performance in the daily life of a child. The profile is most appropriate for children 5 – 10 years of age. It consists of 125 items grouped into 14 sections. Each item describes a child's responses to various sensory experiences. In the Summary Score Sheet of the Sensory Profile, the items are categorised into 9 factors and 3 main sections.

A separate worksheet is developed to analyse the visual / tactile processing cluster which consists of 12 items related to children with ADHD. Within this worksheet, three other factors which typically scored low in children with ADHD are included. These three factors are: 1) Factor 1 (Sensory Seeking), 2) Factor 2 (Emotionally Reactive), and 3) Factor 5 (Inattention / Distractibility). This ADHD worksheet can be used as part of a multi-dimensional evaluation protocol for diagnosing ADHD, and can be used to validate parents' and teachers' referral concerns.

Assessing School Factors

School is another environment in which children with ADHD experience many challenges. Their successful engagement in different educational and social activities can be affected by many different factors related to the child, the environment and the demands of tasks. Therapists can use the School Function Assessment to gather information from the teacher. Another useful tool specifically designed for a child with ADHD is the Strengths and Limitations Inventory: School Version (SLI) (Dowdy et al, 1998). The SLI is a multidimensional rating scale that contains items similar to those used to describe ADHD in DSM-IV. It is designed to document strengths and limitations that may be manifested in an academic setting. It consists of items that address memory, reasoning, executive function, social/emotional status, communication, reading,

writing and mathematics. The teacher or anyone who has observed the child over time can complete it. Accompanying the SLI is a Guide to Classroom Interventions which provides examples of intervention strategies for specific problems identified in the SLI.

Another important means of assessment in this area is classroom observation. Therapists can observe children across a variety of settings (e.g. classroom, playground and dining hall) and with different individuals. In many cases, direct observations will provide the most fruitful data when conducted during independent seatwork situations and transitions between lessons (Dowdy et al, 1998). Platzman, Stoy, Brown, Coles, Smith, & Falek (1992) recommended to count the frequency of the following three categories of behaviour: 1) off-task behaviour, 2) excessive gross motor activity, and 3) negative vocalisations e.g. refusal to obey commands. They found that these three behaviours consistently discriminate between children with and without ADHD.

It is also helpful to observe the behaviour of the teacher and other children in the class. For instance, teacher behaviours (e.g. prompts, reprimands, feedback, shouting) could be possible antecedent and/or consequent events for the child's behaviour (DuPaul and Stoner, 2003). Therapists can use the SLI and the ADHD Rating Scale – School Version (DuPaul et al, 1998) to structure their observations within the school environment. In addition to classroom observation, therapists can also interview teachers to gather more information. This will be discussed in more detail in the next section.

Assessing Psychosocial Skills

Psychosocial functions encompass a wide range of skills e.g. the child's emotional control, peer-group relationships, social skills, and interaction with parents. Some of these skills are intrinsic to the child's level of emotional development and maturity, and some are related to the demands of the environment and the tasks. Problems in these psychosocial skills will affect the child's social adjustment and participation in different occupations. No specific standardised tools have been

developed for children with ADHD in this area of assessment. Therapists can use the SLI, observation and also interview parents and teacher to gather relevant information.

Systematically conducted, semi-structured interviews are an important component of the assessment of ADHD. Interviews can be carried out with parents, teacher and the child involved. The interviews provide the phenomenological data that rating scales cannot capture (Barkley & Edwards, 1998). During the interviews, the therapist in a sense becomes another instrument in the assessment process. A form is devised to guide therapists to conduct the interviews with parents, teachers and the child (see **Appendix D**). It is based on the work of different authors in the field (Guevremont, DuPaul and Barkley, 1990; Wodrich, 1994; Barkley, 1998a; Barkley & Murphy, 1998; Dowdy, et al, 1998; DuPaul & Stoner, 2003).

The interviews conducted help to determine the presence or absence of various ADHD symptoms as well as to identify historical and/or current factors possibly serving to maintain identified problem behaviours. Although important information can be obtained through interviews, extreme caution is recommended in using the results of the interviews to validate or invalidate the existence of ADHD. It is important to see the interview data as one source of information to be considered in combination with other sources. Information from other professionals (e.g. child psychiatrist, family therapist) will be useful for the overall interpretation of the child's presenting problems.

Assessing Behavioural Patterns of ADHD

It is important to note that there are many reasons for children to present with problems in attention control and behavioural regulation. Therefore, therapists need to relate the presenting ADHD features to any identifiable neurological and psychological dysfunctions, as discussed in the theoretical concepts of the model. It is also important to check whether the ranges of inattentive, hyperactive and impulsive behaviours presented by the child were present before age 7 years, occur in two or more settings and also cause impairment in social, academic, or occupational functioning (DSM-IV, APA, 1994).

The ADHD Rating Scale – IV (DuPaul et al, 1998) is useful for screening, assessment, and the evaluation of treatment outcome (see **Appendix E**). There are two versions – Home and School Versions. Each version has 18 items, which reflect the DSM-IV criteria as closely as possible while maintaining brevity. Both versions are completed independently by a child’s parent and teacher. The combination of parent and teacher ratings was found to predict diagnosis of ADHD in the context of both clinic-based and school-based assessments.

It is important to note that interview and rating scale data are subject to a number of limitations, including the inherent biases of those answering the interview questions and completing the questionnaires (Barkley, 1998a). Thus, these data should be supplemented with observational assessment of the child’s behaviour. The value of observation data is well documented. The data are obtained from observations in the natural environment. They are generally more objective than those obtained through interviews and rating scales (Schaughency & Rothlind, 1991). However, the ADHD Rating Scale-IV is useful to quantify the level of severity of the child’s behaviours.. When used as part of a multi-dimensional evaluation protocol, the ADHD Rating Scale-IV can provide reliable and valid data regarding the frequency of ADHD symptoms (DuPaul et al, 1998).

Assessing Psychological Basis of ADHD

The assessment of psychological functions is typically the role of psychologists. Therapists can obtain information from psychologists if they have assessed the child. In assessing the psychological basis of ADHD, there is a wide range of standardised tests which can be used (see Table 2.3 in Chapter Two). Some are specifically developed for children with ADHD e.g. the Continuous Performance Test-II (Connors, 2001), the Gordon Diagnostic System (Gordon et al, 1996).

In clinical practice, the Behaviour Rating Inventory of Executive Function (BRIEF) (Gioia et al, 2000) is found to be useful in identifying executive dysfunctions in children with ADHD and providing a basis for intervention. The BRIEF is a questionnaire for parents and teachers that enables professionals to assess executive function behaviours in the home and school environment. It is

designed for children aged 5 to 18 years old with different disability conditions, including ADHD. It measures eight different aspects of executive functioning: inhibit, shift, emotional control, initiate, working memory, plan/organise, organisation of materials, and monitor. All these aspects of executive functions have strong implications in the behavioural patterns of ADHD (Barkley, 1997).

Figure 6.2 illustrates the application of some of these assessment techniques within the delineation model for children with ADHD. Although each of these techniques for different areas of assessment is limited in some manner, when used in a multi-dimensional evaluation package a system of “checks and balance” develops such that the drawbacks of any single measure are balanced by data obtained through other means (Barkley, 1998; Anastropoulos & Shelton, 2001).

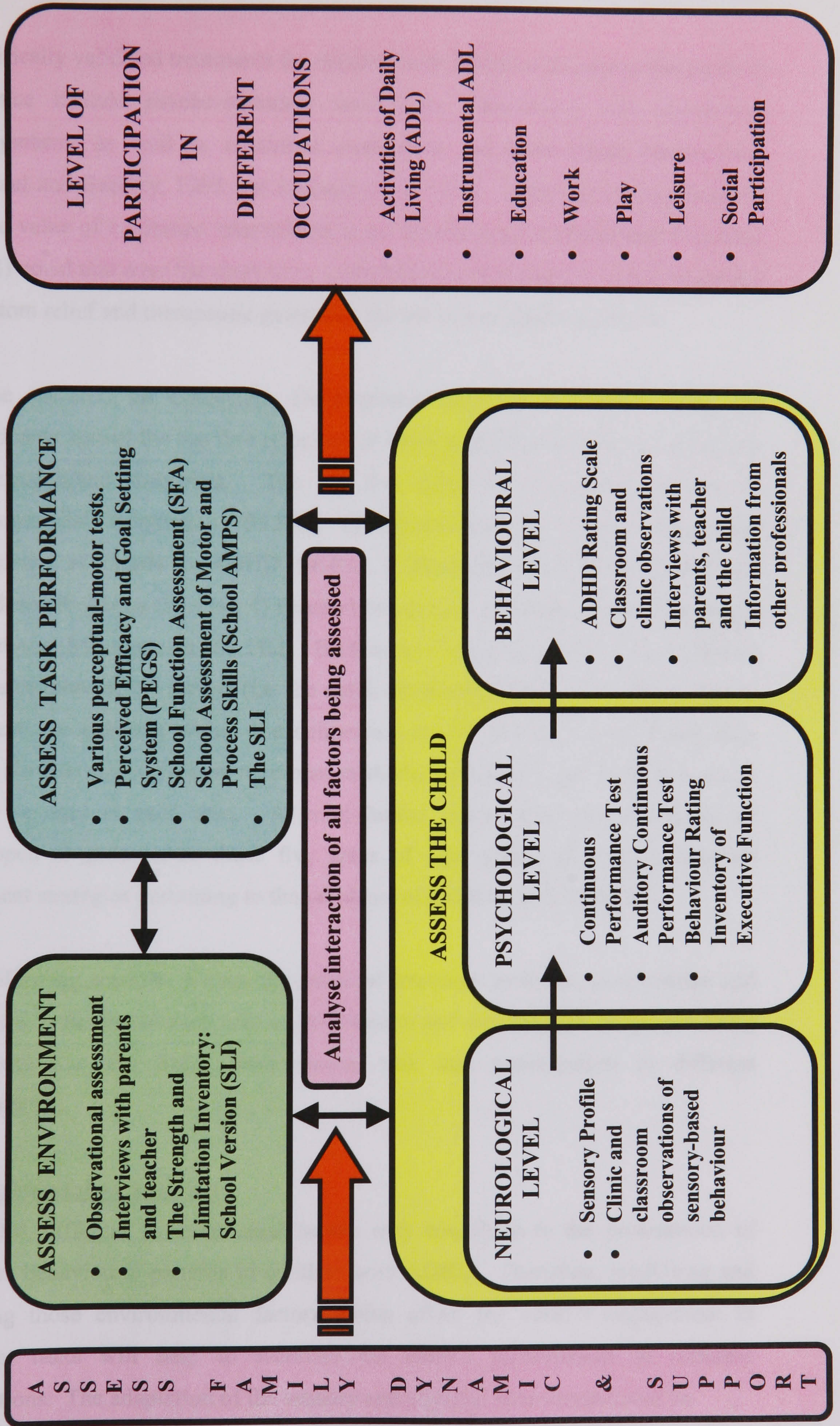
The overriding goals of the multi-dimensional evaluation are to derive accurate data regarding the frequency and severity of ADHD behaviours across settings and with different individuals, as well as the possible causes of the child’s difficulties in performing and participating in different occupations. The results provide relevant information for the selection of different treatment components within the multi-faceted intervention model.

MULTI-FACETED INTERVENTION OF CHILDREN WITH ADHD

Although much is known about certain benefits of medications and behavioural approaches (Jensen, 1999 and MTA Cooperative Group, 1999), much less is known about the optimal strategies for tailoring these treatments according to timing, dose, and combination for individual children with ADHD (Conners, 2000). It is undoubtedly clear that a diagnosis of ADHD should not constitute a recommendation of automatic drug treatment. As stated by Taylor and Hemsley (1995) medication must not become the first line of treatment.

In order to remediate the “roots” of the disorder; a model of multi-faceted intervention was advocated in Chapter Two. It is important to note that no treatment has yet been proved to cure the condition of ADHD, or to produce any enduring effects in these children once the treatment is withdrawn. So far, the only

Figure 6.2: Application of the Model in the Multi-dimensional Evaluation of Children with Attention Deficit Hyperactivity Disorder (ADHD)



empirically validated treatments for children with ADHD with substantial research evidence include psycho-stimulant medication, behavioural and educational management, as well as combined medication and behavioural management (DuPaul and Barkley, 1993 and Richters et al, 1999). Although current research on the value of combined intervention is not conclusive, Goldstein and Goldstein (1998) noted that over the short term, a combination of treatments provides greater symptom relief and therapeutic gains than the use of any single approach.

In the research on Consensus Development reported in Chapter Five, the participants agreed the top five priorities of intervention that should be carried out by occupational therapists. The top five priorities of intervention are 1) Environmental Adaptation (95.8%), 2) Remediation of Sensory Integrative dysfunction as a basis for ADHD (94.4%), 3) Remediation of Developmental and Functional Problems (93.1%), 4) Parental Education and Training (81.9 %), and 5) Educational Management (61.1%). Each area of intervention has a direct impact on one or more of the factors (i.e. the child, environment, task and participation in different occupations) within the delineation model described (see **Table 6.2**). There are also many different treatment methods, programmes and strategies which could be used in each area. A multi-faceted intervention protocol could be developed to incorporate these five areas of intervention as well as relevant treatment strategies pertaining to the problems of children with ADHD.

The following sections discuss the range of treatment methods, programmes and strategies available for each area of intervention and also the factors that are being addressed (i.e. the child, environment, task and participation in different occupations).

Environmental Adaptation

As stated, different environmental factors may contribute to the presentation of different behavioural patterns in children with ADHD. Therefore, modifying and adapting those environmental factors which affect the child's engagement in different tasks will help to facilitate the child's participation in different occupations. The adaptation of the sensory and physical environment will be

Table 6.2: Factors Addressed by the Top Five Priorities of Intervention

Top Five Priorities of Intervention	Mainly Related to				Examples of Treatment Methods / Programmes / Strategies could be used by paediatric occupational therapists
	C	E	T	P	
1. Environmental Adaptation (95.8%).	✓	✓	✓	✓	<ul style="list-style-type: none"> Adaptation of home/classroom environment and routine e.g. consider the sensory characteristics of the environment, organisational features, use predictive schedule (Barkley, 1998a; Dowdy et al, 1998 and Nackley, 2001). Integrate different sensory calming and alerting techniques in family/classroom schedule i.e. sensory diet (Wilbarger, 1995).
2. Remediation of Sensory Integrative Dysfunction as a basis for ADHD (94.4%).	✓	✓		✓	<ul style="list-style-type: none"> Sensory integrative therapy (Ayres, 1972 & 1979). Sensory diet concept and programme (Wilbarger, 1995). The Alert Programme (Williams & Shellenberger, 1992 & 1994). Therapeutic Listening Programme (Frick & Hacker, 2000). MORE: Integrating the mouth with sensory and postural function (Oetter et al, 1995).
3. Remediation of Developmental and Functional Problems (93.1%).	✓		✓	✓	<ul style="list-style-type: none"> Sensorimotor and Perceptual-motor programmes (Scheerer, 1997). Visual perceptual training (Frostig & Horne, 1973). Fine motor skill training (Levine, 1991). Handwriting skills training (Olsen, 1980 and Benbow, 1990). Self-care skills training (Klein, 1983 and Christiansen, 1994).
4. Parental Education and Training (81.9 %).	✓	✓	✓	✓	<ul style="list-style-type: none"> Feedback to parents and teachers on the results of the assessment in order to promote their understanding of the child's underlying dysfunction and presenting problems. Provide ADHD Information Packs to parents and teacher (Jones, Searight and Urban, 1999; CHADD, 2000). Educate parents and teachers on different behavioural management strategies (Barkley, 1992, 1994, 1995 & 1998a).
5. Educational Management (61.1%).	✓	✓	✓	✓	<ul style="list-style-type: none"> Guide to classroom intervention for the Strengths and Limitation Inventory (Dowdy et al, 1998). The application of different behavioural and sensory techniques into classroom routine e.g. token economy, visual timetables, sensory diet.

Key: C = Child E = Environment T = Tasks P = Participation in different Occupations

discussed here as it is considered to be an important area of intervention in paediatric occupational therapy practice (McEwen, 1990).

Knowledge of the child's sensory profile helps adults modify the external environment to best support interaction and self-regulation. Over-aroused children need calm settings with minimal distractions and controlled sensory "flow", whereas under-aroused children generally do better in a rich sensory environment that provides many opportunities for active sensory-based exploration (Williamson & Anzalone, 2001). Thus, the same environment may have quite opposite effects on children with different sensory profiles. Clinical experience indicates that for children with ADHD, a calming environment with less stimulation is desirable to maintain their attention control and promote self-regulation, e.g. a classroom with a clear layout and neutral colour scheme.

The therapist needs to help parents and teacher appreciate the extent to which naturally occurring activities and interactions within the environment provide the sensory input required to regulate or disrupt regulation of arousal level, attention control and activity level. Intervention does not always call for provision of additional sensory input. Indeed, decreasing the sensory stimulation that the child is receiving from the environment is often the required strategy (Williamson and Anzalone, 2001).

It is important to note that reasonably consistent, predictable, and structured daily routines help children self-regulate. Parents and teacher should anticipate a child's sensory needs. They should not wait until a child is sluggish to introduce an arousing activity, or wait until a child is overloaded to do something calming. The therapist should introduce the use of a "Visual Timetable" within home and classroom environments. Visual timetable is a visual presentation of a daily schedule on a large piece of paper or wall chart (Dowdy et al, 1998). It provides a predictive schedule and helps the child to know what is about to happen and make adjustments for the upcoming sensory changes and other demands, e.g. stay seated to complete a handwriting task and then transit to playground for break time.

Being able to anticipate events enables the child to move from a reactive mode to a purposeful, self-initiated mode of behaviour, which, in turn, helps the child cope more successfully with changes.

Remediation of Sensory Integrative Dysfunction as a basis for ADHD

As discussed, recent research studies have provided evidence of the association between dysfunction in sensory modulation and ADHD (Mangeot et al, 2001 and Dunn and Bennett, 2002). Poor Sensory Modulation has a strong impact on a child's behaviour in the areas of arousal, attention, affect and action (Williamson & Anzalone, 2001; Schaaf & Anzalone, 2001). Sensory integrative techniques may be effective in addressing many of the problem behaviours characteristic of children with ADHD, including inattention, disorganisation and hyperactivity (Bhatara, Clark and Arnold, 1978; Kantner & Tacco, 1980; Bhatara, Clark, Arnold, Gunsett and Smeltzer, 1981).

Providing intervention based on the principles of Sensory Integration Theory is both a complex and an exciting process. It requires that the therapist be able to combine a working knowledge of Sensory Integration Theory with an intuitive ability to engender a child's trust and create the just right challenge. Sensory integrative intervention aims to encourage goodness-of-fit (or just-right challenge) between the child's sensory needs and the sensory-related demands that the physical and social environment place on the child (Williamson & Anzalone, 2001). The ultimate goal of intervention is to facilitate a child's development, self-actualisation, and occupational performance (Bundy et al, 2002).

In order to assess the child's sensory needs, the therapist needs to consider how the child's sensory diet varies throughout the day (Williams & Shellenberger, 1994). The concept of "sensory diet" is based on the idea that each individual requires a certain amount of sensory stimulation to be their most alert, adaptable and skillful (Wilbarger and Wilbarger, 1991 and Wilbarger, 1995). This is much like a person's nutritional requirement. The important thing about a "sensory diet" is to help the child feel calm, alert, and organised most of the time by using special sensory activities scheduled throughout the day. Activities are much more

effective when the child not only selects them out of interest and need, but also completely directs them himself/herself. Goal-directed and meaningful activities are more powerful in promoting self-regulation (Wilbarger, 1995). For example, for a child with sensory seeking behaviour, teacher can assign the child to distribute learning materials so that the child can get the necessary movement stimulation.

For therapists who have completed post-graduate training in certain specific sensory-based techniques, the *Therapeutic Listening Programme* ((Frick & Hacker, 2000) and the *MORE: Integrating the Mouth with Sensory and Postural Function* (Oetter, Richter and Frick, 1995) could provide effective techniques in regulating the child's behaviour. There are also different sensory modulation techniques which have been proved to be useful in regulating a child's behaviour and attention control. These include 1) giving the child deep pressure touch (Krauss, 1987), 2) using latex-free rubber tubing as "chewy" (Scheerer, 1992), 3) using a weighted vest (VandenBerg, 2001), and 4) allowing the child sit on a therapy ball chair while doing his or her schoolwork (Schilling, Washington, Billingsley and Deitz, 2003). Besides using these sensory modulation techniques, the therapist should integrate the use of a "Visual Timetable" with a Sensory Diet Programme.

Another key concern from the sensory integration perspective is fostering the ability of the parents and teacher to read behavioural cues, to interpret them, and to respond contingently to meet the child's sensory needs. It is important to introduce the concept of 'sensory-based behaviour' in order to promote the understanding of the child's behaviour from the sensory processing perspective (Trott, 2002).

Therapist can use the cognitive strategies described in the programme "*How does your engine run? The Alert Programme for Self-Regulation*" (Williams and Shellenberger, 1992 & 1994) to help the parents and teacher to understand the relationship between sensory modulation dysfunction and behaviour, and to help the child to develop self-regulation (Salls and Bucey, 2003). In the Alert Programme, the authors introduce the use of an engine level to equate it to the

child's arousal level. They suggest different sensory modulation and behavioural regulation techniques to normalise the child's arousal level for better attention control and behavioural organisation.

In summary, sensory integration intervention emphasises the importance of collaborative work with parents and teacher, and the modification of the environment to grade children's sensory experiences. The goal is to attain a goodness-of-fit between the sensory-related demands of the physical and social environments and the child's sensory needs. A well-balanced sensory diet can facilitate the achievement of a good fit (Williamson and Anzalone, 2001).

Remediation of Developmental and Functional Problems

As identified by Barkley (1998c), Whitmont and Clark (1996) and Piek et al (1999), children with ADHD present a range of perceptual, language, motor and functional problems. These problems will have a strong impact on the child's performing in different tasks and affect the child's successful participation in different occupations. The presence of these problems could be part of the ADHD features or because of comorbid conditions e.g. DCD. The therapist should identify the problems and provide intervention accordingly. There are many different treatment methods, programmes and strategies available for the remediation of developmental and functional problems (see Table 6.2). It is important for the therapist to integrate this area of intervention into the multi-faceted intervention programme for a child with ADHD.

Parental Education and Training

From the family-centred care perspective, sharing information about the child's condition with main caregivers is an important aspect of work. Research studies reviewed in Chapter 2 suggested that better treatment outcome could be achieved by improving parents' and teachers' understanding of the condition, and also their knowledge of appropriate management strategies used at home and school (Burcham et al, 1993; Fallone, 1998; Corkum et al, 1999; Hoza et al, 2000 and Johnston and Freeman, 2002). The sharing of information can be achieved by using the information packs, seminars and direct consultation with parents and

teacher. The use of ADHD Information Packs allows parents and teachers to read through the information on the condition in their own time. This also helps them to formulate questions which the child's therapist could address at a later stage.

Previous research studies have found significant results among a wide variety of behavioural interventions, most of which include some form of training parents in behavioural management principles (Barkley, 1989a; Coker & Thyer, 1990; Hinshaw & Melnick, 1992). Behavioural management strategies are an essential part of the multi-faceted intervention programme. Barkley (1992 & 1995) identifies 10 Guiding Principles for raising a child with ADHD (see Table 2.6 in Chapter Two). In applying these principle-centred behavioural strategies, parents need to pause before reacting to the present misconduct of the child, use the delay to reflect on the principles, and choose a response to the child that is consistent with these principles.

Educational Management

ADHD places children at serious educational risk (Barkley, 1994). Children with ADHD pose particular challenges for their teachers. Teachers will need to adapt the learning environment and their teaching style in order to meet their specific needs for better behavioural organisation and successful educational outcomes. Just as the goal at home is to lessen the impact of ADHD and to encourage development of good habits, much the same is true at school. An ideal programme for a student with ADHD is one that prevents his or her attention or self-control problems from hindering learning (Wodrich, 1994).

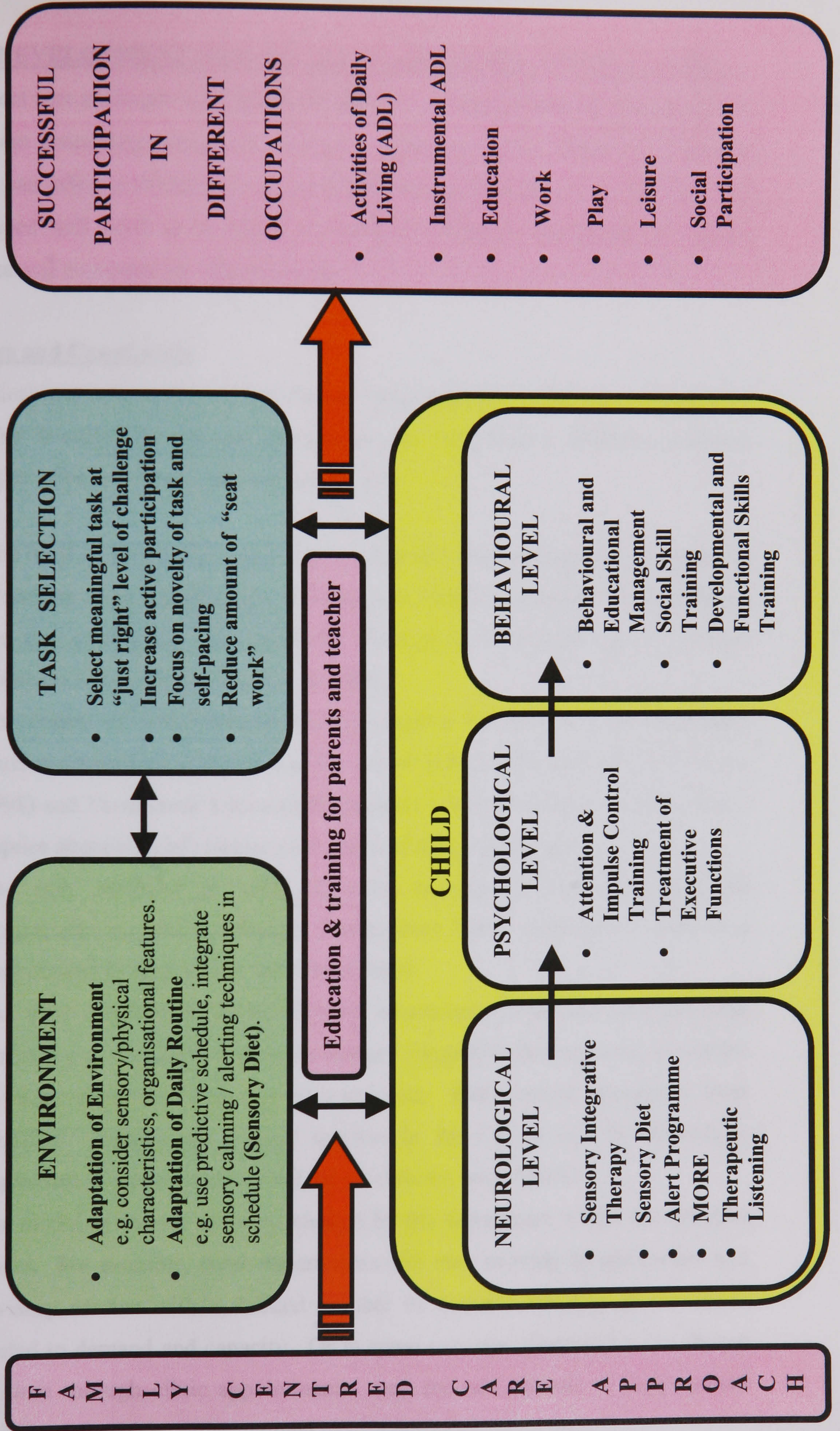
When ADHD symptoms adversely affect academic performance and success, educational accommodations will be necessary (Cohen, 1998). Therapists should apply the principles of behavioural management and sensory modulation in developing a programme of classroom management and environmental adaptation. The programme should be developed in conjunction with the parents, teachers, and possibly with the child. The therapist should recommend the use of the "Visual Timetable" with sensory diet activities integrated into the schedule, and help the teacher to set up basic rules of classroom behaviour for all children. Other

suggestions include changes in the lesson schedule, classroom layout, seating position of the child, use of different behavioural and sensory techniques. The therapist can also use the results of the Strengths and Limitations Inventory (SLI) to identify specific areas for intervention. The Guide to Classroom Interventions accompanying the SLI provides examples of appropriate interventions for specific behaviours identified in the SLI (Dowdy et al, 1998). The therapist should also check other environmental factors in relationship to the child's associated problems e.g. appropriate dimension of chair and table to address poor postural control, selection of seating position to address potential ocular-motor deficits, provision of a special device to aid efficient handwriting performance.

Figure 6.3 illustrates the application of some of these intervention strategies within the delineation model for children with ADHD. Although the treatment strategies discussed and outlined in Table 6.2 are not completely occupation-based, they are facilitatory strategies to enable the child with ADHD to engage in different tasks and participate in different occupations. Paediatric occupational therapists often use play activity as a treatment medium within these facilitatory strategies in order to engage the child in the intervention process. Play activities serve as a means to improve performance, because they are self-motivating, inherently interesting and fun (Parham & Primeau, 1997). Through play activities, children can better self-organise themselves in different occupations.

After the completion of the multi-dimensional evaluation, a feedback session should be conducted with both parents and teachers so that they both hear the same information. It is important to set common goals and objectives with parents, teachers and the child. The goals and objectives should be established close to the beginning of a treatment programme and reflect relevant areas for the documentation of progress. Whenever possible, goals should also reflect the child's strengths i.e. encourage positive behaviour. After setting appropriate and realistic goals and objectives, different training strategies should be selected to develop the multi-faceted intervention programme.

Figure 6.3: Application of the Model in the Multi-faceted Intervention for Children with Attention Deficit Hyperactivity Disorder (ADHD)



THE DEVELOPMENT OF CARE PACKAGES BASED ON THE MODEL

Different care packages could be developed by combining different assessment and treatment procedures described. However, there are many factors or constraints which can affect a therapist's choice of different procedures. Any care packages developed will need to be based on research evidence, field-tested in clinical practice and evaluated by efficacy study.

Factors and Constraints

In clinical practice, there are many factors and constraints which may influence the way the therapist carries out assessment and implements different treatment strategies. The key factors and constraints are:-

1. The level of knowledge and skills in using different assessment and treatment procedures and applying it to children with ADHD as some of the procedures are not specifically developed for children with ADHD e.g. the School Function Assessment (Coster et al, 1998).
2. The degree of post-graduate training required for using certain assessment tools and treatment methods e.g. the use of School AMPS (Fisher and Bryze, 1998) and Therapeutic Listening Programme (Frick and Hacker, 2000). These require attendance of relevant post-graduate training courses.
3. The cost involved in using different assessment tools and treatment programmes e.g. the Continuous Performance Test – II (Conners, 2001) is a very expensive item which costs about £500.
4. The time involved in using different assessment procedures and treatment methods e.g. the classical didactic sensory integrative therapy sessions require intensive direct hands-on treatment sessions. With limited resource in most paediatric occupational therapy services in the UK, it will be difficult to implement this treatment method for all children with ADHD.
5. The model of service delivery adopted by the department where the therapist works. For example, some departments will only provide an assessment and advisory service with a defined number of contacts because of the issues related to demand and capacity. Or in some services, therapists will only see children through clinic appointments; they are not allowed to make school visits because of the time involved.

An Example of a Care Package

Because of the above factors and constraints, the author has developed a care package which is based on the theoretical concepts of the model, different research evidence and the author's clinical experience, and he has also taken into consideration the cost, time, resources and training involved. The care package will require the use of assessment tools which are inexpensive or readily available in most paediatric occupational therapy departments. The assessment tools selected can provide sufficient information to identify the child's underlying dysfunctions and to plan a multi-faceted intervention programme.

The care package consists of a clinical pathway of 12 weekly contacts with a combination of clinic appointment and school visits. The duration of the pathway is affordable as it is consistent with most of the packages of care for different care groups (e.g. children with DCD) provided by paediatric occupational therapy services throughout the countries in the UK. In terms of training requirements, the therapist needs to attend a 3-day training course to learn different assessment and treatment procedures outlined below. This could be part of their continuing professional development identified in their professional development plans.

The processes of assessment and treatment are based on the principles of family-centred care approach described. In the multi-dimensional evaluation process, the therapist uses the DSM-IV ADHD diagnostic criteria and also the following assessment procedures:-

1. For the neurological basis of ADHD, the Sensory Profile (Dunn, 1999) and clinical observation are used.
2. For the behavioural patterns of ADHD, semi-structured interview, observational assessment, and the ADHD Rating Scale – IV Home and School versions (DuPaul et al, 1998) are used.
3. For the school factors, semi-structured interview, classroom observation, and the Strength and Limitation Inventory: School Version (Dowdy et al, 1998) are used.
4. For the child's perceptual-motor and functional skills, the DCD Questionnaire for parents (Wilson et al, 2000) and other perceptual-motor tests are used.

5. For the child's psychosocial skills, interviews with parents and teachers, and observational assessment during clinic appointment and within school environment are used. Information from other professional, e.g. psychologists, will be incorporated into the whole assessment process.

The psychological basis of ADHD is not included as it is usually covered by clinical or educational psychologists unless the occupational therapist has appropriate post-graduate training in the administration and interpretation of different psychological tests outlined in Table 6.1 e.g. the Continuous Performance Test – II (Conners, 2001), the Behaviour Rating Inventory of Executive Function (Gioia et al, 2000). Therapists can obtain information from psychologists if they have assessed the child.

In the multi-faceted intervention programme, the following components are selected:-

1. Education of parents and teachers about ADHD through a feedback session and also the provision of information packs (Jones et al, 1999 and CHADD, 2000). Sharing information about the results of the evaluation helps to promote the understanding of the child's underlying dysfunctions, and their effect on the child's behaviour. The educational process will also be reinforced through subsequent contacts to train parents and teachers to use different behavioural management strategies (Barkley, 1992, 1994, 1995 & 1998a).
2. Use of different sensory modulation concepts and techniques selected from the Alert Programme (Williams & Shellenberger, 1992 & 1994) and the MORE Programme (Oetter et al, 1995), and also the Sensory Diet Programme (Wilbarger, 1995).
3. Adaptation of home/classroom environment and routine by considering the sensory characteristics of the environment (Nackley, 2001), using the predictive visual timetable (Barkley, 1998a & Dowdy et al, 1998), and integrating different sensory modulation techniques into classroom routine i.e. sensory diet (Wilbarger, 1995).

4. For educational management, the therapist can integrate different management strategies described in the Guide to Classroom Intervention for the Strengths and Limitation Inventory (Dowdy et al, 1998). The therapist can also help teachers to apply different behavioural management strategies (e.g. token economy) and sensory modulation techniques to regulate the child's behaviour in order to promote his/her engagement in different educational activities.
5. Remediation of any other developmental and functional difficulties identified by using different treatment strategies or approaches e.g. perceptual-motor skills, handwriting skills, and self-care skills.

Measuring Outcomes of the Care Package

It will be important to plan and institute a system to measure whether or not the care package has truly made an impact on the child's quality of life. Outcomes of the care package can be measured from different perspectives. For example, the change in the child's level of participation in different occupations could be used to evaluate the efficacy of the care package. However, the fact that few standardised tools for children that use an occupation-centred assessment orientation are available limit paediatric practice (Coster, 1998). The few available tools are either too expensive, taking a long time to administer, requiring post-graduate training to learn to use, or not specifically designed for children with ADHD. In this situation, paediatric occupational therapists may need to develop nonstandardised tools and checklists that provide qualitative information about the child's engagement and performance in different occupations. Another good but subjective means to measure outcome is to set specific goals and objectives of treatment to measure the child's progress in the care package (Aquaro, Gallagher, Crocker, Goldkopf, Mulligan, Quirk, Rainey, and Tobias, 1992). The objectives set need to be small, observable, measurable, reliable and achievable within a set time scale.

An objective way to measure outcome is to assess the improvement of the child's behavioural pattern by using the ADHD Rating Scale – IV (DuPaul et al, 1998). Besides being useful for screening and diagnostic purposes, the ADHD Rating Scale is also designed to evaluate treatment outcome by calculating the Reliable Change Index by using the scores of the rating scales before and after treatment.

Another perspective to measure outcome is related to the process of care. The Measure of Processes of Care (King, Rosenbaum and King, 1995) could be used to measure parents' perceptions of the extent to which the health services they and their child(ren) received are family-centred. It is a well-validated and reliable self-report tool which also provides a means to assess family-centred behaviours of health care providers. The original version of MPOC is a 56-item questionnaire. As of 1998, there is a shorter, 20-item version (King, Rosenbaum and King, 1998) (see **Appendix F**). The MPOC contains five scales: 1) Enabling and Partnership, 2) Providing General Information, 3) Providing Specific Information about the Child, 4) Coordinated and Comprehensive Care for the Child and Family, and 5) Respectful and Supportive Care. It is a theoretically sound measure of family-centred service. The scales fit well with the key constructs about family-centred care found in the literature.

A Case Example

Daniel was diagnosed as having ADHD – Combined Type at the age of 6 years 2 months by using a multi-dimensional evaluation procedure. He presented a range of inattentive, hyperactive and impulsive behaviours both at home and school. He has difficulties in staying seated for different learning tasks. He needs constant movement stimulation or else he will fidget or squirm on his seat. He will call out in the classroom and try to get attention from his teacher. In the playground, Daniel tends to run about or interrupt other children's games. As he shouts out a lot, he has a very distinctive husky voice. A feedback session was arranged with both parents to go through the results of the assessment, to provide information on ADHD, and also to suggest a possible treatment package that could be provided by the service.

The occupational therapist did a school visit with Daniel's parents to share information with his teacher, learning support assistant and Special Needs Coordinator (SENCO) about the specific problems and needs of children with ADHD. In order to adopt a whole school approach in supporting Daniel to participate in different educational and social activities, the SENCO arranged a talk by the occupational therapist about ADHD for all teaching and support staff in the

school. The occupational therapist also provided the school with an Information Pack on ADHD so that they can have an up-to-date resource on ADHD for future reference.

An occupational therapy programme with specific goals and objectives was set up in conjunction with Daniel's teacher and parents. It includes specific behavioural management strategies and also sensory modulation techniques in order to improve Daniel's level of self-control and attentive behaviour. General classroom rules were set for the whole class as a supporting background for good behaviour, e.g. raise your hand before talking, walk in the school instead of running, keep your hands to yourself. As children with ADHD need immediate, regular and constant feedback to regulate their behaviour, a token economy system by using response cost was set up to develop desirable behaviour for Daniel, e.g. ability to complete a handwriting task which consists of four sentences within five minutes. The behavioural management programme needed to be consistent between home and school. In order to reduce his movement seeking behaviour, a Sit-and-Move Cushion (a special air inflatable wedge-shaped cushion) was provided so that Daniel can still get the necessary movement stimulation while staying seated on a chair. Other strategies were used to provide regular movement stimulation for him by using meaningful tasks, e.g. handing out learning materials for the teacher, taking a basket of books back to the library.

As children with ADHD are mostly visual-based learners, the use of different visual strategies was suggested e.g. a visual timetable (a visual chart using pictures or symbols to illustrate the sequence of learning activities throughout the day in school). The use of a colour coding system was suggested for indicating different signals e.g. the colour blue means quiet time. The occupational therapist also advised the teacher to adapt the classroom environment so that it is less stimulating for Daniel, e.g. a more calming colour scheme, mechanisms to control light intensity and noise level, and the amount of display of children's work. After a term of implementing the programme through regular meetings between the therapist, parents and teacher. Daniel gradually improved in his behavioural control. Both parents and teachers are able to carry on all the management strategies suggested by the occupational therapist.

STRENGTHS AND BENEFITS OF THE MODEL

The theoretical concepts, multi-dimensional evaluation and multi-faceted intervention procedures described in the model offer a unique orientation of practice in occupational therapy for children with ADHD. By addressing issues related to the child-task-environment interaction and participation in different occupations, it will send a message to parents, teachers and other team members about the full scope and depth of occupational therapy practice. The adoption a family-centred care approach in the delivery of the care package indicates the holistic practice in occupational therapy.

The use of a multi-dimensional evaluation model reflects the range of skills possessed by an occupational therapist. When the therapist interviews parents and teacher about a child, the range of questions will communicate the domains of concern in occupational therapy. The message will be that occupational therapy practice is not limited to the assessment and treatment of underlying dysfunctions, such as fine motor abilities or sensory processing functions. The practice encompasses broad arenas in different occupations, such as self-care, play, leisure, classroom activities, peer-group interaction and socialisation within the child's context.

A strength of the model is that it enables the therapist to consider and understand the complexities of factors which contribute to the child's problems in participating in different occupations. It provides an approach to identifying and communicating occupational performance difficulties in relationship to the interaction between the child, environment and task demands. A benefit of using the multi-dimensional evaluation is that it enhances the writing of goals and objectives in the child's individual education plan. Treatment goals and objectives can be more clearly linked to the requirements of the curriculum in different educational activities and the demands of the environment. Outcomes are easier to measure if the goals and objectives are written in functional terms. Teachers can see how the occupational therapy treatment plan attempts to assist the child's performance in the classroom.

In addition to this strength, the model offers a systematic approach to guide the therapist in making focused effective interventions in order to promote the child's participation in different purposeful activities. Intervention strategies are available to address issues related to the child, task, environment, parents and teachers, and the interaction amongst these factors. The model also helps therapists to adopt a broad scope of practice with multiple options for intervention e.g. consultative or advisory inputs, health education and promotion, direct or integrative therapy. Lastly, the model facilitates communication within and outside the profession about the role of occupational therapy for children with ADHD.

VALIDATING THE FORMULATED MODEL OF PRACTICE

As stated before, a model of practice provides guidelines for therapists on what to assess, how to assess and also what to do in the intervention processes. In order to validate a formulated model of practice, the first choice of action will be an outcome study of the efficacy of an assessment and treatment package based on the theoretical concepts of the model. At present, most formats of evaluation and intervention procedures are predominantly medically and psychologically based. There is no research on combining therapeutic methods used in occupational therapy and other psychological and behavioural approaches. It will be useful to expand the options by developing different combined treatments and validating their efficacy by using different outcome studies. The clinical experience of the author indicates that the integration of sensory integrative approaches with a psycho-educational programme for parents and teachers, behavioural and classroom management, and also treatment on associated developmental problems proved to be a good form of combined treatment. However, these clinical observations and experiences need to be supported by scientific research.

Informal data generated by the Consensus Development Research (reported in Chapter Five) indicates that there is no consistency in the areas of assessment and treatment within the current practice of occupational therapy for children with ADHD. These vary amongst therapists who are working in different service settings. Results of the National Survey (reported in Chapter Four) indicate that

certain reasons for non-involvement in working with children with ADHD were lack of knowledge and skills, and also lack of resources. In order to overcome these problems and any inconsistency in practice, an evidence-based, family-centred occupational therapy care package has been developed. The whole care package consists of 12 contacts within a time scale of three months (see Chapter Seven for details). This duration of the clinical pathway is consistent with most of the packages of care for different care groups (e.g. children with DCD) provided by paediatric occupational therapy services throughout the countries in the UK. The care package was quantified in such manner that it is easily replicated in different clinical settings and can also be used for further research studies. A multi-centred study was carried out to evaluate the process and outcome of this occupational therapy care package based on the formulated delineation model of practice for children with ADHD.

CONCLUSIONS

Within the UK, occupational therapy for children with ADHD is a small field of practice. Therapists need to acquire up-to-date knowledge of the clinical features, diagnostic criteria, etiology and contemporary theories of ADHD in order to make a significant contribution to the processes of evaluation and intervention. Therapists also need to acquire practical skills in different assessment procedures and treatment methods, and assimilate these into a model of occupational therapy practice. Models of practice are the sources of major theory building in the occupational therapy field (Kielhofner, 1995). They guide the clinical application efforts of the profession and therefore directly guide both practice and research.

In this chapter, the author has combined theoretical information based on data gathered from previous research studies, literature review and personal clinical experience, and organised it into an occupational therapy delineation model of practice for children with ADHD. This illustrates the interaction between the child, the task to be carried out by the child, and also the environment in which the child carries out the task. In order to achieve successful participation in different occupations, the goodness-of-fit amongst all these three factors needs to be

achieved. The model also highlights a new understanding of ADHD as complex, multifaceted clusters of dimensional impairments in neurological, psychological, and behavioural levels. In order to identify the “roots” of the disorder and also remediate multiple dysfunctions, a multi-dimensional model of evaluation and multi-faceted model of intervention are proposed.

The formulated model needs to be further validated through applied research, clinical practice and efficacy studies. The next chapter reports a multi-centred outcome study to validate the construct of the family-centred approach and also to examine the efficacy of an occupational therapy care package for children with ADHD. The results of this study are reported in Chapter Seven.

Chapter Seven

Process and Outcome Evaluation of an Occupational Therapy Care Package for Children with ADHD

“Developing, refining, and testing any theory are usually long-term processes. One person may take primary responsibility, or many people, sometimes distant in time and place, may participate. Basic scientific inquiry is a complex process consisting of many steps and is rarely a smooth journey from beginning to end; it involves fits and starts, false paths, circling back, wasted time, and occasionally being completely lost. Perseverance is requisite.”

(Mosey, 1992, p.156)

INTRODUCTION

In Chapter Six, an occupational therapy delineation model of practice for children with ADHD was described. It addressed some specific areas of human functioning related to children with ADHD and pertained to the practice of occupational therapy. According to Kielhofner (1992), for a model of practice to gain acceptance, it must be formally articulated, appeal to practitioners, and be serviceable, providing clear guidelines about what to assess and how to assess, and containing ideas which can be applied in some very concrete ways. Based on these characteristics and the conceptual framework of the delineation model, a family-centred occupational therapy care package was developed. This chapter reports a multi-centred study to evaluate the effectiveness of the care package and thereby to validate the model formulated.

In this chapter, details of the care package are summarised and the design and results of a multi-centred study are described and discussed. This study served to evaluate the process and outcome of the occupational therapy care package derived from the model of practice. According to Forer (1996), programme evaluation is a systematic procedure for monitoring the effectiveness and efficiency with which results are achieved following termination of services. Programme evaluation generally focuses on the processes of care for desired client outcomes, programme performance, and the cost-benefits of outcomes achieved. The study aims at answering two research questions:

- 1) Does a family-centred care approach produce positive parental perceptions of the care they and their children received?, and
- 2) Is a defined family-centred occupational therapy care package carried out over 3 months effective in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD?

PROTOCOL OF AN OCCUPATIONAL THERAPY CARE PACKAGE

The care package was based on the principles of family-centred care approach and also the theoretical and conceptual basis of evaluation and intervention described

in the delineation model. The author has taken into consideration the cost, time, resources and training involved in selecting different assessment and intervention components from the model (see Chapter Six for details).

The 3-Day Training Course

A team of 20 paediatric occupational therapists was selected from the four countries (see section on Methodology for details of the selection criteria and process) to attend a 3-day training course. The course consisted of comprehensive training sessions on each component of the research protocol. Participants in the training course were given a very comprehensive manual with details of all assessment and treatment procedures used in the research protocol (see **Appendix G** for the contents page of the manual). Appropriate assessment forms and treatment materials were provided.

The following points summarise the main components of the training course (see **Appendix H** for details of the Training Programme):-

1. An overall view of the research processes, including the research questions and objectives, research design, selection of subjects, obtaining consent, coding system for data protection and data collection for outcome measures.
2. An overall view of the condition, evaluation and intervention processes for children with ADHD (Chu, 2003b & c).
3. Principles of family-centred care approach (Hanft, 1989; Rosenbaum et al, 1998; Humphry & Case-Smith, 2001).
4. Components of multi-dimensional evaluation and multi-faceted intervention.
5. Documentation.
6. Processes of data collection and use of outcome measures.

Time Scale and Clinical Pathway of the Care Package

In this care package, the whole clinical pathway lasts for three months. There were potentially 12 weekly contacts (see **Figure 7.1**). The research therapist made direct contact with either the parents, the child's teacher, or both once a week to work on different components of the care package. The selected components of assessment and treatment for the care package are illustrated in **Figure 7.2**. The

Figure 7.1: Clinical Pathway of the Care Package

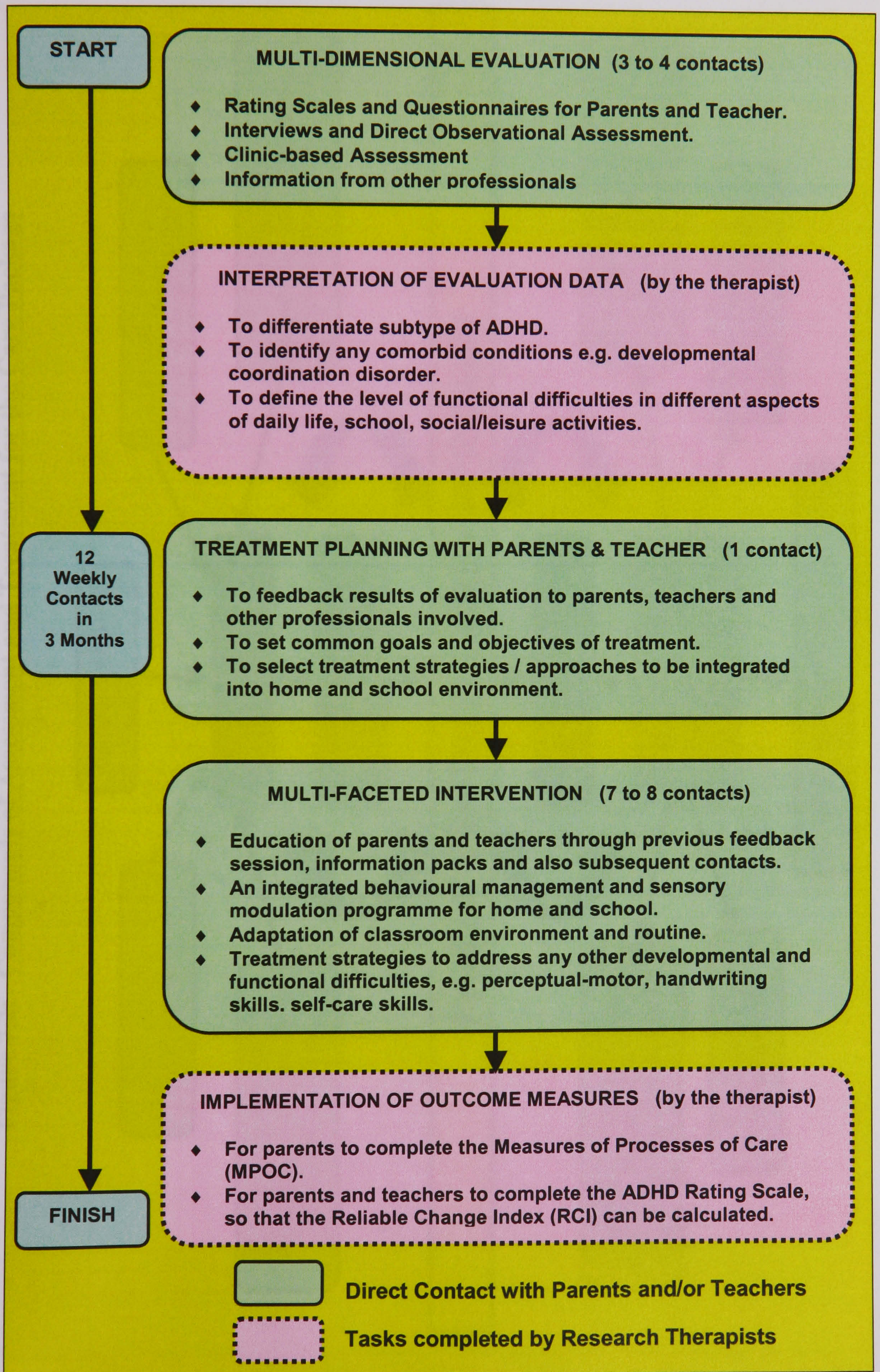
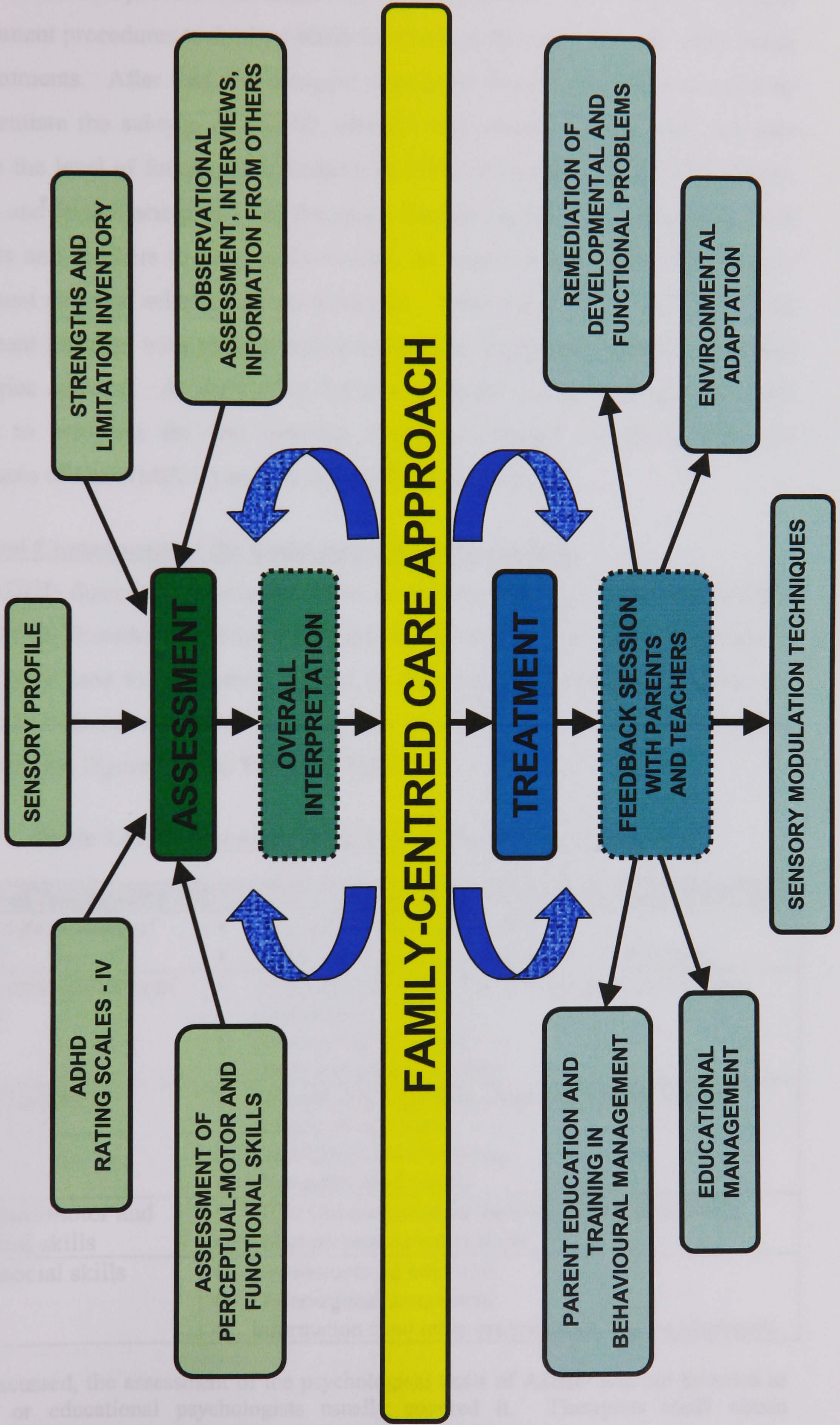


Figure 7.2: Components of Assessment and Treatment for the Care Package



whole evaluation process took about 3 to 4 weekly contacts to complete. Different assessment procedures took place either in school, at home or through clinic-based appointments. After that, the therapist interpreted the data collected in order to differentiate the subtype of ADHD, identify any comorbid conditions, and also define the level of functional difficulties in different aspects of daily life, school, social and leisure activities. The therapists then arranged a feedback session with parents and teachers to discuss the results, set common goals and objectives of treatment and also select treatment strategies. There were about 7 to 8 follow-up treatment contacts with parents and/or teachers to implement different treatment strategies selected. At the end of the care package, parents and teachers were asked to complete the two outcome measures selected i.e. the Measure of Processes of Care (MPOC) and the ADHD Rating Scales –IV.

Selected Components of the Multi-dimensional Evaluation

The ADHD diagnostic criteria described in the Diagnostic and Statistical Manual for Mental Disorder (4th Edition) (DSM-IV, American Psychiatric Association, 1994) were used for evaluation. Based on the delineation model of practice, the multi-dimensional evaluation used in this protocol consisted of the following elements (see Figure 7.2 and **Table 7.1** below):-

Table 7.1: Components of the Multi-dimensional Evaluation

Areas of Assessment *	Assessment Tools / Procedures
Neurological basis of ADHD	<ul style="list-style-type: none"> • Sensory Profile (Dunn, 1999). • Clinical observation of sensory-based behaviour.
Behavioural patterns of ADHD	<ul style="list-style-type: none"> • ADHD Rating Scale – IV Home and School versions (DuPaul et al, 1998). • Semi-structured interview. • Observational assessment
School factors	<ul style="list-style-type: none"> • Strength and Limitation Inventory: School Version (Dowdy et al, 1998). • Semi-structured interview. • Classroom observation
Perceptual-motor and functional skills	<ul style="list-style-type: none"> • DCD Questionnaire for parents (Wilson et al, 2000). • Other perceptual-motor tests.
Psychosocial skills	<ul style="list-style-type: none"> • Semi-structured interview. • Observational assessment. • Information from other professionals, e.g. psychologists.

* As discussed, the assessment of the psychological basis of ADHD was not included as clinical or educational psychologists usually covered it. Therapists could obtain information from psychologists if they had assessed the child.

After gathering all the assessment data, the research therapist analysed and interpreted the results based on the DSM-IV diagnostic criteria on ADHD. The therapist needed to differentiate the sub-type of ADHD, identify comorbid conditions that may contribute to the presentation of other associated problems, and also ascertain the child's functional level in different learning and daily life activities. The assessment data were then used for treatment planning and also outcome measures.

Selected Components of the Multi-Faceted Intervention

Because of the time and resource factors discussed, the following components of the multi-faceted intervention described in Chapter Six were selected in this care package (see Figure 7.2 and **Table 7.2** below):-

Table 7.2: Components of the Multi-faceted Intervention

Areas of Intervention	Treatment Methods / Strategies
Parental Education and Training	<ul style="list-style-type: none"> • Through a feedback session and also the provision of information packs (Jones et al, 1999 and CHADD, 2000). • Sharing information about the results of the evaluation helps to promote the understanding of the child's underlying dysfunctions, and their effect on the child's behaviour. • Through subsequent contacts to train parents and teachers to use different behavioural management strategies (Barkley, 1992, 1994, 1995 & 1998a).
Remediation of Sensory Integrative Dysfunction as a basis for ADHD.	<p>Use of different sensory modulation concepts and techniques selected from the:</p> <ul style="list-style-type: none"> • Alert Programme (Williams & Shellenberger, 1992 & 1994) • MORE Programme (Oetter et al, 1995) • Sensory Diet Programme (Wilbarger, 1995).
Environmental Adaptation	<ul style="list-style-type: none"> • Adaptation of home/classroom environment and routine by considering the sensory characteristics of the environment (Nackley, 2001) • Use of predictive visual timetable (Barkley, 1998a & Dowdy et al, 1998) in home and classroom. • Integrate different sensory modulation techniques into classroom routine, e.g. sensory diet (Wilbarger, 1995).
Educational Management	<ul style="list-style-type: none"> • Integrate different management strategies described in the Guide to Classroom Intervention for the Strengths and Limitation Inventory (Dowdy et al, 1998). • Help teachers to apply different behavioural management strategies (e.g. token economy) and sensory modulation techniques to regulate the child's behaviour in order to promote his/her engagement in different educational activities.
Remediation of Developmental and Functional Problems	<p>Use different treatment strategies or approaches related to the identified problems e.g.</p> <ul style="list-style-type: none"> • perceptual-motor skills training • handwriting skills training • self-care skills training • play and leisure skills training

Outcome Measures

After the implementation of the multi-faceted intervention programme, two outcome measures were used in collecting data for the process and outcome evaluation of the care package:-

1. For parents to complete the *Measure of Processes of Care – 20-item version (MPOC-20)* (King et al, 1998, see **Appendix F**).

The MPOC is a well-validated and reliable self-report measure of parents' perceptions of the extent to which the health services they and their children received are family-centred (King, King and Rosenbaum, 2004). It is a means of assessing family-centred behaviours of health care providers. It was developed by King et al (1995) and validated by samples of parents whose children range in age from 0 to 17+ years and who had a variety of neurodevelopmental disabilities or maxillofacial disorders. The MPOC was developed as a self-administered questionnaire suitable for use in research and clinical settings with parents. Its format as a measure that parents can complete on their own was chosen to ensure confidentiality of responses, to avoid any biases that may be introduced if administered as an interview, and to allow its use in mailed surveys which can cover a wide geographic area. For each item parents respond to a common question: "To what extent do the people who work with your child". A 7-point response scale is used. There is also a "not applicable" category.

The original version of MPOC is a 56-item questionnaire (King et al, 1995); as of 1998 there is a shorter, 20-item version – MPOC-20 (King et al, 1998). The validity evidence shows that MPOC-20 can capture parents' perceptions of caregiving regardless of the child's diagnosis or age. These findings support its use with parents of children with a broad range of health or development conditions and across children's ages (King et al, 2004).

All the 20 items are grouped into five scales: 1) Enabling and Partnership, 2) Providing General Information, 3) Providing Specific Information about the

Child, 4) Coordinated and Comprehensive Care, and 5) Respectful and Supportive Care (King et al, 2004) (see **Table 7.3**). A respondent's data yield five scores, one for each of the scales. There is no total score because it is thought to be more informative clinically to examine the relationships of the individual scales to other variables.

Table 7.3: Scales and Items of the MPOC-20

Scale Name	No. of Items in each Scale	Items belonging to each scale
Enabling and Partnership	3	4, 7, 8
Providing General Information	5	16, 17, 18, 19, 20
Providing Specific Information about the Child	3	2, 14, 15
Coordinated and Comprehensive Care	4	5, 6, 10, 12
Respectful and Supportive Care	5	1, 3, 9, 11, 13

2. For parents and teachers to complete another Home and School version of the *ADHD Rating Scale – IV* (DuPaul et al, 1998, see **Appendix E**) in order to calculate the Reliable Change Index. The index measures the efficacy of the care package in producing significant change in the child's behavioural pattern related to ADHD.

The ADHD Rating Scale - IV is based on the diagnostic criteria for ADHD as described in the DSM-IV. It is useful for screening, assessment, and the evaluation of treatment outcome. There are two versions – Home and School Versions, which are designed to be completed independently by a child's parents and teacher. The manual shows that there are normative data for children and young adults aged between 5 to 18 years old. There are 18 items in both versions. The selected items reflect the DSM-IV criteria as closely as possible while maintaining brevity. Analyses of different reliability and validity studies reported in the manual indicate that the Home and School Versions of the ADHD Rating Scale-IV have adequate psychometric properties for use as screening, diagnostic and treatment outcome measures.

METHODOLOGY

Research Questions and Objectives

There are two principal research questions and objectives:-

1. Question

Does a family-centred care approach produce positive parental perceptions of the care they and their children received?

Objective

To measure the parents' perceptions of the care they and their children received from the case occupational therapist through the implementation of a defined family-centred occupational therapy care package for children aged between 5 to 10 years old with ADHD.

2. Question

Is a defined family-centred, occupational therapy care package carried out over 3 months effective in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD?

Objective

To measure the outcome of a defined family-centred occupational therapy care package for children aged between 5 to 10 years old with ADHD.

Research Design

A framework of programme evaluation was used to assess the process in service delivery and outcome of the family-centred occupational therapy care package. **Process evaluation** is a developmental approach concerned with assessing service implementation and progress towards health gain objectives (FOCUS, 1999). It is related to the research question 1 on the degree of family-centredness in the delivery of the care package. Another aspect of programme evaluation is called **outcome evaluation** which is concerned with the assessment of the effectiveness of a service in achieving its objectives and an overall conclusion about the success of the service (FOCUS, 1999). It is related to the research question 2 on the effectiveness of the care package in producing significant changes in the behavioural patterns of children with ADHD.

For the **process evaluation** of the care package, a single-group posttest-only design was used. It is a form of non-experimental design in which the researcher manipulates the independent variable and then takes a post-manipulation measure on the dependent variable. In this instance, the independent variable was the care package and the dependent variable was the rating of the parents on the processes of care they perceived. Analysis of the descriptive statistics of the MPOC-20 constituted the post-manipulative measure of the process evaluation.

For the **outcome evaluation** of the care package, a single-group pretest-posttest design was used. It is a form of non-experimental design in which a group of subjects is measured on a dependent variable, the independent variable is manipulated, and a second measure on the dependent variable is taken. In this instance, the independent variable was the care package and the dependent variable was the rating of the child's behaviour before and after the implementation of the care package. The scores of the ADHD Rating Scales –IV before and after treatment were used to calculate the Reliable Change Index (RCI). When the value of RCI exceeded 1.96, it indicated that the change was not due to chance ($p < .05$). The calculation of the RCI will be discussed later in this chapter.

In order to avoid “experimenter effects” on the part of the author, a team of 20 paediatric occupational therapists was recruited and trained to implement the care package and collect relevant data for both the process and outcome evaluation. The author acknowledged that there might still be “experimenter effects” on the part of the research therapists that needed to be considered. The recruitment of these therapists will be discussed below.

Ethical Approval of the Study

The application for ethical approval for a multi-centred study proved to be an arduous, lengthy and complicated process. The chief investigator of the study needed to apply for approval from one of the Multi-Centre Research Ethics Committees (MREC) in the UK. Approval having been granted by a MREC, all the local researchers needed to submit various forms and documents to their Local Research Ethics Committees (LRECs) and Research Management and Governance

Committees (RM&GCs) for local approval. The whole process took up to 6 to 10 months. Ethical approval for this study was granted by the West Midlands MREC, and relevant Local Research Ethics Committees (LRECs) and Research Management and Governance Committees (RM&GCs) for each local researcher.

Selection and Training of Local Researchers

A team of 20 paediatric occupational therapists was recruited from the four countries in the UK. They were therapists who had participated in the consensus development research described in Chapter Five. Therapists who had expressed an interest in participating in the project were invited to complete an application form. The following selection criteria were used in the selection process:-

1. Service settings, i.e. those who had direct access to children with ADHD.

As children suspected of having ADHD may be referred to both child health and child psychiatry services, it is important to recruit therapists who are working in these two settings in the four countries. Those therapists who have direct access to children being referred for the diagnosis of ADHD were given priority as it is important that appropriate cases be identified for this study in a timely manner.

2. Years of clinical experience. There was a balance of junior and senior therapists.

The author wanted to see if the care package could be learned and implemented by therapists with different years of clinical experience. However, it would be difficult for new graduates to be involved without at least some clinical experience in working with children, families and teachers within a multi-disciplinary team. It was decided that therapists at Senior II grade and above would be eligible to apply. As far as possible, a team of therapists working at different grades from the four countries would be selected.

3. Knowledge and skills in working with families and children with ADHD and related developmental problem e.g. developmental coordination disorder (DCD).

Knowledge and skills in working with parents are essential in the delivery of a care package based on the family-centred care approach. Relevant clinical experience in working with children with DCD is also important as at least 50% of children with ADHD also have DCD. Armed with their existing knowledge and experience, therapists can learn specific assessment and treatment procedures related to children with ADHD during the 3-day course.

4. Knowledge and skills in using standardised tests.

Within the multi-dimensional evaluation protocol of the care package, therapists would be expected to administer different perceptual-motor tests and functional assessments to assess the child's developmental status and level of functional performance in different occupations. It would be impossible to cover the use of these standardised tests within the 3-day training course, as time should be allocated to specific assessment tools related to ADHD.

5. Experience in working within a multi-disciplinary team.

As children with ADHD require inputs from other professionals e.g. child psychiatrists, psychologists, family therapists, teachers, it is important for the therapist to share information and work collaboratively with other professionals involved. Therefore, having relevant experience in working within a multi-disciplinary team is one of the essential selection criteria.

Although the above criteria were set, the selection process also depended on the background and number of therapists who submitted an application. All selected therapists attended a 3-day Training Course as described previously to learn to implement a family-centred occupational therapy care package for children with ADHD. The attendance of the training course was free of charge in return of submission of data.

Therapists' Selection of Children

Each therapist was asked to select two children according to the following criteria:

1. Children aged 5 to 10 years old who were referred to the service because of concern related to ADHD.

Clinical experience indicated that most children suspected of having ADHD were referred to a clinical service after they entered primary school. Some children might be referred earlier while some might be referred at a later age. The age of referral seemed to be related to the knowledge and awareness of ADHD among the children's parents and teachers. Therefore the age range of 5 to 10 years old was selected. This age range also matched with the age limit within different standardised tests selected in the care package. Children selected for the study needed to have a diagnosis of ADHD confirmed by a medical practitioner e.g. child psychiatrist or paediatrician.

2. Children with average intellectual capacity, i.e. no identifiable learning disability.

Because of their lower cognitive functions children with learning disability always present problems in their attention control, regulation of activity level and behavioural organisation. They might be mistaken for children with ADHD. As a process of differential diagnosis, children with learning disability were excluded from the study because they needed different treatment strategies to promote their development. The existence of learning disability could be confirmed by report from a psychologist or teacher.

3. Children without other known neurological disorders, e.g. traumatic brain injury.

Children with ADHD have minimal dysfunction in their frontal lobe. As a result, they have problems in behavioural inhibition and executive functions. They are different from children with brain damage due to different neurological insults or accidents. For example, children with head injury due

to road traffic accidents may present behavioural patterns which mimic ADHD but with different aetiological factors. They will require different treatment approaches. Therefore, children with known neurological disorders were excluded from the study.

4. Children without other pervasive developmental disorder, including autism.

This criterion is consistent with one of the ADHD diagnostic criteria outlined in the DSM-IV. Children with pervasive developmental disorder present poor attention control, hyperactive and impulsive behaviours as part of the clinical picture of the condition. Their main problems are in the areas of social interaction and communication, and consequently they require different management approaches. Therefore, children with pervasive developmental disorder were excluded from the study.

5. Children without other assessed mental health problems, e.g. childhood schizophrenia.

Children with comorbid ADHD and other mental health problems require a much more complex treatment package than the care package used in this study. Therefore, children with other mental health problems were excluded from this study.

6. Children with normal birth and delivery i.e. children who were born preterm and with low birth weight were not considered.

As discussed in the Chapter Two on Literature Review, some children with low birth weight develop ADHD features when they get older (Botting et al, 1997 and Mick et al, 2002). However, these children do have a different brain mechanism from a child with a primary ADHD because of frontal lobe dysfunction. Clinical experience also indicated that children with preterm birth and low birth weight do require different treatment approaches from those used in the care package. Therefore, children with preterm birth and low birth weight were excluded from the study.

Initially, appropriate cases were identified by a child psychiatrist or paediatrician in discussion with parents and the research therapist. Parents were explained the aims of the study verbally and provided with the Information Sheet which outlined details of the processes involved (see **Appendix I**).

Obtaining Consent

Parental consents were obtained by asking parents to sign a consent form (see **Appendix J**). They were given an Information Sheet on the study so that they could make a decision on participation based on informed choice.

For children, an information sheet in picture format was developed (see **Appendix K**). Therapists needed to go through the stages of involvement with the child and ask the child to sign his/her name on the page. Section 4.2 of the Consent for Occupational Therapy (College of Occupational Therapists, January 2003) was used to guide therapists to work with children. For the child's GP and teacher, Information Sheets were developed to inform them of the purpose of the research project (see **Appendices L & M**).

Therapists were advised to be familiar themselves with the following documents and policies:-

- a. Seeking Consent: Working with Children (DoH, November, 2001).
- b. Consent for Occupational Therapy (College of Occupational Therapists, January, 2003).
- c. Local policies and procedures on consent.

Procedures of Data Collection and Coding System for Data Protection

In order to adhere to the Data Protection Act, a coding system was used to ensure that the identity of the families and children could not be recognised (see **Appendix N**). The allocated codes were used in all the forms and documentations to be sent to the Chief Investigator. The child's name and address had been removed. There were codes allocated to:-

- a. Each research therapist – in terms of Centre Number.
- b. Each child – in terms of Patient Identification Number (PIN)

Data collected were locked in a filing cabinet kept at the Chief Investigator's home. All participants agreed that all paper and electronic data would be kept for one year after the completion of the study. Paper data will be destroyed by using a paper shredder.

Outcome Measures and Method of Data Analysis

For the **process evaluation**, the descriptive statistics for the MPOC (**Appendix F**) were used to analyse the response from parents to the family-centred care they and their child received. In the scoring section of the MPOC Manual (King et al, 1995, P.54), the use of mean, standard deviation and ranges of scores was recommended in analysing the results. The use of mean in analysing ordinal data in the Likert Scale of MPOC is consistent with recommendations made by several authors in the field of research and statistics (Brown, 1976 and Kerlinger, 1986). However, the authors of the MPOC acknowledged that controversy existed in the field about the appropriateness of using parametric statistics with ordinal data. They decided to use mean, standard deviation and ranges of scores in scoring the MPOC, basing their decision on the argument made by Anderson, Basilevsky & Hum (1983) that ordinal data are often treated as interval data in social sciences, and the recommendation made by Streiner and Norman (1989) that ordinal data could be analysed with parametric statistics unless severely skewed.

As outlined in the MPOC Manual (King et al, 1995), a mean score for each of the five scales of the MPOC was obtained by computing the average of the items' ratings. It is calculated by adding the values of the valid responses and then dividing this sum by the number of the valid items in the scale. A mean score around 4 indicates that on average parents report that the service "sometimes" meets parents' needs on that scale. A mean score of 7 (or just slightly less than 7) indicates that needs are being met "to a great extent". A mean score of 1 (or very close to 1) denotes that parents' needs on that scale are "never" (or almost never) met. In addition to these descriptions for certain mean values, the mean plus the standard deviation and the range of scores provided useful information about how much variability or dispersion there was in the data set.

In view of the recent recommendation for analysing ordinal data in the Likert Scale (Giles, 2002), other descriptive statistics (i.e. mode, median, and quartiles) will also be used to analyse the data obtained in the MPOC completed by parents. This helps to avoid controversy in the use of different statistics when analysing ordinal data. It will also provide a richer analysis of the data obtained.

For the **outcome evaluation**, the Reliable Change Index (RCI) for each subject was calculated by comparing the scores of the ADHD Rating Scale-IV (Appendix E) before and after treatment. According to Jacobsen and Truax (1991, cited in DuPaul et al, 1998), RCI is equal to the difference between a child's pretreatment score and posttreatment score, divided by the standard error of difference between the two test scores. In the Manual of the ADHD Rating Scale-IV (DuPaul et al, 1998), two tables of the Standard Errors of Difference for the School Version and Home Version are available for calculating the RCI. When the value of RCI exceeded 1.96, it indicated that the change from pretreatment to posttreatment is not due to chance ($p < .05$). Thus, the RCI serves as a measure of the degree to which an improvement in functioning is likely due to the effects of treatment rather than to imprecise measurement.

RESULTS

Characteristics of Therapists Participating in the Study

Table 7.4 outlines the demographic data of the 20 therapists who participated in the study. There were 11 therapists from England, 4 from Scotland, 2 from Wales and 3 from Northern Ireland. A majority of the therapists were working at Senior I grade i.e. 55%. There was only one therapist at Senior II grade and the rest were at Clinical Specialist grade (i.e. 15%), Head III grade (i.e. 20%) and one senior therapist in independent practice for a local primary care trust. Most of these therapists worked in a child health setting within the community (65%). There were 7 therapists (i.e. 35%) who worked in child psychiatry setting in England and Scotland but none in Wales and Northern Ireland. In terms of their years of working experience in all clinical areas of occupational therapy, this ranged from 6

to 34 years with a mean of 17.7 years and standard deviation of 8.5. For their experience in working with children, this ranged from 2.5 to 34 years with a mean of 12.6 years and standard deviation of 8.9.

Number and Demographic Characteristics of the Children

The target of the study was to have 40 case studies completed by 20 local researchers from the four countries in the UK. Unfortunately, owing to various unavoidable reasons, only the data of 20 children could be used for this study. The reasons for the reduction in the number of case studies were related to:-

1. The fact that all local researchers experienced undue delay in obtaining local approval from the LRECs and RM&GCs. This was mainly caused by the lack of understanding of the standard procedures in processing multi-centred research application on the part of these committees, despite the fact that the study had been approved by the West Midlands MREC on 9th December, 2003. Delays were also due to “sponsorship” queries and changing roles / responsibilities allocated to the university. This delayed the implementation of the case studies of 4 local researchers within the time scale of this study. This accounted for the loss of 8 case studies.
2. One local researcher was off sick during the course of the research. This accounted for the loss of 2 case studies.
3. One local researcher was on maternity leave and could not implement the whole care package within the time scale. This accounted for the loss of 2 case studies.
4. One local researcher did not follow all the assessment and treatment components specified in the care package: she used information about ADHD Rating Scales administered 6 months before the commencement of the care package. As a result, data provided could not be used. This accounted for the absence of 2 case studies.
5. One local researcher identified that the two cases selected did not actually have ADHD but Autistic Spectrum Disorder. This accounted for the loss of 2 case studies.

6. One local researcher changed job at the opening stage of the study and could not identify suitable subjects in her new job. This accounted for the loss of 2 case studies.
7. Two local researchers had one of their cases moved out of the area and could not complete the care package. This accounted for the loss of 2 case studies.

Of the 20 case studies submitted successfully, their demographic data are presented in **Table 7.5**. There were 18 boys and 2 girls. The mean age for the 18 boys was 91.3 months (7 years 7.3 months), with a range of 62 months (5 years 2 months) to 128 months (10 years 8 months). The mean age for the two girls was 103 months (8 years 7 months), with a range of 102 months (8 years 6 months) to 104 months (8 years 8 months).

Table 7.5: Demographic Characteristics of the 20 Children

Characteristics	Boys	Girls
Total N = 20	N = 18	N = 2
Age Range	62 Months to 128 Months (5 years 2 months to 10 years 8 months)	102 Months to 104 Months (8 years 6 months to 8 years 8 months)
Mean Age	91.3 Months (7 years 7.3 months)	103 Months (8 years 7 months)
Standard Deviation	18.6 Months	1.4 Months

N = Number of subjects

Clinical Characteristics of the 20 Children

All children were assessed by using different assessment procedures specified in the care package. Information obtained was useful for the therapists in order to differentiate different subtypes of ADHD, identify underlying sensory processing dysfunctions, evaluate the degree of comorbidity with Developmental

Coordination Disorder (DCD), and plan the treatment programme by selecting appropriate components within the multi-faceted intervention model described. Although these data will not be used for measuring outcomes of the care package, they are useful in analysing the specificity of each case.

The children's clinical characteristics were presented in the following areas:-

1. The **subtypes of ADHD** to which they belonged. Categorisation was primarily based on the results of the ADHD Rating Scales and other assessment procedures administered by the research therapists e.g. classroom observation. The subtypes included:-
 - a. ADHD Predominantly Inattentive Type (ADHD-IA).
 - b. ADHD Predominantly Hyperactive-Impulsive Type (ADHD-HI).
 - c. ADHD Combined Type (ADHD-C).
 - d. ADHD Not Otherwise Specified (ADHD NOS).

2. The **types of sensory processing dysfunctions** that they presented. Categorisation was based on the data from the Sensory Profile (Dunn, 1999) which provided information on 5 categories of sensory processing dysfunctions (see **Table 7.6** below). A child could have behavioural features related to more than one category.

Table 7.6: Categories of Sensory Processing Dysfunctions

Categories	Contributing to Behavioural Features
1. Poor Registration	Uninterested, dull affect, withdrawn, overly tired, apathetic, self-absorbed.
2. Sensitivity to Stimuli	Distractible, hyperactive.
3. Sensation Seeking	Active, fidgety, excitable.
4. Sensation Avoiding	Resistant to change, reliant on rigid rituals.
5. Mixed Patterns	This category will be used when the criteria for the above 4 categories are not completely met but the child still presents a mixture of behavioural features related to more than one category.

3. The **absence or presence of DCD** identified in each child. Categorisation was based on the total score of the DCDQ and also results of different motor tests administered by the research therapists. The degree of DCD was described as follows:-
- a. definitely indication of DCD
 - b. suspected of having DCD
 - c. probably not DCD

The clinical characteristics of each child are presented in **Table 7.7**. Children were arranged in the order of their chronological ages. Overall, there were 5 children (25%) identified as having the Inattentive Type, 9 children (45%) identified as having the Combined Type, and 6 children (30%) with behavioural patterns which could not be differentiated who were put under the category of ADHD Not-Otherwise-Specified (NOS). There was no child with the Hyperactive-Impulsive Type in this study. According to their sensory processing dysfunctions, a majority of the children (12 i.e. 60%) presented Sensory Seeking Pattern, 1 child (5%) presented Sensitivity to Stimuli Pattern, 1 child (5%) presented combined Sensitivity to Stimuli and Sensory Seeking Patterns, while 6 children (30%) presented mixed patterns. According to their degree of DCD, 11 children (55%) presented definite problems in their motor skills, 5 children (25%) were suspected of having DCD, while 4 children (20%) had no problems in their motor skills.

Outcomes of the ADHD Rating Scales

In all the cases, scores for both the home and school versions of the ADHD Rating Scales were obtained before and after the completion of the care package. There were three cases in which no scores were obtained for the posttreatment school version of the ADHD Rating Scale as the research therapists did not get any response from the child's teacher owing to the commencement of Summer holiday. The Reliable Change Index (RCI) for each child was calculated and presented in **Table 7.8**. As stated, if the value of RCI exceeded 1.96, it indicated that the change from pretreatment to posttreatment is not due to chance ($p < .05$) but to the effectiveness of the care package.

Table 7.7: Clinical Characteristics of the 20 Children

Subjects	Sex / Age	Subtypes of ADHD			Sensory Processing Dysfunctions				Comorbid with DCD				
		IA	HI	C	NOS	P.Reg	S.Stim	S.Seek	S.Avoi	Mixed	Definitely	Suspected	Prob. Not
Case 1	M / 5-2			✓			✓				✓		
Case 2	M / 5-7				✓		✓				✓		
Case 3	M / 6-0				✓		✓				✓		
Case 4	M / 6-0	✓							✓				✓
Case 5	M / 6-5			✓			✓				✓		
Case 6	M / 6-11			✓			✓				✓		
Case 7	M / 7-0			✓			✓				✓		
Case 8	M / 7-0			✓					✓				✓
Case 9	M / 7-11			✓			✓				✓		
Case 10	M / 8-0			✓					✓		✓		
Case 11	F / 8-6			✓			✓						✓
Case 12	M / 8-7				✓				✓		✓		
Case 13	F / 8-8	✓							✓		✓		
Case 14	M / 8-10	✓					✓				✓		
Case 15	M / 8-11				✓		✓						✓
Case 16	M / 9-0	✓					✓				✓		
Case 17	M / 9-2				✓		✓					✓	
Case 18	M / 9-2				✓		✓				✓		
Case 19	M / 9-5			✓			✓					✓	
Case 20	M / 10-8	✓							✓		✓		

Keys: IA = ADHD Inattentive Type HI = ADHD Hyperactive-Impulsive Type C = ADHD Combined Type NOS = ADHD Not Otherwise Specified
P.Reg = Poor Registration S.Stim = Sensitivity to Stimuli S.Seek = Sensory Seeking S.Avoi = Sensory Avoidance Mixed = Mixed Patterns
DCD = Developmental Coordination Disorder

Table 7.8: Outcomes of the ADHD Rating Scale – Home and School Versions

Subject Sex, CA	Version	Pretreatment Scores			Posttreatment Scores			SED			RCI		
		IA	HI	Total	IA	HI	Total	IA	HI	Total	IA	HI	Total
Case 1 M, 5-2	Home	18	21	39	14	15	29	3.37	2.94	5.46	1.19	2.04*	1.83
	School	7	6	13	6	3	9	3.59	3.85	6.53	0.28	0.78	0.61
Case 2 M, 5-7	Home	25	24	49	19	20	39	3.37	2.94	5.46	1.78	1.36	1.83
	School	25	27	52	15	16	31	3.59	3.85	6.53	2.79*	2.86*	3.22*
Case 3 M, 6-0	Home	21	26	47	14	22	36	3.37	2.94	5.46	2.08*	1.36	2.02*
	School	18	26	44	-	-	-	3.59	3.85	6.53	-	-	-
Case 4 M, 6-0	Home	17	17	34	23	23	46	3.37	2.94	5.46	-1.78	-2.04	-2.20
	School	16	17	33	14	20	34	3.59	3.85	6.53	0.56	-0.78	-0.15
Case 5 M, 6-5	Home	22	25	47	16	13	29	3.37	2.94	5.46	1.78	4.08*	3.30*
	School	9	11	20	7	9	16	3.59	3.85	6.53	0.56	0.52	0.61
Case 6 M, 6-11	Home	21	24	45	11	15	26	3.37	2.94	5.46	2.97*	3.06*	3.48*
	School	21	23	44	-	-	-	3.59	3.85	6.53	-	-	-
Case 7 M, 7-0	Home	20	19	39	20	19	39	3.37	2.94	5.46	0.00	0.00	0.00
	School	15	18	33	17	8	25	3.59	3.85	6.53	-0.56	2.60*	1.23
Case 8 M, 7-0	Home	14	25	39	13	20	33	3.37	2.94	5.46	0.30	1.70	1.20
	School	20	20	40	20	20	40	3.59	3.85	6.53	0.00	0.00	0.00
Case 9 M, 7-11	Home	26	26	52	19	17	36	3.37	2.94	5.46	2.08*	3.06*	2.93*
	School	25	21	46	22	19	41	3.59	3.85	6.53	0.84	0.52	0.77
Case 10 M, 8-0	Home	18	21	39	14	20	34	3.54	2.77	5.37	1.13	0.36	0.93
	School	24	23	47	21	21	42	3.99	3.95	6.93	0.75	0.51	0.72

Keys: CA = Chronological Age IA = Inattention Subscale HI = Hyperactivity-Impulsivity Subscale * = level of significance ($p < .05$)
 SED = Standard Errors of Difference (figures from Test Manual) RCI = Reliable Change Index

Table 7.8: Outcomes of the ADHD Rating Scale – Home and School Versions (Continued)

Subject Sex, CA	Version	Pretreatment Scores			Posttreatment Scores			SED			RCI		
		IA	HI	Total	IA	HI	Total	IA	HI	Total	IA	HI	Total
Case 11 F, 8-6	Home	21	22	43	18	16	34	2.88	2.01	4.12	1.04	2.99*	2.18*
	School	26	27	53	20	18	38	3.42	3.01	5.64	1.75	2.99*	2.66*
Case 12 M, 8-7	Home	24	14	38	19	13	32	3.54	2.77	5.37	1.41	0.36	1.12
	School	17	17	34	14	14	28	3.99	3.95	6.93	0.75	0.76	0.87
Case 13 F, 8-8	Home	24	12	36	14	13	27	2.88	2.01	4.12	3.47*	-0.50	2.18*
	School	17	12	29	12	9	21	3.42	3.01	5.64	1.46	1.00	1.42
Case 14 M, 8-10	Home	24	15	39	18	15	33	3.54	2.77	5.37	1.70	0.00	1.12
	School	19	16	35	9	8	17	3.99	3.95	6.93	2.51*	2.03*	2.60*
Case 15 M, 8-11	Home	18	18	36	20	18	38	3.54	2.77	5.37	-0.56	0.00	-0.37
	School	15	2	17	20	2	22	3.99	3.95	6.93	-1.25	0.00	-0.72
Case 16 M, 9-0	Home	25	9	34	8	6	14	3.54	2.77	5.37	4.80*	1.08	3.72*
	School	24	14	38	16	5	21	3.99	3.95	6.93	2.01*	2.28*	2.45*
Case 17 M, 9-2	Home	26	27	53	7	7	14	3.54	2.77	5.37	5.37*	7.22*	7.26*
	School	2	7	9	-	-	-	3.99	3.95	6.93	-	-	-
Case 18 M, 9-2	Home	25	22	47	24	24	48	3.54	2.77	5.37	0.28	-0.72	-0.19
	School	14	21	35	16	20	36	3.99	3.95	6.93	-0.50	0.25	-0.14
Case 19 M, 9-5	Home	27	26	53	24	21	45	3.54	2.77	5.37	0.85	1.81	1.15
	School	20	23	43	19	19	38	3.99	3.95	6.93	0.25	1.01	0.72
Case 20 M, 10-8	Home	19	14	33	13	9	22	3.54	2.77	5.37	1.70	1.81	2.05*
	School	20	7	27	12	3	15	3.99	3.95	6.93	2.01*	1.01	1.73

Keys: CA = Chronological Age IA = Inattention Subscale HI = Hyperactivity-Impulsivity Subscale * = level of significance ($p < .05$)
 SED = Standard Errors of Difference (figures from Test Manual) RCI = Reliable Change Index

Overall, all except 3 children (i.e. 85%) showed improvement in the scores before and after treatment. There were 13 children (65%) had significant changes of scores in at least one of the subscales, and 11 children (55%) showed significant changes of scores in either one or both the total scales in the whole ADHD Rating Scales. These figures might be higher if scores for the three missing school version of the ADHD Rating Scales were available, as they were children who showed significant changes in the home version of the ADHD Rating Scale. 3 children (15%) showed a slight deterioration in the scores after treatment.

Outcomes of the MPOC-20

The descriptive statistics for the five scales of the MPOC-20 are reported in **Table 7.9**. In the MPOC Manual, the use of mean, standard deviation and range of scores is recommended to analyse the data. As stated, a mean score around 4 indicates that on average parents report that the service “sometimes” meets parents’ needs on that scale, and a mean score of 7 (or just slightly less than 7) indicates that needs are being met “to a great extent”. The highest mean score (6.48) obtained was in the scale of “Coordinated and Comprehensive Care”, while the lowest mean score (5.67) was in the scale of “Providing General Information”. Overall, the mean scores for all the five scales were higher than the score of 4. In examining the scores within -1 SD and $+1$ SD, most of the scores were above 5 with only the score for the scale “Providing General Information” at 4.25. For the range of scores from minimum to maximum, only two parents gave low scores of 2 and 3. The overall results indicated that parents experienced good levels of family-centred care delivered by the research therapists when implementing the care package.

As discussed, controversy existed in using parametric statistics with ordinal data like those used in the MPOC. The mode, median and quartiles were calculated for the five scales in order to provide richer analysis of the data collected even though not recommended by the original authors. As indicated in Table 7.6, the mode for the five scales was 7 “to a great extent” with the exception of the scale “Providing General Information” which had two values of mode at 6 and 7. The median for the five scales was all at and above 6. They were consistent with the mean values calculated for each scale. In order to obtain an appropriate measure of dispersion

Table 7.9: Descriptive Statistics for the Measure of Processes of Care (MPOC-20)

Scale Name	Mean (M)	SD	Scores within M ± SD	Min	Max	Range	Mode	Median	Quartiles		
									25%	50%	75%
Enabling and Partnership	6.23	1.02	5.21 to 7.25	5	7	2	7	6.67	6.00	6.67	6.92
Providing General Information	5.67	1.42	4.25 to 7.09	2	7	5	6*	6.00	5.05	6.00	6.75
Providing Specific Information about the Child	6.37	0.98	5.39 to 7.35	5	7	2	7	6.67	6.08	6.67	7.00
Coordinated and Comprehensive Care	6.48	0.78	5.70 to 7.26	3	7	4	7	6.89	6.00	6.89	7.00
Respectful and Supportive Care	6.42	0.70	5.72 to 7.12	4	7	3	7	6.80	5.75	6.80	6.95

Keys: M = Mean SD = Standard Deviation Min = Minimum Max = Maximum * more than one mode (6 and 7), the lower value is reported.

of the scores, quartiles were used for all the five scales. Quartiles are defined as those values that divide the distribution of scores into fourths (Howell, 1992). There are three inter-quartile ranges at 25%, 50% and 75%. The 50% inter-quartile is the same as the median. As shown in Table 7.9, the lowest score at 25% inter-quartile was 5.05, the lowest score at 50% was 6.00, and the highest score at 75% inter-quartile was 7.00. This indicated that 50% of the scores collected fell within 6 to 7. The analysis of the data by using mode, median and quartiles was also consistent with the results using mean, SD and range of scores.

DISCUSSION

Demographic Characteristics of the 20 Therapists

As illustrated in Table 7.4, therapists were selected from the four countries, with England having the higher number because of the larger population size. There was a good mix of therapists working at different grades and service settings. A majority of the therapists had a good level of clinical experience working with children, with 12.6 mean years of experience. Although factors related to the grade, work setting and years of experience of the research therapists were not used in the process and outcome evaluation, the author acknowledged that these factors could have a bearing upon the effectiveness of the care package. These factors will be discussed later on in this chapter.

Demographic and Clinical Characteristics of the 20 Children

The higher ratio of boys to girls in this study matches with the author's clinical experience. Documentation of ADHD in different publications shows that there are usually many more boys than girls being referred to a clinical service (APA, 1994; Gomez et al, 1999 and NICE, 2000). Girls with ADHD usually present with the Inattentive Type (Hutchins, 1994). Of the two girls (cases 11 and 13) in this study, one was identified as having the Inattentive Type

Regarding the whole cohort of 20 children, it was unusual to have 5 children (25%) (cases 4, 13, 14, 16 and 20) identified as having the Inattentive Type as they are not usually identified and referred to a clinical service until a later age in their

education (Wodrich, 1994). Children with the Inattentive Type do have a different behavioural pattern from children with the Hyperactive-Impulsive Type and the Combined Type. It was previously believed that the Inattentive Type might have different aetiological factors and was best considered as a separate disorder (Carlson et al, 1999). In examining the types of sensory processing dysfunctions in these five children, all except one did not have the typical Sensory Seeking Pattern identified in children with ADHD (Dunn, 1999; Dunn and Bennett, 2002). They either presented a mixed pattern or a pattern opposite to the Sensory Seeking Pattern, i.e. the Sensitivity to Stimuli Pattern. The clinical characteristics of these five children did support the argument that children with the Inattentive Type do have different underlying dysfunctions. Therefore, it is important to assess their underlying neurological functions in order to decide on the choice of treatment approaches. This finding further reinforced the importance of adopting the multi-dimensional evaluation procedures advocated in the model of practice.

Of the other 15 children, most had the Combined Type which is the most common subtype of ADHD referred to a clinical service. Six children were classified as ADHD Not Otherwise Specified (NOS) as it was often not possible to delineate a neat pattern among some children though they did present obvious features of ADHD. A majority of the children did present the Sensory Seeking Pattern commonly identified in children with ADHD. This is consistent with the recent research findings by Mangeot et al (2001) and Dunn and Bennett (2002). These data supported the use of sensory integrative treatment techniques as part of the multi-faceted treatment programme.

Over half of the children in this study presented comorbidity with Developmental Coordination Disorder (DCD). This is consistent with the research findings by Gillberg and Kadesjo (2000) that the prevalence of comorbid ADHD and DCD is as high as 50%. These data supported the importance of assessing other developmental skills as part of the multi-dimensional evaluation model since most children with ADHD referred to a clinical service do present problems in either gross motor skills, fine motor skills or both (Whitmont and Clark, 1996; Harvey and Reid, 1997; Piek et al, 1999; Johnson and Rosen, 2000; Christiansen, 2000; Pitcher, Piek and Hay, 2003; and Tseng, Henderson, Chow and Yao, 2004).

The clinical characteristics of these 20 children had consistent links to previous research findings of children with ADHD. This suggested that the study used a reasonably representative sample.

Efficacy of the Care Package as Measured by the ADHD Rating Scales

One of the unique features of the care package was the combination of intervention strategies at the neurological, psychological and behavioural levels. It aimed at empowering parents and teachers to manage the child's behaviours by using different treatment strategies, which hopefully should be more long lasting than medication. Another unique feature was the family-centred care approach in service delivery. It made the whole care package one unique entity that was very different from other combined treatment methods. As measured by the posttreatment ADHD Rating Scales, a majority of the cases showed improvement in the scores after the implementation of the care package. Over half of the cases had significant changes of scores (as indicated by the value of the Reliable Change Index in Table 7.8) in at least one of the subscales or in one or both of the total scales of the ADHD Rating Scales. It was interesting to note that most significant changes of scores were related to the home version of the ADHD Rating Scale. This could be related to the family-centredness of the care package or the fact that it was more difficult to make changes within the school environment.

It is important to note that no treatment for ADHD has been identified to produce one hundred percent positive results. In view of the short duration of the treatment component of the care package (i.e. 7 to 8 contacts within two months after the multi-dimensional evaluation), the results were encouraging and comparable to other efficacy studies using different forms of treatments. For example, in the 14 months multimodal treatment study of children with ADHD (MTA Cooperative Group, 1999), parents and teachers reported a decline of approximately 50% in inattentive and hyperactive/impulsive symptoms for children in the medication only and combined medication and behavioural treatment groups. Within the MTA study, for children receiving routine community care, the decline reported was in the 25% range and was comparable to those reported for children receiving behavioural treatment only.

In another recently published multimodal study in New York and Montreal, 103 stimulant-responsive children with ADHD (aged 7-9) were randomized for 2 years to a) methylphenidate treatment alone; b) methylphenidate combined with multimodal psychosocial treatment that included parent training and counselling, academic assistance, psychotherapy, and social skills training, or 3) methylphenidate plus attention control treatment that excluded specific aspects of psychosocial intervention (Klein, Abikoff, Hechtman and Weiss, 2004). Results of this study indicated that this specific form of psychosocial-based combined treatment (medication with multimodal psychosocial treatment) did not lead to better social functioning (Abikoff, Hechtman, Klein, Gallagher, Fleiss, Etcovitch, Cousins, Greenfield, Martin and Pollack, 2004), better achievement and emotional status (Hechtman, Abikoff, Klein, Weiss, Respitz, Kouri, Blum, Greenfield, Etcovitch, Fleiss and Pollack, 2004), or symptomatic improvement (Abikoff, Hechtman, Klein, Weiss, Fleiss, Etcovitch, Cousins, Greenfield, Martin and Pollack, 2004b) in children with ADHD compared with either methylphenidate alone or methylphenidate plus attention control treatment. These results suggested that it is important to explore other forms of combined treatment such as the multi-dimensional one adopted in this multi-centred study (i.e. treatment at neurological, psychological and behavioural levels).

The results of this multi-centred study could provide a stepping stone for developing a form of intervention to replace or reduce the use of medication treatment which mainly provides temporary relief of the signs and symptoms of ADHD. As argued by Taylor and Hemsley (1995), medication must not become the first, and definitely not the only, line of treatment for children with ADHD. This argument was supported by Jouglin and Zwi (1999), namely that clinicians should try other forms of intervention before considering the use of medication. It is important to note that the average positive response rate in using medication as a single treatment modality was found to be 70% (Spencer, Biederman, Wilens, Harding, O'Donnell and Griffin, 1996). Once the effect of medication subsides, the child will return to his or her original behavioural state. Therefore, other forms of treatment which could have a long-lasting effect should be explored. For example, enabling parents to use different behavioural and sensory modulation

techniques, teaching the children different coping strategies and empowering teachers to adapt the learning environment and select appropriate tasks for a child with ADHD. These could have a long-lasting effect in changing and maintaining the child's behavioural pattern.

Three cases (cases 4, 15 and 18) showed deterioration in the scores after the treatment. Two of these three children (cases 15 and 18) were under the same research therapist. This negative treatment outcome could be just a coincidence. Or, there may have been specific factors related to the therapist in the implementation of the care package e.g. years of clinical experience. However, the sample in this study is too small for the matter to be satisfactorily resolved. For further research regarding the care package, it might be helpful to explore factors related to the research therapists, e.g. the years of clinical experience of the therapists, the range of post-graduate training completed, the service setting in which they work.

The Degree of Family-Centredness in the Delivery of the Care Package as Measured by the MPOC-20

Parental care for a child with a disability is an enormous responsibility, one that can far exceed that of typical parental care. While most parents adapt well to the situation of caring for a child with a disability, some do not (Raina, O'Donnell, Schweltnus, Rosenbaum, King, Brehaut, Russell, Swinton, King, Wong, Walter and Wood, 2004). Shelton, Jeppson and Johnson (1987) highlighted that parent-therapist collaboration is the spirit of family-centred care. In the care package, parent-therapist collaboration is vitally important in planning and providing services for the child with ADHD. Though different, the perspectives of both parents and therapists need to be taken account of. While therapists can offer the expertise of their skills and knowledge gained from working with a number of children, parents are the only ones who can contribute information about their particular child in all settings. Parent-therapist collaboration can lead to more comprehensive and more appropriate care plans that are individually tailored to both the child's and family's strengths and needs. The roles of occupational

therapists in parent-therapist collaboration are a) to support the family, b) to train and educate parents in the care of their child with ADHD, and c) to promote positive parent-child interactions.

The positive results of the MPOC-20 supported the importance of parent-therapist collaboration since most parents reported gains in confidence in managing their children with ADHD. The only weaker score was in the scale of "Providing General Information". In examining the five specific items within this scale, improvement could be made in the following areas of the care package: a) providing opportunities for the entire family to obtain information, b) having information available in various forms, such as booklet, kit, video, and c) providing advice on how to get information or to contact other parents. Some parents in their qualitative comments actually mentioned these areas for improvement.

Although the MPOC-20 was used as an outcome measure in this study, MPOC-56 is a tool that is still particularly useful for research and a more in-depth assessment. The additional content of MPOC-56, having more items within each scale, provides more concrete ideas for improvement. For any further larger scale study, the MPOC-56 should be used.

In order to promote a family-centred care approach among occupational therapists, a self-assessment version of the MPOC for service providers could be used (MPOC-SP; Woodside, Rosenbaum, King and King, 2001). The MPOC-SP generates information from the perspective of those who provide services to children with disabilities and their families. It would be useful to incorporate the MPOC-SP as part of the training programme of the care package for therapists. It was recognised by some research therapists that even just going through the items of the MPOC helped them to acquire knowledge when delivering services in a family-centred manner.

Limitations of the Study

Although positive results were achieved in this study, caution should be exercised in generalising the results to the whole population of children with ADHD, given the small sample size of the study, the lack of randomisation in the selection of subjects, and also the lack of a control group. There might also be “experimenter effects” on the part of the research therapists in collecting the data. This eventuality could be minimised by having a separate person to collect data from the therapist who implemented the care package. A further larger scale study needs to be carried out using a randomised control trial. It is also important to control and examine the influence of different variables. For example, the duration of the care package, the combination of different treatment components, specific factors related to the knowledge and skills of the research therapists, educational levels and cultural background of the parents, and also factors associated with school and teachers such as the teaching style of the teacher.

As most effective outcomes were related to the home environment, it would be difficult to come to a firm conclusion about the efficacy of the care package within the school environment. Consequently, it is important to strengthen the type of inputs that could be provided to schools if a larger scale randomised control trial is to be carried out. For example, a structured training programme for school staff could be developed in order to promote the understanding of children with ADHD. It would help to develop a whole school approach in supporting and managing children with ADHD. It might also be helpful to extend the duration of the care package in order to provide more regular support to the class teacher, though this carries resource implications.

Another limitation was the lack of information about the long lasting effect of the care package. This could be overcome by re-assessing this cohort of 20 children in 6 and 12 months time to see whether or not they still maintain the same level of improvement over time. However, it may be difficult to measure the child’s behavioural status in school, as there will be changes in staffing and the learning environment within a 12 months period and there may also changes in the child’s

behaviour. Therefore, measures should be focused on parental perceptions of the child's behaviour and also direct observation of the child within the home environment.

Although there were various limitations, this study should be viewed as a significant initial step in the ongoing development of a model of occupational therapy practice for children with ADHD. Some of these issues concerning the limitations of the study will be further discussed in the next section

CRITICAL EVALUATION AND FACTORS TO BE CONSIDERED FOR FUTURE STUDY

As the first study of its kind, it has built the foundation for the model by examining the effectiveness of a care package articulated in a training manual, which is simple enough to be understood by therapists, and applied in some very concrete ways (Kielhofner, 1992). However, there are many questions including those below lefts unanswered. Future research should focus on answering some of these questions in order to refine, modify, and expand the model of practice.

Factors Related to Therapists

Just as in many other human science research studies, there are always many confounding factors which could have an effect, either negatively or positively, on the outcome of a study that involves human subjects. In this study, the group of research therapists could be considered as a separate variable with many different confounding factors. These factors could be related to the therapists' years of clinical experience, their style of working, the level of post-graduate training in different treatment methods, and also their theoretical orientation in clinical work. The 3-day training course attended by all the research therapists might help to remove some of these factors. Unavoidably, there were always some factors that could not be controlled in such a small scale study. For further study, it will be important to consider the following questions:-

Would this study have a different outcome if different groups of therapists were involved?

The study could be replicated by using a different group of research therapists who receive the same level of training as the first group. A sample of children with similar demographic and clinical characteristics could be selected for the repeated study. Confounding factors e.g. those related to parents and teachers would have to be controlled. Then, if the results of this replicated study are similar to the first one, one can conclude that the care package is effective in producing changes in the children's behavioural pattern and that the background of the therapist is not a contributing factor.

Would the years of clinical experience and level of post-graduate training of therapists have a different effect on the outcome of the care package?

A comparative study could be conducted by using two groups of therapists with different years of clinical experience and levels of post-graduate training. Both groups of therapists would receive the same level of training in implementing the care package. The results from both groups would then be compared to see whether or not there are differences in the outcomes in relationship to their years of experience and level of post-graduate training.

Factors Related to Children with ADHD

There are many factors pertaining to the uniqueness of each child in his/her diagnosis of ADHD. The question below should be considered in developing the care package and conducting a new efficacy study.

Would the care package have different levels of effectiveness for children with different subtypes of ADHD, different degrees of comorbidity and also different age bands?

As discussed in Chapter Two on Literature Review, because different subtypes of ADHD have different aetiological factors a different treatment strategy may be required. For example, Carlson et al (1999) suggested that the ADHD-Inattentive Type could be considered as a separate disorder as it requires different treatment from the ADHD-Hyperactive-Impulsive Type and the ADHD-Combined Type.

Research data indicated that over 50% of children with ADHD have other comorbid conditions (Brown, 2000). As a result, they will require different forms of treatment for their associated problems. Furthermore, the author's clinical experience highlighted that younger children tend to respond better to treatment than does an 'older' child. In view of this information, different care packages should be developed to cater for children with different subtypes of ADHD, different degrees of comorbidity and of different ages.

Factors Related to Parents of Children with ADHD

As the family is a constant factor in the child's life (Grady, 1989), it is important to consider the effect of parent-child interaction on the child's behaviour and development. In considering parents as one of the confounding variables, one would ask the following question in relationship to the outcome of the care package.

Would the educational level and cultural background of the parents have a different effect on the outcome of the care package?

Although no study can be identified which addresses the above question directly, clinical experience indicated that parents from different cultural background and with different educational level do have different parenting style and expectation. Therapists need to work at the level of the parents and try to engage them in the therapeutic work. Two examples of related research studies have been identified as shedding some light on this issue. Biederman, Milberger, Faraone, Kiely, Guite, Mick, Ablon, Warburton and Reed (1995) conducted a study to investigate the family-environment risk factors for ADHD. They concluded that the impaired development in children with ADHD was associated with an aggregate of adversity factors in the family rather than with one single factor e.g. severe marital discord, low social class, large family size, parental criminality, maternal mental disorder, and foster care placement. A recent study carried out by Christakis, Zimmerman, DiGiuseppe and McCarty (2004) indicated that early television exposure is associated with attentional problem at age 7. This association could be related to

the parenting style and other family factors. It would be useful to investigate these issues further in relationship to the development of care packages for children with ADHD.

Factors Related to Teachers of Children with ADHD

Results of this study indicated that children showed more improvement at home than in school environment. This could be related to the family-centred approach adopted in the care package. However, the inconsistent results in school environment could indicate that there were other confounding factors needing to be considered. These factors could be related to the class size, the ratio of adult to children in the classroom, years of experience of the teacher, and the teaching style of the teacher. For further study, it would be useful to examine the effect of different teaching styles on the behaviour of children with ADHD. The following question could be addressed:-

Would the teaching style of the teacher have different influences on the outcome of the care package?

As children with ADHD spend most of their waking hours in school, input from the child's teacher is important in the overall management programme. In a meta-analysis of 63 classroom intervention studies carried out by DuPaul and Eckert (1997), they concluded that classroom behavioural interventions carried out by teachers have well-documented effects for children with ADHD. The teacher-child interaction is considered to be one of the significant influencing factors of the child's behavioural patterns (DuPaul and Stoner, 2003). Therefore, it is important to investigate the effect of different teaching style on the behavioural outcome of children with ADHD.

Factors Related to the Outcome of the Care Package

There are many different ways to measure the outcome of a therapy programme. One could use different standardised tools to measure the outcomes quantitatively like the MPOC and ADHD Rating Scales-IV used in this study. Another way is to collect feedback and comments from the users by using different qualitative

research methods. Qualitative method like semi-structure interviews can capture information that cannot be collected by using numbers and figures. In order to enrich the processes of collection and analysis of data, researchers start to combine quantitative and qualitative research methods in different research studies (Bryman, 1993). In analysing the factors related to the outcome of the care package, the following questions should be considered in future research:-

Would the effectiveness of the care package have a long-lasting effect after the termination of the service?

So far, no treatment has been identified to 'cure' children with ADHD. Medication treatment has only 70% of success rate (Spencer et al, 1996). Medication is not a long-term solution. It is only a temporary relief of the signs and symptoms. Once the effect of medication subsides, the child will return to his or her original behavioural state. Although the results of this short care package are mostly positive, it is important to investigate whether the improvement made is maintained over time after the termination of treatment. This can be done by repeating the ADHD Rating Scale-IV at 6, 12, and 18 months after the completion of the care package. However, as discussed previously, it may be difficult to measure the child's behavioural status in school, as there are many other confounding factors e.g. changes in staffing and learning environment.

Would a care package of longer duration and more frequent client contacts produce a better outcome?

The belief that the more intensive the input the better the outcome is not always true. It is important to ensure the appropriateness and quality of the intervention provided. The care package used in this study is considered by the author to be the minimal level of input in relationship to staffing, funding and resources of different services involved. As discussed, it is important to strengthen the type of inputs that could be provided to schools. This may help to improve further the overall results.

Would the care package have better effectiveness than other forms of combined treatment for children with ADHD?

The form of combined treatment used in this study is very different from other forms of combined medication and psychological treatment used in different recent research studies. These studies are mostly conducted by medical and psychological professionals (MTA Cooperative Group, 1999; Klein et al, 2004). It would be interesting to compare the short-term and long-term effectiveness of these combined forms of treatment with the one used in this study. Information generated in this comparative study could be useful to clinicians, service users and commissioners of services.

Would children with ADHD perceive improvement in their engagement in different occupations after the completion of the care package?

At the time of conducting this study, there was no suitable child-centred, occupation-based outcome measure which could be identified to measure the child's perception of his / her level of participation in different occupations. Other existing standardised tools are either too expensive, take a long time to administer, or require post-graduate training to become a qualified user. At the end of 2004, the Perceived Efficacy and Goal Setting System (PEGS) (Missiuna, Pollock and Law, 2004) was published. The PEGS is a standardised tool which enables young children, aged between 6 to 9 years old, to self-report how they perceived their level of competency in different functional activities by using picture cards. The PEGS can be useful as one of the outcome measures used in this study. However, the age band of the PEGS does not fit with the age range of children used in this study i.e. 5 to 10 years old. Nevertheless, it is essential to evaluate the child's perception of the effectiveness of the care package by using appropriate child-centred, occupation-based outcome measures.

Factors Related to Other Team Members

A team approach is essential in the processes of evaluation and intervention of children with ADHD. Based on the author's clinical experience, the care package developed can easily be integrated into collaborative practice with child psychiatrists, psychologists, and family therapists. However, it would be useful to

examine the perception of other professionals regarding the role of occupational therapy for children with ADHD. Their response to the following question would be illuminating.

Would other members of the multi-disciplinary team accept the defined roles of occupational therapy in different processes of assessment and treatment of children with ADHD?

The author acknowledges that different services may adopt different clinical pathways and packages of care for children with ADHD. However, In order to promote the acceptance of occupational therapy, the author believes it is important to share practice and promote joint working with other professionals.

Factors Related to the Application of the Model in Different Countries

Obviously, the care package used in this study is appropriate to the unique healthcare, social care and educational systems in the UK. Whether or not the care package would be equally effective in other countries is questionable. Collaborative research effort with occupational therapists from other countries could be established to address the question below:-

Would this model of practice be applicable in other countries with either similar or diverse systems of healthcare, social care and educational programmes?

Although the key concepts of the model can be applied in a generic manner, it is the specific assessment and treatment procedures that need to be adapted and modified for specific environmental demands. The application of the family-centred approach may also need to be modified in the light of certain cultural factors e.g. parenting style and expectation, role of extended family members.

CONCLUSIONS

In order to validate the developed model of practice, a family-centred occupational therapy care package was developed. The care package was based on the principles of a family-centred care approach and also the theoretical and conceptual basis of evaluation and intervention described in Chapter Six. The clinical pathway of the care package lasted for 3 months with a total of 12 weekly contacts with the child, parents and/or teacher. A multi-centred study was carried out to evaluate the process and outcome of the occupational therapy care package for children aged 5 to 10 years. Twenty occupational therapists from the four countries in the UK participated in this study after completion of a 3-day training course on the research protocol. A sample of 20 children with ADHD was involved in the study. Outcome data were collected by using the MPOC-20 and also the ADHD Rating Scales before and after the implementation of the care package.

Results of the ADHD Rating Scales indicated that all except 3 children (i.e. 85%) showed improvement in the scores after treatment. 13 children (65%) had significant changes of scores in at least one of the subscales, and 11 children (55%) showed significant changes of scores in either one or both the total scales in the whole ADHD Rating Scales. The most significant changes of scores were related to the home version of the ADHD Rating Scale. These results were encouraging and comparable to other efficacy studies. However caution should be exercised in generalising the results because of the small sample size, the lack of randomisation, the lack of a control group in the research design and also potential “experimenter effect” on the part of the research therapists.

In the case of the results of the MPOC-20, the mean scores of the five scales were all above 6 except one scale at 5.67, and the median scores were all at or above 6. This indicated that parents experienced a good level of family-centred care delivered by the research therapists who implemented the care package. Traditionally, the educational background and continuing education goals of paediatric occupational therapists have focused on acquiring knowledge and skills for more effective treatment of the child. Therapists have gradually come to

realise that a therapeutic programme developed only to meet the child's needs may be insufficient in the comprehensive treatment of many children with various disabilities, including children with ADHD. Intervention for the child can be fully maximised through the development of a positive working relationship between therapists and parents. Occupational therapists must recognise the vital role of parents in the therapeutic process, must increase their understanding of the parent-child interaction, and expand their skills to include effective collaboration with parents for the benefit of the child.

Further work needs to be done to improve inputs to schools and also to facilitate better teacher-therapist collaboration. The study has built the foundation for the model by examining the effectiveness of a care package. Information generated in this study will be used to refine/modify the structure and content of the care package. However, there are many questions left unanswered. A larger scale randomised control trial should be carried out to evaluate the efficacy of an improved care package with inputs from research therapists and parents.

Chapter Eight

Final Discussion and Conclusions

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Reflections on the Whole Research Process

“As health care professionals, it is incumbent upon us to develop and use more than just our technical skill. We must make decisions and base our actions on many factors, which interact in complex ways. Theoretical grounding, previous experience, client wishes, environmental conditions, research evidence, and resource constraints are but a few of the factors that influence our decision-making. There are very rarely right decisions or actions in our practices; more likely there are best decisions or actions. In our efforts to use best practice, the process of reflection can be a powerful learning tool.”

(Pollock & Rochon, 2002, p.32)

INTRODUCTION

Occupational therapy focuses on assisting individuals with different disability conditions to engage in occupations that they find meaningful and purposeful (American Occupational Therapy Association, 2002). Occupations are the ordinary and familiar things that people engage in throughout their daily lives to occupy their time and give life meaning (Hinojosa and Kramer, 1997). Participation in the everyday occupations of life situations has a positive influence on health and well-being, and is essential for human development (Law, Steinwender and Leclair, 1998; WHO, 2001). The study of occupation as a science (i.e. occupational science) provides occupational therapists with the conceptual foundation for facilitating a better quality of life for their clients (Blanche and Henny-Kohler, 2002).

Children with ADHD have significant impairment in social, academic, or occupational functioning (American Psychiatric Association, 1994). The symptoms of ADHD interfere with the parent-child interaction and disrupt the reliability and predictability of activities of daily life (Segal and Frank, 1998). Children with ADHD frequently shift their attention to different aspects of the environment (Barkley, 1997). As a result, they fail to participate successfully in different learning, daily, play and social activities. Quite often, they tend to play alone, and choose to play with younger children or children with a disability (Leipold and Bundy, 2000). Mailloux et al (1985) stressed that successful engagement in early childhood occupations provides the foundations on which tomorrow's life experiences as an adult will be built. Thus, children with ADHD may not develop their potential because of the lack of opportunities to participate in productive and meaningful activities.

The role of occupational therapy in facilitating an individual's successful participation in different occupations can be broadened to this area of practice. The practice of paediatric occupational therapy for children with ADHD will be guided by the basic understanding of the development of normal skills enabling successful participation in different childhood occupations. The intervention programme produced by a paediatric occupational therapist tends to be multi-

faceted in nature. It will address issues related to the child, the task (occupations) carried out by the child and also the environment in which the task is carried out. The focus of intervention is on enabling parents and their children with ADHD to participate as far as possible in everyday occupations that are meaningful to them given the available resources of the service (Primeau et al, 1990).

This three-stage study was designed to develop an occupational therapy model of practice for children with ADHD. This work was significant as there are no published clinical guidelines to designate the specific roles of occupational therapy in the management of this specific childhood disorder in the UK. With the increase in the demand of evidence-based practice and clients' involvement in their treatment planning, occupational therapists need to demonstrate that their work is based on research evidence and also effective client-therapist partnership in the service delivery. The development of an evidence-based model of practice will provide guidance to therapists about what to assess and how to assess it, and state the goals of treatment with clear intervention strategies.

With clear articulation of specific occupational therapy assessment and treatment procedures, the model will help to define the unique role of occupational therapy for children with ADHD. With these aims in mind, this study set out to develop a delineation model of occupational therapy practice by employing different research methodologies and processes of scientific inquiry throughout the three stages of the study. The result is the development of a family-centred occupational therapy care package for children with ADHD. The emphasis on a family-centred care approach is consistent with the government directive (DoH, 1998 and 2000) to involve clients in the planning and delivering of the care services.

OVERALL VIEW AND KEY FINDINGS OF THE THREE STAGES OF STUDY

Clinical experience and theoretical information are always the starting point for the process of formulating sets of guidelines for practice. In order to establish guidance for practice and the specific role of occupational therapy for children with ADHD, a three-stage study was designed to meet the following objectives outlined at the end of Chapter Two on Literature Review:-

- 1. To carry out an ongoing literature review of the aetiology, theory, assessment and treatment of ADHD, especially in identifying knowledge which could be integrated into occupational therapy practice.*
- 2. To study the components and processes involved in constructing a model of practice.*
- 3. To carry out a national survey research in order to explore the current practice of occupational therapists in the assessment and treatment of children with ADHD and also to identify training needs.*
- 4. To develop a preliminary model of practice based on research evidence, the author's clinical experience and also information gathered through the national survey.*
- 5. To achieve consensus on the components of the preliminary model of practice through a clinical forum in order to develop the role of occupational therapy for children with ADHD.*
- 6. To refine the preliminary model of practice based on the results of the consensus development. A family-centred occupational therapy care package will be formulated with a written protocol of evaluation and intervention for children with ADHD.*
- 7. To conduct a multi-centred efficacy study to validate the formulated care package based on the developed model of practice. Research methods on process and outcome evaluation will be used to measure the efficacy of a family-centred occupational therapy care package for children with ADHD.*

Different stages of the study addressed different objectives. **Stage one** explored the current practice of paediatric occupational therapy in the UK by conducting a **national survey**. Results indicated that only 8.5% of therapists who responded to the survey had involvement in a designated service for children with ADHD. 27% indicated that they did not see children with ADHD. 63.8% of therapists did see children with ADHD as part of their overall caseload in a community service, but mainly because of the children's associated problems in different sensory, perceptual, motor and functional performance. 20.7% indicated that lack of knowledge and skill could contribute to non-involvement in the assessment and treatment of children with ADHD. Other reasons for non-involvement in a designated service ranged from limitations in the criteria of referral, resources and scope of the services. These results suggested that occupational therapy for children with ADHD is a small field of practice.

Through the national survey, it was possible to identify therapists' existing levels and gaps in knowledge, along with the preferred modes of training. There were a total of 46.8% who stated that their levels of knowledge and skills were basic or poor. Over half the total sample highlighted gaps in their knowledge in the areas of evaluation, specific assessment and treatment procedures, evidence-based practice, goal setting and documentation. The top two preferred modes of training were specific occupational therapy clinical workshops and multidisciplinary seminars/study days.

Results generated through this national survey provided useful information about the current practice of occupational therapy for children with ADHD. They also highlighted the learning needs of occupational therapists who work with or intend to work with children with ADHD. Therapists need to acquire up-to-date knowledge about the clinical features, diagnostic criteria, etiology and contemporary theories of ADHD in order to make significant contributions in the overall management of children with ADHD. Consequently, the development of an evidence-based occupational therapy model of practice is necessary in order to provide therapists with guidance in the processes of evaluation and intervention. Such a model will help to unify practice and also develop recognition of the unique contributions that could be made by occupational therapists.

Stage two involved the **consensus development** on the role of occupational therapy for children with ADHD by using a consensus development research method, based on the conceptual model developed by Murphy et al (1998), with occupational therapists working in the paediatric field. The method consisted of 3 stages i.e. inputs, process and outputs (see Figure 5.1 in Chapter Five). 72 paediatric occupational therapists participated in one of three clinical fora in London and Scotland i.e. 24 therapists per each forum. The aim was to establish consensus agreement on statements regarding the role of occupational therapy for children with ADHD. The statements were developed according to current research evidence and the author's clinical experience. A high level of consensus was established in the areas of team approach, evaluation and diagnosis, assessment procedures, multi-faceted intervention, education and training, and research. In order to identify the key role of occupational therapists in the processes of assessment and treatment, participants were asked to select the top six priorities of assessment and the top five priorities of treatment for children with ADHD. As stated, the author's decision to limit the number of priorities of assessment to six and the priorities of treatment to five, was taken in the light of the time and resources available. The top six priorities of assessment identified were: Perceptual-Motor and Functional Skills (98.6%), Neurological Basis of ADHD (97.2%), School Factors (94.4%), Psychosocial Skills (73.6%), Behavioural Patterns of ADHD (66.7%), and Psychological Basis of ADHD (55.6%). The top five priorities of intervention identified were: Environmental Adaptation (95.8%), Remediation of Sensory Integrative Dysfunction as a basis for ADHD (94.4%), Remediation of Developmental and Functional Problems (93.1%), Parental Education and Training (81.9 %), and Educational Management (61.1%).

The qualitative data highlighted that there were clear differences in the practice between paediatric occupational therapists working in child health settings and occupational therapists working in CAMHS settings. The integration of skills in these two practice areas is important in order to develop a holistic approach when supporting children with ADHD. A clinical forum could be established in the future to facilitate the integration of skills in these two practice areas. Results

generated through this consensus development research were useful for developing and shaping a realistic occupational therapy model of practice for children with ADHD.

An occupational therapy delineation model of practice was developed by integrating information from the literature review, the author's clinical experience, and data generated from the research on consensus development. A delineation model identifies intervention principles for specific groups of clients and can be conceptualised within a broader professional model which emphasises the concept of occupation for health (Kortman, 1994). The model illustrates the interaction between the child, the task to be carried out by the child, and also the environment in which the child carries out the task. In order to achieve a successful functional outcome, the goodness-of-fit amongst all these three factors needs to be achieved. The model also highlights a new understanding of ADHD as complex, multifaceted clusters of dimensional impairments in neurological, psychological, and behavioural levels. In order to identify the "roots" of the disorder and also remediate multiple dysfunctions, a multi-dimensional model of evaluation and multi-faceted model of intervention are proposed. The author proposed that the model of practice should be implemented within a framework of a family-centred care approach, since empowering and enabling parents are effective strategies if changes are to be made in the child's behavioural patterns. Further research studies were needed to validate the proposed roles and refine the developing model of practice.

The **third and final stage** evaluated the process and outcome of a family-centred occupational therapy care package for children aged 5 to 10 years by conducting a **multi-centred efficacy study**. The clinical pathway of the care package lasted for 3 months with a total of 12 weekly contacts with the child, parents and/or teacher. Twenty occupational therapists from the four countries in the UK participated in this study after completion of a 3-day training course on the research protocol. A sample of 20 children with ADHD was involved in the study. Outcome data were collected by using the MPOC-20 and also the ADHD Rating Scales before and after the implementation of the care package.

Results of the ADHD Rating Scales indicated that all except 3 children (i.e. 85%) showed improvement in the scores after treatment. 13 children (65%) had significant changes of scores in at least one of the subscales, and 11 children (55%) showed significant changes of scores in either one or both the total scales in the whole ADHD Rating Scales. The most significant changes of scores were related to the home version of the ADHD Rating Scale. These results were encouraging and comparable to other efficacy studies. However, caution should be exercised in generalising the results because of the small sample size, the lack of randomisation, the lack of a control group in the research design and also potential “experimenter effect” on the part of the research therapists.

In the case of the results of the MPOC-20, the mean scores of the five scales were all above 6 except one scale at 5.67, and the median scores were all at or above 6. This indicated that parents experienced a good level of family-centred care delivered by the research therapists who implemented the care package. Results of this multi-centred study offered some validation of the model of practice, albeit with a relatively small sample. The whole study makes a significant contribution to occupational therapy knowledge by creating a new delineation model of practice for which the research undertaken offers some validation. This study helps to define the unique role of occupational therapy for children with ADHD.

REFLECTIONS ON AND CRITICAL EVALUATION OF THE WHOLE RESEARCH PROCESS

Although it is hoped that a great deal has been achieved through this study, there are many more aspects which could be learnt and done differently. As stated by Pollock & Rochon (2002), the process of reflection can be a powerful learning tool. The author’s personal reflections on and critical evaluation of the whole research process are presented in the following sub-sections:

Reflections on and Critical Evaluation of the Process of Conducting the Survey Research

The survey research study was the first one to be conducted in the UK. It provided knowledge about the current situation in which occupational therapy for children

with ADHD is a small field of clinical practice. It highlighted the need to develop a systematic model of practice by integrating current research evidence, the author's clinical experience, and also empirical data generated from subsequent stages of research.

The author acknowledged that the initial planning of the survey design and survey questions was extremely important in conducting survey research. It was recognised that once surveying had begun, it was difficult or impossible to adjust the basic research questions under consideration since the instrument must remain stable in order to standardise the data set. The author piloted a drafted sample of the survey form before distributing the final draft for the actual study. This helped to improve the quality of the questionnaire and thereby the data collected. However, it was recognised that conducting the survey immediately after a major holiday break could cause a lower rate of returns, if therapists were busy with their routine work. It was felt that the provision of a stamped address envelope might help to obtain a higher number of questionnaires being returned, but that has financial implications for a large sample size.

In order to obtain a fuller picture with valid, reliable and generalisable data, a bigger scale study could be carried out to include all occupational therapists working in CAMHS as well as practising therapists who are not members of NAPOT. It is also important to improve the construction of the questionnaire by adding more specific questions, e.g. questions which explore the therapists' involvement in the areas of multi-faceted intervention. The employment of semi-structure interview techniques could be useful for gathering ideas and opinions of therapists, which could not be captured by the questionnaire.

Reflections on and Critical Evaluation of the Process of Conducting the

Consensus Development Research

In order to identify an appropriate research methodology, the author reviewed different consensus development methods i.e. the Focus Group Method, the Delphi Method, the Nominal Group Technique, and the Consensus Development Conference Method. This has widened the knowledge base of the author regarding

these forms of research methods. As there was not an identifiable group of expert therapists who could contribute to the consensus development, some of these methods could not be used in their standard or pure form. The lack of research evidence to support the role of occupational therapy for children with ADHD and other constraint factors in time and finance also affected the application of these methods. As a result a structure of consensus development method based on the 3-stage conceptual model developed by Murphy et al (1998) was adopted in this study. The rationale in selecting the procedures in the consensus development method was discussed in detail in Chapter Five. The study produced a high degree of agreement in different role statements within different areas of practice. It captured collective knowledge and made the optimum use of available information. The results of the study provided a very strong foundation for defining the role of occupational therapy for children with ADHD, which was an integral part of the model of practice.

Although the consensus development method used in this study is different from those standard methods, it served as a stepping stone to define the role of occupational therapy for children with ADHD by achieving agreement on role statements which were based on research evidence and the author's clinical experience. As a learning point on research methodology, it would be interesting to know whether or not different results might be produced if different consensus development methods were used, e.g. the Delphi Method. As there could be an issue related to the transference of the author's opinions to the participants, a follow-up survey could be conducted with the same group of therapists to see whether or not they still hold the same opinions on the role of occupational therapy as previously agreed.

As stated, the output from a consensus development method is rarely an end in itself. It is only the beginning of a developmental process. Therefore, it is important to chart the ongoing progress of the developed model of practice in terms of further refinement of the care package, the clinical application of the model in the field, and also its acceptability by occupational therapists and other multi-disciplinary team members. As a team of experienced occupational

therapists (those involved in the multi-centred study) is now available in the field, further consensus development research could be done by using the method of Consensus Development Conference.

Reflections on and Critical Evaluation of the Process of Developing the Model of Practice

It is vitally important that the organisation of occupational therapy knowledge in the form of a model of practice clearly supports the integration of basic and applied science. Basic research examines the model's theoretical arguments about organisation and dysfunction. Applied research tests arguments about the usefulness of clinical applications. The two types of research are complementary, and both are necessary. A model of practice integrates basic and applied science into a single conceptual structure, which also supports strategies of therapeutic intervention (Kielhofner, 1992).

The author successfully achieved this goal by developing a delineation model of occupational therapy practice for children with ADHD. The model discussed the importance of the child, the environment, the task and the interaction among these key factors as a means of understanding performance and difficulties with performance identified in children with ADHD. It was based on the essential components identified in different major Professional Models developed within the profession e.g. the Occupational Adaptation Model (Schkade & Schultz, 1992), the Ecology of Human Performance Model (Dunn et al, 1994), the Model of Human Occupation (Kielhofner, 1995), and the Person-Environment-Occupation Model (Law et al, 1996).

The development of the delineation model also met the progression of model development predicted by Kielhofner over twelve years ago. He predicted that further directions for model development might involve (Kielhofner, 1992):-

1. The interface between therapist and client.

The family-centred care approach was adopted in the model, which emphasises the interaction between therapist, parents, teachers and the child.

2. *Clinical reasoning about the whole treatment processes.*

In the model, guidance was provided to facilitate therapists' clinical reasoning about how they use theory, how they reason through interactions with clients, and how they mentally construct an understanding of the immediate and ongoing therapeutic process.

3. *The logistics of service delivery.*

A clear clinical pathway was outlined in the family-centred occupational therapy care package for children with ADHD, aged between 5 to 10 years old.

Reflections on and Critical Evaluation of the Process of Conducting the Multi-Centred Outcome Study

A model of practice provides a context for both applied and basic research. Research allows empirical scrutiny of the practice model, and also tests the effectiveness of the technology for application based on the theory. Applications in practice can provide critical feedback leading to changes and elaboration of the theory (Kielhofner, 1992). This dynamic process of input from the interdisciplinary base together with the feedback loops from practice and research are necessary to keep a model vital (see Figure 1.1, p.7).

The formulated delineation model needed to be validated through applied research, clinical practice and efficacy studies. A multi-centred study was carried out to evaluate the process and outcome of a family-centred occupational therapy care package which was based on the concepts of the model. These sorts of scientific studies test the accuracy of the theoretical arguments as they relate to the phenomena which they seek to explain. The development of the care package was based on the integration of research evidence identified from the extensive literature review, the author's clinical experience and also data generated from different stages of the research study. It highlighted the fact that experience in clinical practice guides research and, in turn, research results modify clinical practice. The theoretical and empirical work done within the model can make contributions to the interdisciplinary areas from which the model's underlying concepts came (Kielhofner, 1992).

Most research therapists found the 3-day training course on the research protocol helpful and informative. It will, however, be useful to gather further comments from them in order to improve the content and methods of presentation of the course materials. In view of the complexity of the materials, it may be necessary in the future to extend the course to 5 days so that examples of case studies could be included in order to facilitate the application of the information in clinical practice. As stated, the self-assessment version of the MPOC for service providers (MPOC-SP) (Woodside et al, 2001) should be incorporated into the training course to further promote a family-centred care approach among occupational therapists.

One important lesson learned from this study concerned the problems associated with the lengthy and confusing processes in obtaining ethical approval at both the national and local level. The main problem is related to the lack of unified procedures in granting approval for multi-centred study at the local level in different areas. This caused considerable delay for a number of local researchers in the implementation of the care packages. This imposed constraints in terms of the time scale of a higher degree study.

Although the efficacy of the care packages has been demonstrated in most of the case studies, further work needs to be carried out in order to identify the best combination of different treatment components and also the long-term effect of the care package. It was proposed that a larger scale randomised control trial should be carried out to evaluate the efficacy of an improved care package. Other influencing factors will need to be considered as well. These include the duration of the care package, the years of clinical experience of the therapists, the range of post-graduate training completed, the educational level and cultural background of the parents, and factors associated with school and teachers, e.g. support from head teacher, teaching style. Although a lot more still needs to be done, the developed care package helps to define the specific role of occupational therapy in the management of children with ADHD. It serves as a stepping stone to unify occupational therapy practice in the evaluation and intervention of this specific developmental disorder.

The Importance of Family-Centred Care Approach in Occupational Therapy Practice

The term 'family-centred care' is not new to occupational therapists who work with infants and children. In the past decade, occupational therapists have been encouraged to assume this framework for practice. Although the profession has grown in the understanding of and practice in family-centred care, DeGrace (2003) suggested that occupational therapists need to identify exactly what it means to provide family-centred care. She further stated that the true nature of family-centred care has yet to be captured and practised. In order to promote good understanding and the application of family-centred care approach in practice, a session was scheduled in the 3-day training course to disseminate current information and the philosophy of the approach. The use of the MPOC-20 as one of the outcome measures also reinforced the practice of family-centred care in the research protocol.

Family-centred care approach emphasises the provision of occupational therapy services for the child in collaboration with the child's primary caregivers, whether they are parents, grandparents, baby-sitters, or teachers. It demonstrated in the multi-centred study that a family-centred care approach made a significant contribution to the parents' confidence in managing their children with ADHD. Most of the parents participating in the study felt empowered and enabled by the approach adopted by the research therapists. The results are consistent with current evidence that a family-centred approach to service delivery is considered to be one of the best practices in early intervention services (Bailey, Buysse, Edmondson and Smith, 1992). This also echoes recent research evidence that a family-centred approach results in greater parental satisfaction with services, better parental psychosocial well-being, and better psychological adjustment of children (King, King, Rosenbaum and Goffin, 1999).

CONTRIBUTIONS TO KNOWLEDGE

Information that places occupational therapy in the forefront will promote the status of the profession (Kielhofner, 1992). Occupational therapists need to have ready access to contemporary professional information which is evidence-based and applicable in clinical practice. Such professional knowledge will provide resources to respond to the changing service delivery system in which occupational therapists practise (Pollock and Rochon, 2002). However, professional information does not come about without the effort to establish the knowledge through scientific research. In this study, the author has made a contribution of new knowledge by creating an occupational therapy delineation model of practice for children with ADHD.

The most obvious difficulty confronting the development of a model of practice is the lack of knowledge about the processes involved. The author integrated information from different sources in the occupational therapy literature to develop a process map for developing a delineation model of practice (see Figure 1.1 in Chapter One). The first phase of formulating a model of practice is development, which involves the applied Type I Inquiry, using theoretical information to formulate guidelines for action. In this phase, the nature of the problem is elucidated, the elements of the problem clarified, and the possible means of problem resolution outlined. The second phase involves Type II Inquiry, namely the use of methods of science and research designs to answer specific practical questions. In this phase, the concern is to refine and assess the adequacy of sets of guidelines for practice. Attention is given to such issues as reliability and validity of problem identification, specificity of the guidelines for problem resolution, safety, and effectiveness (Mosey, 1992). This basic body of knowledge provided other researchers with a simple tool to embark on similar projects for developing a delineation model of practice for other care groups.

Results of the national survey conducted in stage one of the study provided useful information about the current practice of occupational therapy for children with ADHD. These results highlighted that occupational therapy for children with ADHD is a small field of practice. The role of occupational therapy in facilitating

engagement in meaningful tasks and successful participation in different occupations can be broadened to this new area of practice. The results of the national survey provided the background for this timely and important change.

The consensus development study conducted in stage two provided a good example of the use of consensus development research methods in achieving agreement on a new area of practice. The study contributed further examples concerning the application of this specific research methodology in the area of healthcare studies. Results of the consensus development research provided a high level of agreement in the areas of assessment and treatment relating to occupational therapy practice for children with ADHD. This in turn helped to set out the scope of practice and define the specific roles of occupational therapy for children with ADHD.

The whole study makes a significant contribution to occupational therapy knowledge by creating a new delineation model of practice for which the research undertaken offers some validation. This study helps to define the unique role of occupational therapy for children with ADHD. As the model develops, its technology for clinical application can be constantly expanded and refined. Theorists and practitioners can create clinical assessments, accumulate case examples, write guidelines or protocols for application, and develop intervention programmes based on the model. Dissemination of these clinical applications in journals, textbooks, and presentations will make the model more useful in clinical practice. Similarly, problems and insights encountered in practice may lead to changes in the model (Kielhofner, 1992).

This study also has implications for the approach in service delivery. The results of the multi-centred study highlighted that family-centred care approach has a direct impact on the successful outcomes in the management of children with ADHD. Educational programmes for occupational therapists should include training about the family-centred care approach, which is of the essence in effective service delivery for all client groups.

Overall, the study confirms the important role of occupational therapy in assisting families and children with ADHD to engage in meaningful and purposeful occupations in different life situations. Successful participation in occupation facilitates the adaptive process in early childhood development and provides the bases for the emergence, refinement, and eventual maintenance of skills necessary to function independently in society (Wood, 1996; Kellegrew, 1998). The results of the efficacy study justify the significant role of occupational therapy for the health and well-being of children with ADHD, and differentiate occupational therapy from other disciplines.

RECOMMENDATIONS FOR FUTURE RESEARCH

The number and relevance of applications that the practice model offers determine how widely it is adopted in the field, but only empirical support for the model will ensure its survival (Kielhofner, 1992). Therapists understandably concern themselves with how readily a practice model will provide them useful guidelines for application. It is important to note that the search for suitable theories and empirical data is detective work – one seeks clues and pieces together bits of information. It is a tedious, often time-consuming task, but one that may prove very rewarding (Mosey, 1992). This study should be viewed as a significant initial step in an ongoing development of a delineation model of occupational therapy practice for children with ADHD. As the first study of its kind, it has built the foundation for the model, but many questions are left unanswered. All the following questions have been discussed in detail in Chapter Seven. Future research should focus on answering some of these questions in order to refine, modify, and expand the model of practice.

Would any or all of the stages of this study have a different outcome if different groups of therapists were involved?

Would the years of clinical experience and level of post-graduate training of therapists have a different effect on the outcome of the care package?

Would the care package have different levels of effectiveness for children with different subtypes of ADHD, different degrees of comorbidity and also different age bands?

Would the educational level and cultural background of the parents have a different effect on the outcome of the care package?

Would the teaching style of the teacher have different influences on the outcome of the care package?

Would the effectiveness of the care package have a long-lasting effect after the termination of the service?

Would a care package of longer duration and more frequent client contacts produce a better outcome?

Would the care package have better effectiveness than other forms of combined treatment for children with ADHD?

Would children with ADHD perceive improvement in their engagement in different occupations after the completion of the care package?

Would other members of the multi-disciplinary team accept the defined roles of occupational therapy in different processes of assessment and treatment of children with ADHD?

Would this model of practice be applicable in other countries with either similar or diverse systems of healthcare, social care and educational programmes?

CONCLUSIONS

This three-stage study led to the successful development of a delineation model of occupational therapy for children with ADHD. This work was required to facilitate the development of the specific roles of occupational therapy for children with ADHD in order to meet the increase in the demand for evidence-based practice and client-therapist collaboration introduced by the government. The three stages of study were outlined in Chapter Three and the results of each study were discussed thoroughly in the subsequent chapters. A delineation model of practice was formulated by integrating evidence from the extensive literature review, the author's clinical experience, and also data gathered through different stages of research outlined in this study. The validation and application of the model was supported by conducting a multi-centred study to evaluate the process and outcome of a family-centred occupational therapy care package for children with ADHD aged between 5 to 10 years old for a period of 3 months. The findings of the multi-centred study provided initial evidence about the efficacy of occupational therapy inputs and also highlighted the importance of delivering service based on a family-centred care approach.

It is hoped that the study makes a significant contribution to occupational therapy knowledge and has implications for practice, research and education. Although the theoretical development of occupational therapy assessment and treatment procedures is still embryonic, it has high potential for clinical application. Several recommendations arising from the study provide opportunities for and recognise the importance of carrying this work forward. Further theoretical clarification, expansions of the model, and discourses with interdisciplinary knowledge are among the factors needed to augment the current model. Since a model of practice represents the most dynamic arena of knowledge development in the field, constant change is always to be expected and valued.

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Appendix A:

DSM-IV Diagnostic Criteria for Attention Deficit Hyperactivity Disorder (ADHD)

A. Either (1) or (2):

- (1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level.

Inattention

- (a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
- (b) often has difficulty sustaining attention in tasks or play activities
- (c) often does not seem to listen when spoken to directly
- (d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)
- (e) often has difficulty organising tasks and activities
- (f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
- (g) often loses things necessary for tasks or activities (e.g. toys, school assignments, pencils, books, or tools)
- (h) is often easily distracted by extraneous stimuli
- (i) is often forgetful in daily activities

- (2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with development level:

Hyperactivity

- (a) often fidgets with hands or feet or squirms in seat
- (b) often leaves seat in classroom or in other situations in which remaining seated is expected
- (c) often runs about or climbs excessively in situations in which it is appropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
- (d) often has difficulty paying or engaging in leisure activities quietly
- (e) often "on the go" or often acts as if "driven by a motor"
- (f) often talks excessively

Impulsivity

- (g) often blurts out answers before questions have been completed
- (h) often has difficulty awaiting turn
- (i) often interrupts or intrudes on others (e.g. butts into conversations or games)

- B. Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
- C. Some impairment from the symptoms is present in two or more settings (e.g. at school (or work) and at home).
- D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
- E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Code based on type:

- 1) **Attention-Deficit/Hyperactivity Disorder, Combined Type:** if both Criteria A1 and A2 are met for the past 6 months
- 2) **Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type:** if Criterion A1 is met but Criterion A2 is not met for the past 6 months
- 3) **Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type:** if Criterion A2 is met but Criterion A1 is not met for the past 6 months

Attention-Deficit/Hyperactivity Disorder Not Otherwise Specified (NOS)

This category is for disorders with prominent symptoms of inattention and hyperactivity-impulsivity that do not meet criteria for Attention-Deficit/Hyperactivity Disorder.

Appendix B: Survey Form

Page 1

**NATIONAL SURVEY ON
OCCUPATIONAL THERAPY FOR
CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)**

This survey aims at exploring the current practice of Paediatric Occupational Therapists in the assessment and treatment of children with ADHD, their perceived level of knowledge and training needs. Please answer all relevant questions and return the questionnaire in the envelope provided before 15th March, 2001.

PART I – DEMOGRAPHIC DATA OF THE THERAPIST

1. Please indicate your gender Male Female
2. Would you please provide information about your Occupational Therapy training and other qualifications

Occupational Therapy training:

- Type of Training Courses: Full-time Part-time
- Diploma 3-year Degree 4-year Degree
- 2-year acceleration course Others _____
- Name of O.T. School: _____
- Date of Completion: _____

Other academic qualifications (e.g. other certificate, diploma, or degree etc):-

3. How many years of Occupational Therapy experience do you have?
- Total years of experience in all O.T. clinical areas: _____
 - In paediatric O.T. ONLY: _____
4. Please indicate your current grade / position:
- Basic Grade Senior II Senior I
 - Clinical Specialist (Head III) Head IV/III/II/I. Please indicate: _____
 - Others, please specify _____

5. Please indicate your current area of work (please tick the most relevant box):

- Community Child Health Services, with a wide range of disability conditions
- Acute Hospital, primarily inpatient input
- Acute Hospital and Community Child Health Services
- Child & Adolescent Mental Health Services
- Social Services
- Specific Services, e.g. Learning Disabilities. Please specify _____
- Others, please specify _____

6. Please indicate your hours of work per week.

- Full-time, i.e. about 36 hours / week Part-time, i.e. _____ hours / week

PART II : DESCRIPTION OF CLINICAL WORK

7. Please indicate your current caseload in terms of conditions and percentage.

<u>Conditions</u>	<u>Percentage</u>
<input type="checkbox"/> Physical Disabilities, e.g. cerebral palsy, spina bifida, muscular dystrophy, etc.	_____
<input type="checkbox"/> Acquired Neurological Conditions, e.g. traumatic head injury, childhood stroke, etc.	_____
<input type="checkbox"/> Learning Disabilities, e.g. mild, moderate, severe, profound-multiple handicaps, etc.	_____
<input type="checkbox"/> General Developmental Delay	_____
<input type="checkbox"/> Specific Developmental Disorders, e.g. Sensory Integrative Dysfunction, Developmental Co-ordination Disorder, etc.	_____
<input type="checkbox"/> Autistic Spectrum Disorders / Asperger's Syndrome	_____
<input type="checkbox"/> Neonatological Problems, e.g. pre-term babies	_____
<input type="checkbox"/> Orthopaedic Conditions	_____
<input type="checkbox"/> Childhood Mental Health Problems, e.g. Eating Disorder, Conduct Disorder, ADHD, etc.	_____
<input type="checkbox"/> Others, please specify _____	_____
	Total: 100%

8. Please indicate the nature and level of your involvement in the diagnosis and treatment of children with ADHD.

- I have active input in a multidisciplinary team /service designated for children with ADHD. (Please read the next statements before ticking this box, and then go to Question 9).
- Although I am not involved in a designated service for children with ADHD, I do see children with the diagnosis or feature of ADHD as part of my overall clinical work. (Please go to Question 10).
- No, I am not involved in a designated service for children with ADHD. (Please go to Question 10).

9. If you have active input in a multidisciplinary team / service for children with ADHD, please state the nature of your input (tick as many as apply):

- I am involved in the initial screening of children who are suspected of having ADHD referred to the team/service.
- I contribute to the process of confirming the diagnosis, making differential diagnosis (i.e. identifying conditions which mimic ADHD) and identifying comorbidity (i.e. conditions which coexist with ADHD).
- I am involved in a multi-faceted intervention programme for children with ADHD, e.g. the use and monitoring of medication, behavioural management, parent education and classroom management.
- I participate in the education of the general public and other professionals involved in children with ADHD e.g. through seminars or talks.
- I participate in research studies on ADHD.

Please note that more detailed information on the Occupational Therapy evaluation and intervention processes will be gathered at the next stage of research.

10. **If you do not have active involvement in the diagnosis and treatment of children with ADHD within a multidisciplinary team, please tick the reasons (tick as many as apply):**

- It is not within the scope of the service.
- Children with ADHD do not fulfil the criteria of referral of the service.
- The resource of the service is mainly allocated to children with other conditions, e.g. physical disabilities. Therefore, it is not possible to extend the service to children with ADHD.
- I do not have the necessary knowledge and skills in the field of ADHD.
- Children with ADHD have not been referred to Occupational Therapy as it is not recognised that an Occupational Therapist has a role to play.
- Children with features of ADHD are generally referred because they present different sensory, perceptual, motor and functional difficulties that need Occupational Therapy input. They will be seen as part of the overall referrals.

PART III: ACQUISITION OF KNOWLEDGE IN THE TREATMENT OF ADHD

11. **Would you please rate your level of knowledge and clinical skills in evaluating and treating children with ADHD.**

- High Level Good Average Basic Level Poor

12. **Which of the following, if any, has contributed to your existing knowledge of ADHD.**

- Occupational Therapy Education (Under-graduate i.e. BSc)
- Occupational Therapy Education (Post-graduate i.e. MSc)
- Study Day
- Conference
- Occupational Therapy Workshop
- Self-Study e.g. books, journals
- Occupational Therapy Colleagues
- Other Colleagues in the MDT
- Other postgraduate education e.g. certificate, diploma, degree etc
Please specify _____
- Other, please specify _____

13. If there are gaps in your knowledge and skills, please indicate the areas of information you need to acquire (tick as many as apply).

- The clinical features and diagnostic criteria of ADHD.
- Evaluation of ADHD through a team-based approach.
- Specific Occupational Therapy assessment procedures, including the use of Standardised tests.
- Knowledge of the multi-faceted intervention of ADHD, e.g. knowledge of the prescription and monitoring of medication, behavioural management, attention training, etc.
- Specific Occupational Therapy treatment strategies and approaches, e.g. Sensory Integrative Therapy, developmental therapy, functional skill training etc.
- Information on evidence-based practice and clinical guidelines in the diagnosis and treatment of ADHD.
- Goal setting and documentation pertaining to the specific needs of children with ADHD.

14. Please prioritise your preferred modes of acquiring the information indicated above. Rate the following options from 1 to 5, with 1 indicating the most favourable option and 5 the least preferred option.

- _____ Specific Occupational Therapy Clinical Workshops
- _____ Multidisciplinary Seminar / Study Day
- _____ Through journal articles, books and other publications on ADHD, especially those written by Occupational Therapists
- _____ Structured Mentoring Programme through clinical placement in a specific service setting
- _____ Attend National / International Conference on ADHD.

15. Please use the space below to add any further comments.

THANK YOU – Please return questionnaire in the envelope provided

CONSENSUS ON THE ROLE OF OCCUPATIONAL THERAPY FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)

In order to establish consensus on the role of occupational therapy for children with ADHD as a basis for developing clinical guidelines, opinions from practising occupational therapists will be collated through this consensus form. Would you please read the three pre-forum articles provided and then rate the following statements under the column "For the First Round Rating". For sections C & D, please list out the specified number of important items pertaining to occupational therapy assessment and treatment of children with ADHD. Second round of rating will be conducted after a formal presentation and discussion at the ADHD Forum.

For Rating: Please circle 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree

SECTION A: THE TEAM APPROACH

	<u>For the First Round Rating</u>					<u>For the Second Round Rating</u>				
1. Occupational therapist should be an active member of a team or service for children with ADHD.	1	2	3	4	5	1	2	3	4	5
2. Occupational therapist could work as a generic worker or a specialist within a team for children with ADHD.	1	2	3	4	5	1	2	3	4	5
3. Occupational therapist should be involved in the initial screening of children with ADHD.	1	2	3	4	5	1	2	3	4	5
4. Occupational therapist should be involved in the multi-dimensional evaluation of children with ADHD.	1	2	3	4	5	1	2	3	4	5
5. Occupational therapist should be involved in the multi-faceted intervention programme for children with ADHD.	1	2	3	4	5	1	2	3	4	5
6. Occupational therapist should be involved in research on children with ADHD.	1	2	3	4	5	1	2	3	4	5

For Rating: Please circle 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree

SECTION B: EVALUATION AND DIAGNOSIS

For the First Round Rating For the Second Round Rating

- | | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Occupational therapist should be familiar with the DSM-IV and ICD-10 diagnostic criteria on ADHD and Hyperkinetic Disorder. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. | Occupational therapy evaluation can help to confirm or refute the diagnosis of ADHD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. | Occupational therapy evaluation can help to make differential diagnosis i.e. differentiate conditions that mimic ADHD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4. | Occupational therapy evaluation can help to identify the three subtypes of ADHD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 5. | Occupational therapy evaluation can help to identify comorbid conditions and associated problems e.g. DCD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 6. | Occupational therapy evaluation can help to identify the underlying reasons for hyperactivity, inattentiveness and impulsivity. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 7. | Occupational therapy evaluation can help to ascertain the child's level of abilities in different functional skills e.g. handwriting. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

For Rating: Please circle 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree

SECTION C: ASSESSMENT AREAS

Occupational therapist should be involved in the following areas of assessment:-

For the First Round Rating For the Second Round Rating

1. Family structure and home environment, including relationship and interactions between different family members.	1	2	3	4	5	1	2	3	4	5
2. Parenting skills. Parental expectation, attitudes and understanding.	1	2	3	4	5	1	2	3	4	5
3. Birth, developmental, medical history and incidence of significant life events e.g. bereavement.	1	2	3	4	5	1	2	3	4	5
4. Social and cultural factors e.g. ethnicity, belief, and spirituality.	1	2	3	4	5	1	2	3	4	5
5. School factors e.g. teaching style, classroom management and size.	1	2	3	4	5	1	2	3	4	5
6. Neurological basis of ADHD e.g. sensory processing function.	1	2	3	4	5	1	2	3	4	5
7. Psychological Basis of ADHD e.g. attention control and executive functions.	1	2	3	4	5	1	2	3	4	5
8. Behavioural pattern of ADHD i.e. hyperactivity, inattentiveness and impulsivity.	1	2	3	4	5	1	2	3	4	5
9. Perceptual-motor and functional skills e.g. visual perception, motor coordination, self-care skills, handwriting skills.	1	2	3	4	5	1	2	3	4	5
10. Psychosocial skills e.g. emotional state, level of self-esteem, peer-group relationship.	1	2	3	4	5	1	2	3	4	5
11. Learning abilities and communication skills.	1	2	3	4	5	1	2	3	4	5

<p>For the above areas of assessment, please list the top six areas that you think occupational therapists should be involved.</p> <p>Identify each area of assessment by its number in the list above e.g. put 8 for behavioural pattern of ADHD.</p>	1.	4.	1.	4.
	2.	5.	2.	5.
	3.	6.	3.	6.

For Rating: Please circle 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree

SECTION D: MULTI-FACETED INTERVENTION

For the First Round Rating For the Second Round Rating

Occupational therapist should be involved in the following aspects of the multi-faceted intervention programme for children with ADHD:-

- | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|
| 1. Parental education and training. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. Environmental adaptation. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. Behavioural and psychological management. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4. Medication treatment – contribute to the decision making on prescription, provide information to parents, monitor side-effects. Educational management. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 6. Social skill training. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 7. Remediation of sensory integrative dysfunction as a basis for ADHD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 8. Remediation of developmental and functional problems. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

<p>For the above areas of intervention, please list the top five areas that you think occupational therapists should be involved.</p> <p>Identify each area of intervention by its number in the list above e.g. put 6 for social skill training.</p>	<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p>	<p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p>
---	---	---

For Rating: Please circle 1 = Strongly Disagree 2 = Disagree 3 = Neither Disagree nor Agree 4 = Agree 5 = Strongly Agree

SECTION E: EDUCATION AND TRAINING

For the First Round Rating For the Second Round Rating

Occupational therapist should be involved in disseminating information on ADHD to the following groups of people:-

- | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. General public, parents and school staff. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. Health professional groups. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. Senior managers and commissioners of services. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

SECTION F: RESEARCH

Occupational therapist should be involved in research in order to:-

- | | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|---|
| 1. Validate the theory and construct of ADHD. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 2. Delineate different phenotypes and comorbid conditions. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 3. Develop guidelines for making differential diagnosis. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 4. Develop valid and reliable evaluation tools. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 5. Evaluate the efficacy of different treatment methods. | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |

Thank you very much. Please write additional comments on issues not being covered in this form:-

Appendix D:

INTERVIEW FORM

CHILD'S PIN: _____ SEX/D.O.B.: _____ DATE: _____

INTERVIEW WITH PARENTS

Details of referral concerns.

Family background and history.

Birth and developmental history.

Issues related to general health and behaviour in early years.

Status of behaviour at home.

Relationship with siblings.

Behaviour / reactions towards different individuals at home.

School history and previous testing.

School work performance or learning problems.

Status of behaviour at school.

Behaviour in the community (outside of home and school).

Interpersonal / social development.

Child's strength and weaknesses.

Parent management methods.

Parental goals and objectives.

INTERVIEW WITH TEACHERS

Skill level in each academic subject.

Class work habits and productivity.

Length of attention (especially for monotonous tasks).

Degree of activity on playground and during class.

Compliance with rules.

Manifestation of conduct problems.

Onset, frequency, and duration of inappropriate behaviour and the antecedent events.

Social skills and peer acceptance.

Information on any management techniques previously used and the special services now contemplated.

Teacher's goals and objectives.

INTERVIEW WITH THE CHILD

Perception of complaints by the teacher and parent.

Attitude toward family.

Attitude toward school.

Relationships with peers.

Three wishes for improvement.

Appendix E:

SCORING AND INTERPRETATION OF THE ADHD RATING SCALE-IV

NAME: _____ SEX/D.O.B.: _____

DATE OF COMPLETION: _____ CHRONOLOGICAL AGE: _____

SCALES	RAW SCORES	PERCENTILE
Parent's Hyperactivity-Impulsivity Subscale (HI)	Sum of even-numbered items	
Parent's Inattention Subscale (IA)	Sum of odd-numbered items	
Parent's Total Scale	Sum of HI and IA	
Teacher's Hyperactivity-Impulsivity Subscale (HI)	Sum of even-numbered items	
Teacher's Inattention Subscale (IA)	Sum of odd-numbered items	
Teacher's Total Scale	Sum of HI and IA	

GUIDE FOR INTERPRETATION

For ADHD-IA - needs to have a combination of subscale scores:-

Subscales	Ruling In		Ruling Out
	Definitely	Probably	
Teacher's Inattention Subscale	over or equal to 90 th percentile	between 80 th to 89 th percentile	Less than 80 th percentile
Parent's Inattention Subscale	over or equal to 93 rd percentile	between 85 th to 92 nd percentile	Less than 85 th percentile
Teacher's Hyperactivity-Impulsivity Subscale	lower or equal to 85 th percentile	-	-

For ADHD-C - needs to have a combination of subscale scores:-

Subscales	Ruling In		Ruling Out
	Definitely	Probably	
Teacher's Inattention Subscale	over or equal to 90 th percentile	between 80 th to 89 th percentile	Less than 80 th percentile
Parent's Inattention Subscale	over or equal to 93 rd percentile	between 85 th to 92 nd percentile	Less than 85 th percentile
Teacher's Hyperactivity-Impulsivity Subscale	over or equal to 98 th percentile	between 85 th to 97 th percentile	Less than 85 th percentile

For ADHD-HI, there are no cutoff scores available. The possibility of confirming ADHD-HI is through the ruling out of ADHD-IA and ADHD-C (i.e. less than 80th percentile for the Teacher's Inattention Subscale and less than 85th percentile for the Parent's Inattention Subscale), and that the Teacher's Hyperactivity-Impulsivity Subscale Score is over or equal to 98th percentile.

Other DSM-IV diagnostic criteria need to be fulfilled:-

- Some hyperactive-impulsive or inattentive symptoms have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level.
- Some hyperactive-impulsive or inattentive symptoms that caused impairment were present before age 7 years.
- Some impairment from the symptoms is present in two or more settings (e.g. school and at home).
- There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
- The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental disorder (e.g. Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

RESULT OF THE OVERALL INTERPRETATION

Diagnosis of ADHD indicated: ADHD-IA ADHD-HI ADHD-C

Other comorbid diagnoses: _____

Diagnosis of ADHD not indicated because _____

ACTION PLAN

COMPLETED BY: _____ DATE: _____

ADHD RATING SCALE-IV: HOME VERSION

Child's name _____ Sex: M F Age _____ Grade _____
 Completed by: Mother _____ Father _____ Guardian _____ Grandparent _____

Circle the number that *best describes* your child's home behavior over the past 6 months.

	Never or rarely	Sometimes	Often	Very often
1. Fails to give close attention to details or makes careless mistakes in schoolwork.	0	1	2	3
2. Fidgets with hands or feet or squirms in seat.	0	1	2	3
3. Has difficulty sustaining attention in tasks or play activities.	0	1	2	3
4. Leaves seat in classroom or in other situations in which remaining seated is expected.	0	1	2	3
5. Does not seem to listen when spoken to directly.	0	1	2	3
6. Runs about or climbs excessively in situations in which it is inappropriate.	0	1	2	3
7. Does not follow through on instructions and fails to finish work.	0	1	2	3
8. Has difficulty playing or engaging in leisure activities quietly.	0	1	2	3
9. Has difficulty organizing tasks and activities.	0	1	2	3
10. Is "on the go" or acts as if "driven by a motor."	0	1	2	3
11. Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort.	0	1	2	3
12. Talks excessively.	0	1	2	3
13. Loses things necessary for tasks or activities.	0	1	2	3
14. Blurts out answers before questions have been completed.	0	1	2	3
15. Is easily distracted.	0	1	2	3
16. Has difficulty awaiting turn.	0	1	2	3
17. Is forgetful in daily activities.	0	1	2	3
18. Interrupts or intrudes on others.	0	1	2	3

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ADHD RATING SCALE-IV: SCHOOL VERSION

Child's name _____ Sex: M F Age _____ Grade _____
 Completed by: _____

Circle the number that *best describes* this student's school behavior over the past 6 months (or since the beginning of the school year).

	Never or rarely	Sometimes	Often	Very often
1. Fails to give close attention to details or makes careless mistakes in schoolwork.	0	1	2	3
2. Fidgets with hands or feet or squirms in seat.	0	1	2	3
3. Has difficulty sustaining attention in tasks or play activities.	0	1	2	3
4. Leaves seat in classroom or in other situations in which remaining seated is expected.	0	1	2	3
5. Does not seem to listen when spoken to directly.	0	1	2	3
6. Runs about or climbs excessively in situations in which it is inappropriate.	0	1	2	3
7. Does not follow through on instructions and fails to finish work.	0	1	2	3
8. Has difficulty playing or engaging in leisure activities quietly.	0	1	2	3
9. Has difficulty organizing tasks and activities.	0	1	2	3
10. Is "on the go" or acts as if "driven by a motor."	0	1	2	3
11. Avoids tasks (e.g., schoolwork, homework) that require sustained mental effort.	0	1	2	3
12. Talks excessively.	0	1	2	3
13. Loses things necessary for tasks or activities.	0	1	2	3
14. Blurts out answers before questions have been completed.	0	1	2	3
15. Is easily distracted.	0	1	2	3
16. Has difficulty awaiting turn.	0	1	2	3
17. Is forgetful in daily activities.	0	1	2	3
18. Interrupts or intrudes on others.	0	1	2	3

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Appendix F: MPOC-20

PROCESSES OF CARE QUESTIONNAIRE

We would like to understand and measure the experiences of parents who have a child with a disability. In particular we wish to know about your perceptions of the care you have been receiving over the past year from the health care organization that provides services to your child. This may be your local children's treatment (rehabilitation) centre, your community care access centre, or another organization.

The care that you and your child receive from this organization may bring you into contact with many individuals. The questions on this form are grouped by who these contacts are, as described below.

PEOPLE:

refers to those individuals who work directly with you or your child. These may include psychologists, therapists, social workers, doctors, teachers, etc.

ORGANIZATION:

refers to all staff from the health care organization, whether involved directly with your child or not. In addition to health care people they may include support staff such as office staff, housekeepers, administrative personnel, etc.

The questions are based on what parents, like yourself, have told us about the way care is sometimes offered. We are interested in your personal thoughts and would appreciate your completing this questionnaire on your own without discussing it with anyone.

For each question, please indicate how much the event or situation happens to you. You are asked to respond by circling one number from 1 (Not at All) to 7 (To a Very Great Extent) that you feel best fits your experience. Please note that the zero value (0) is used only if the situation described does not apply to you.

When answering these questions, we would like you to think about the organization from which you first found out about this study. For easy reference, the name of that organization is:

PEOPLE refers to those individuals who work directly with you or your child. These may include psychologists, therapists, social workers, doctors, teachers, etc.

IN THE PAST YEAR	Indicate <u>how much</u> this event or situation happens to you.							
	To a Very Great Extent	To a Great Extent	To a Fairly Great Extent	To a Moderate Extent	To a Small Extent	To a Very Small Extent	Not at All	Not Applicable
TO WHAT EXTENT DO THE PEOPLE WHO WORK WITH YOUR CHILD...								
1. ... help you to feel competent as a parent?	7	6	5	4	3	2	1	0
2. ... provide you with written information about what your child is doing in therapy?	7	6	5	4	3	2	1	0

IN THE PAST YEAR

Indicate how much this event or situation happens to you.TO WHAT EXTENT DO THE
PEOPLE WHO WORK WITH
YOUR CHILD...

	To a Very Great Extent	To a Great Extent	To a Fairly Great Extent	To a Moderate Extent	To a Small Extent	To a Very Small Extent	Not at All	Not Applicable
3. ... provide a caring atmosphere <u>rather</u> than just give you information?	7	6	5	4	3	2	1	0
4. ... let you choose when to receive information and the type of information you want?	7	6	5	4	3	2	1	0
5. ... look at the needs of your "whole" child (e.g., at mental, emotional, and social needs) instead of just at physical needs?	7	6	5	4	3	2	1	0
6. ... make sure that at least one team member is someone who works with you and your family over a long period of time?	7	6	5	4	3	2	1	0
7. ... fully explain treatment choices to you?	7	6	5	4	3	2	1	0
8. ... provide opportunities for you to make decisions about treatment?	7	6	5	4	3	2	1	0
9. ... provide enough time to talk so you don't feel rushed?	7	6	5	4	3	2	1	0
10. ... plan together so they are all working in the same direction?	7	6	5	4	3	2	1	0
11. ... treat you as an <u>equal</u> rather than just as the parent of a patient (e.g., by not referring to you as "Mom" or "Dad")?	7	6	5	4	3	2	1	0
12. ... give you information about your child that is consistent from person to person?	7	6	5	4	3	2	1	0
13. ... treat you as an individual rather than as a "typical" parent of a child with a disability?	7	6	5	4	3	2	1	0
14. ... provide you with written information about your child's progress?	7	6	5	4	3	2	1	0
15. ... tell you about the results from assessments?	7	6	5	4	3	2	1	0

ORGANIZATION refers to all staff from the health care organization, whether involved directly with your child or not. In addition to health care professionals, these people may include support staff such as office staff, housekeeper, administrative personnel, etc..

IN THE PAST YEAR TO WHAT EXTENT DOES THE ORGANIZATION WHERE YOU RECEIVE SERVICES...	Indicate <u>how much</u> the event or situation happens to you.							Not Applicable
	To a Very Great Extent	To a Great Extent	To a Fairly Great Extent	To a Moderate Extent	To a Small Extent	To a Very Small Extent	Not at All	
16. ... give you information about the types of services offered at the organization or in your community?	7	6	5	4	3	2	1	0
17. ... have information available about your child's disability (e.g., its causes, how it progresses, future outlook)?	7	6	5	4	3	2	1	0
18. ... provide opportunities for the entire family to obtain information?	7	6	5	4	3	2	1	0
19. ... have information available to you in various forms, such as a booklet, kit, video, etc.?	7	6	5	4	3	2	1	0
20. ... provide advice on how to get information or to contact other parents (e.g., organization's parent resource library)?	7	6	5	4	3	2	1	0

Appendix G:**OCCUPATIONAL THERAPY FOR CHILDREN WITH
ATTENTION DEFICIT HYPERACTIVITY DISORDER (ADHD)****RESEARCH PROTOCOL TRAINING COURSE MANUAL****CONTENTS**

- (1) Introduction - Overall view of the Research Protocol
- (2) **An overall view of the Assessment Protocol**
- (3) Principles of Family-Centred Approach
- (4) The Measure of Processes of Care (MPOC)
- (5) DSM-IV Diagnostic Criteria of ADHD
- (6) ADHD Rating Scale – Administration, Scoring and Interpretation
- (7) Sensory Profile – Administration, Scoring and Interpretation
- (8) Interview with Parents, Teachers and the Child
- (9) Observational Assessment within School Environment
- (10) Other Assessment Areas & Tools e.g. DCDQ & SLI
- (11) Overall Interpretation of Assessment Results
- (12) Report Writing and Case Examples
- (13) **An Overall View of the Treatment Protocol**
- (14) Feedback Session with Parents and Teachers
- (15) Goal Setting and Treatment Planning with Parents and Teacher
- (16) Psycho-Educational Packs for Parents and Teachers
- (17) Behavioural Management
- (18) The Application of Principles of Sensory Modulation and Intervention Strategies in the Treatment of Children with ADHD
- (19) Classroom Management and Environmental Adaptation
- (20) Appendices

Appendix H:**PROGRAMME OF THE RESEARCH PROTOCOL TRAINING COURSE****28th to 30th January, 2004 (Wednesday to Friday)****Primary Care Education Centre,
West Ealing House, 2 St. James Avenue, West Ealing, London W13 9DJ****28th January, 2004 (Wed)****Topics**

- | | |
|-------------------------|---|
| 9:00 a.m. - 10:30 a.m. | (1) Introduction - Overall view of the Research Protocol
(2) An overall view of the Assessment Protocol |
| 10:30 a.m. - 11:00 a.m. | Tea / Coffee Break |
| 11:00 a.m. - 12:30 p.m. | (3) Principles of Family-Centred Approach
(4) The Measure of Processes of Care (MPOC) |
| 12:30 p.m. - 1:30 p.m. | Lunch Break |
| 1:30 p.m. - 3:00 p.m. | (5) DSM-IV Diagnostic Criteria of ADHD
(6) ADHD Rating Scale – Administration, Scoring and Interpretation. |
| 3:00 p.m. - 3:30 p.m. | Tea / Coffee Break |
| 3:30 p.m. - 5:00 p.m. | (7) Sensory Profile – Administration, Scoring and Interpretation. |

29th January, 2004 (Thurs)**Topics**

- | | |
|-------------------------|---|
| 9:00 a.m. - 10:30 a.m. | (8) Interview with Parents, Teachers and the Child
(8) Observational Assessment within School Environment
(10) Other Assessment Areas & Tools e.g. DCDQ & SLI |
| 10:30 a.m. - 11:00 a.m. | Tea / Coffee Break |
| 11:00 a.m. - 12:30 p.m. | (11) Overall Interpretation of Assessment Results
(12) Report Writing and Case Examples |
| 12:30 p.m. - 1:30 p.m. | Lunch Break |

1:30 p.m. - 3:00 p.m. (13) An Overall View of the Treatment Protocol
 (14) Feedback Session with Parents and Teachers
 (15) Goal Setting and Treatment Planning with Parents and Teacher

3:00 p.m. - 3:30 p.m. **Tea / Coffee Break**

3:30 p.m. - 5:00 p.m. (16) Psycho-Educational Packs for Parents and Teachers
 (17) Behavioural Management

30th January, 2004 (Friday) **Topics**

9:00 a.m. - 10:30 a.m. (18) The Application of Principles of Sensory Modulation and Intervention Strategies in the Treatment of Children with ADHD

10:30 a.m. - 11:00 a.m. **Tea / Coffee Break**

11:00 a.m. - 12:30 p.m. (18) Sensory Modulation Techniques (continued)

12:30 p.m. - 1:30 p.m. **Lunch Break**

1:30 p.m. - 3:00 p.m. (18) Sensory Modulation Techniques (continued)
 (19) Classroom Management and Environmental Adaptation

3:00 p.m. - 3:30 p.m. **Tea / Coffee Break**

3:30 p.m. - 4:30 p.m. (19) Classroom Management and Environmental Adaptation (continued)

Questions and Conclusion

Appendix I:**Hospital / Institution / Trust Headed Paper****EVALUATION OF AN OCCUPATIONAL THERAPY CARE PACKAGE
FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER
(ADHD)****INFORMATION SHEET FOR PARENTS**

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

WHAT IS THE PURPOSE OF THE STUDY?

Results of recent research studies indicate that effective treatment for children with ADHD requires a combination of different treatment methods and also working closely with parents and teachers. In order to develop best practice occupational therapy in helping families and children with ADHD, there are two main purposes of the study:-

1. To measure the parents' perceptions of the care they and their children received from the case occupational therapist through the implementation of a defined occupational therapy care package for children aged between 5 to 10 years old with ADHD.
2. To measure the effectiveness of the care package in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD.

The occupational therapy care package consists of a comprehensive assessment of your child's condition and also treatment programmes to be integrated into school and home environment. A team of 20 occupational therapists has been trained to implement the care package from different parts of the country. Your child's occupational therapist will work closely with you and your child's teacher by sharing current information on ADHD, setting goals and objectives of treatment and also providing regular guidance in implementing the treatment programmes. The whole package will last about 3 months. The case occupational therapist will see you or your child's teacher on a regular basis within the 3-month period.

This study is part fulfillment of the Chief Investigator's PhD study at the Department of Health Sciences and Social Care, Brunel University. Information generated in this pilot study will be used to refine/modify the structure and content of the care package. Further larger scale research may be carried out in the future.

WHY HAVE I BEEN CHOSEN?

You have been chosen to participate in the study by your child's occupational therapist as your child presents features of ADHD and also falls within the age band of children required for the study. The implementation of the care package is part of the routine work of the therapist as your child has been referred to the service. Your child's occupational therapist will also invite another family to participate in the study. There are a total of 20 occupational therapists involved in this study from different parts of the country. 40 families and children will be invited to participate.

DO I HAVE TO TAKE PART?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part, you are still free to withdraw at any time and without giving a reason. A decision to withdraw at any time, or a decision not to take part, will not affect the standard of care you receive. Your participation in this study is entirely voluntary.

WHAT WILL HAPPEN TO ME IF I TAKE PART?

If you decide to take part in the study, you will be involved in:-

1. A Comprehensive Assessment

- ◆ You and your child's teacher will be asked to complete different data forms, rating scales and questionnaires which are designed to gather information from parents and teachers on the child's behavioural patterns and abilities in motor skills, learning and daily life activities.
- ◆ You will need to attend at least two clinic appointments so that your child's occupational therapist can complete different formal assessment procedures. Each appointment will last about 1.5 to 2 hours. You are encouraged to take an active part in the process.
- ◆ The case occupational therapist will also make a school visit to observe your child within the school environment and interview the classteacher.

2. A Feedback Session

A feedback session will be arranged with you and your child's teacher in order to:-

- ◆ share information on the results of the comprehensive assessment,
- ◆ set common goals and objectives of treatment,
- ◆ select treatment programmes to be integrated into school and home environment,
- ◆ provide current information on ADHD.

3. Follow-up Sessions for the Implementation of Selected Treatment Programmes

- ◆ The case occupational therapist will organise 7 to 8 follow-up sessions with you and your child's teacher to introduce and implement the treatment programmes. These follow-up sessions will be on a weekly basis either with yourself, your child's teacher or both. They will either be in school or through clinic appointments.
- ◆ The aims of the follow-up sessions are to provide support for yourself and your child's teacher, to modify or adapt aspects of the treatment programmes, and to ensure close communication between all the parties involved.

4. Final Evaluation of the Care Package

- ◆ At the end of the 3 months, you will be asked to complete a questionnaire on your perception of the care received.
- ◆ You and your child's teacher will be asked to complete a rating scale to measure any changes in your child's behaviour both at home and in school.

WHAT ARE THE POSSIBLE DISADVANTAGES AND RISKS OF TAKING PART?

There are no identifiable disadvantages and risks of taking part. The occupational therapy care package incorporates the most recent research evidence and also concepts of best practice in supporting families and children with ADHD. All the case occupational therapists have attended a 3-day training course to ensure quality standards in implementing the care package.

WHAT ARE THE POSSIBLE BENEFITS OF TAKING PART?

Your child will be seen as part of the routine work of the case occupational therapist. We hope that the care package will help you and your child. However, this cannot be guaranteed. The information we get from this study may help us to treat future children with ADHD better.

WHAT HAPPENS WHEN THE RESEARCH STUDY STOPS?

The care package lasts for about 3 months. At the end of the care package, the case therapist will discuss with you the follow-up service that could be provided within the existing service locally. The decision about providing further follow-up sessions will also depend on you and your child's needs at the end of the care package.

WHAT IF SOMETHING GOES WRONG?

If taking part in this research project harms you or your child, there are no special compensation arrangements. If you are harmed due to someone's negligence, then you may have grounds for legal action but you may have to pay for it. Regardless of this, if you wish to complain, or have any concerns about any aspect of the way you have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to you.

WILL MY TAKING PART IN THIS STUDY BE KEPT CONFIDENTIAL?

All information which is collected about you and your child during the course of the research will be kept strictly confidential. Information about you and your child will be forwarded to the Chief Investigator of the research. You and your child's name and address will be coded so that you cannot be recognised. For good practice, your child's GP, Medical Consultant, and your child's teacher will be notified of your participation in the study.

Data collected will be locked in a filing cabinet belonging to the Chief Investigator. All paper and electronic data will be kept for one year and then destroyed after the completion of the study. Paper data will be destroyed by using a paper shredder.

WHAT WILL HAPPEN TO THE RESULTS OF THE RESEARCH STUDY?

The results of this research study will be reported in the Chief Investigator's PhD thesis which is scheduled to be completed around June/July, 2004. In order to share information with professionals within the field, an article reporting the results of the research will be submitted to the British Journal of Occupational Therapy. It is important to stress that you and your child will not be identified in the thesis and the journal article. As participants of the study, you can request a copy of the journal article through your child's occupational therapists once it is published.

WHO IS ORGANISING AND FUNDING THE RESEARCH?

The Chief Investigator has been awarded two PhD scholarships from the College of Occupational Therapy and the Hospital Saving Association. These contribute to the course fee and also research activities related to the PhD study. The 20 occupational therapists participating in the research study will not receive any extra remuneration except the free attendance to the 3-day training course to learn to implement the care package.

WHO HAS REVIEWED THE STUDY?

Dr. Frances Reynolds, the Chief Investigator's PhD supervisor, has reviewed the proposal of this study in order to ensure a high level of scientific quality. The West Midlands Multi-Centre Research Ethics Committee (MREC) has granted approval for this study.

CONTACT FOR FURTHER INFORMATION

If you have any queries about the study, you can discuss these with your child's occupational therapist or contact the Chief Investigator of the study:-

Sidney Chu MSc, SROT, OTR
Occupational Therapy Professional Lead, Ealing Primary Care Trust
Windmill Lodge (Ealing Hospital Site), Uxbridge Road, Southall, Middx UB1 3EU
Tel: 020-83548814 Fax: 020-8354-8948 E-mail: sidney.chu@btinternet.com

(Name of the Case Occupational Therapist)
Case Occupational Therapist
(Organisation, address, tel/fax no.)

Sidney Chu
Chief Investigator

THANK YOU FOR READING THIS INFORMATION SHEET.

IF YOU AGREE TO TAKE PART IN THE RESEARCH STUDY, PLEASE READ AND SIGN THE ENCLOSED CONSENT FORM. THE CASE OCCUPATIONAL THERAPIST WILL GIVE YOU A COPY OF THIS INFORMATION SHEET AND ALSO THE SIGNED CONSENT FORM.

1st December, 2003
Version 1.1

Appendix J:

Hospital / Institution / Trust Headed Paper

Centre Number:

Study Number: MREC/03/7/090

Patient Identification Number for this study:

CONSENT FORM

Title of Project: Evaluation of an Occupational Therapy Care Package for Children with Attention Deficit Hyperactivity Disorder (ADHD)

Name of Researcher: _____

Name of Child: _____ **Sex/D.o.B.:** _____

Please initial box

1. I confirm that I have read and understand the information sheet dated 14/9/03 version 1.0 for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my care and legal rights being affected.
3. I understand that sections of any of my child's case notes may be looked at by responsible individuals or by regulatory authorities where it is relevant to my child taking part in research. I give permission for these individuals to have access to my child's records.
4. I agree for my child and myself to take part in the above study.

Name of Parent_____
Date_____
Signature_____
Name of Researcher_____
Date_____
Signature

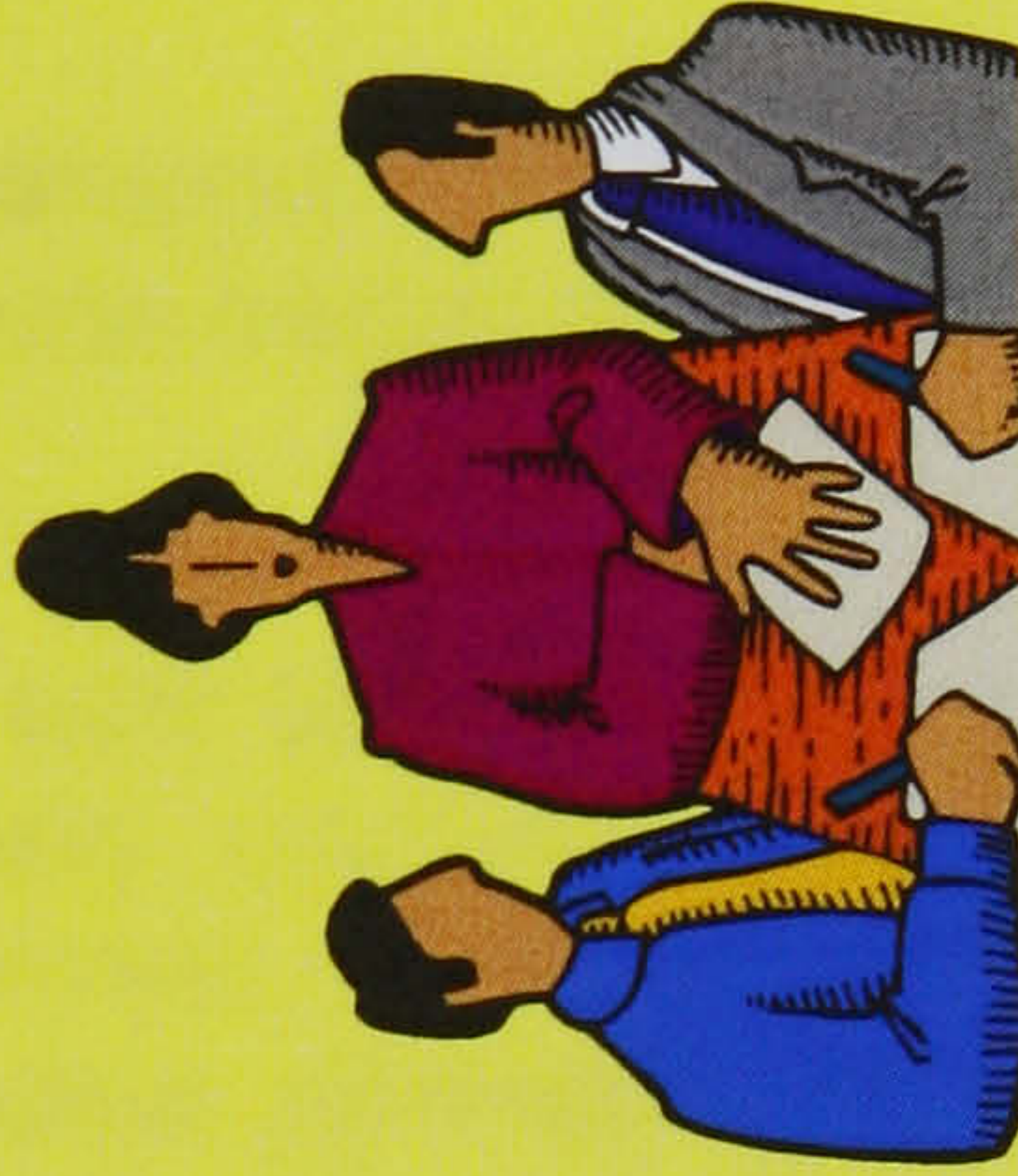
Copy for: Parents Researcher Case File

Your Occupational Therapist (OT) will

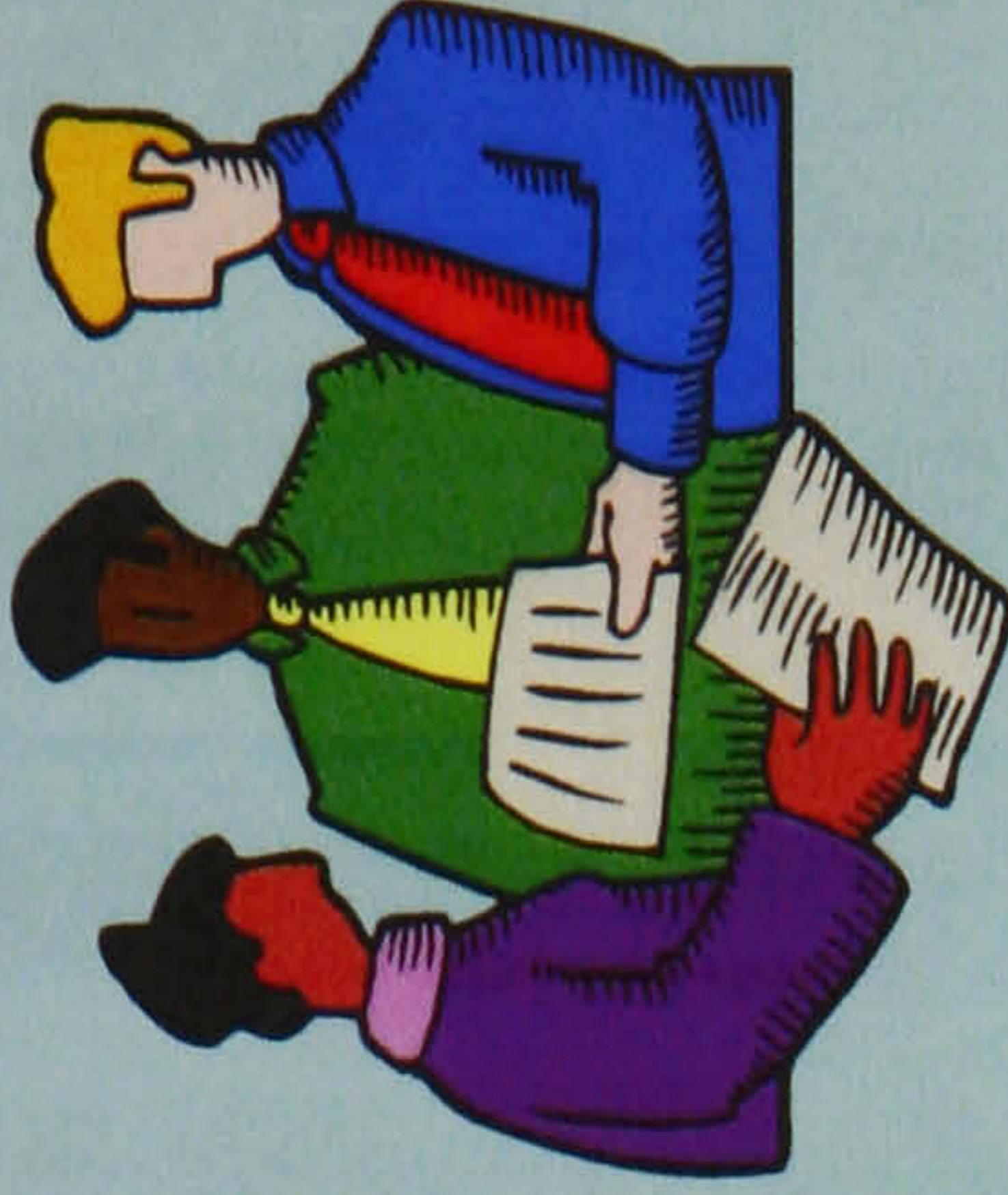
1. find out what you are good at and what sort of tasks you find difficult.



2. set the targets for what you want to achieve with you, your parents and teacher.



3. work out a plan to help you to achieve the targets.



4. carry out the plan with you, your parents and teacher.



5. check whether or not we have achieved the targets together at the end of the plan.



CONTRACT

I will work with my OT, parents and teacher to achieve the targets set.

Name:

Date:

Appendix L:**Hospital / Institution / Trust Headed Paper****EVALUATION OF AN OCCUPATIONAL THERAPY CARE PACKAGE
FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER
(ADHD)****INFORMATION SHEET FOR GPs****WHAT IS THE PURPOSE OF THE STUDY?**

Results of recent research studies indicate that effective treatment for children with ADHD requires a combination of different treatment methods and also working closely with parents and teachers. In order to develop best practice occupational therapy in helping families and children with ADHD, there are two main purposes of the study:-

1. To measure the parents' perceptions of the care they and their children received from the case occupational therapist through the implementation of a defined occupational therapy care package for children aged between 5 to 10 years old with ADHD.
2. To measure the effectiveness of the care package in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD.

The occupational therapy care package consists of a comprehensive assessment of the child's condition and also treatment programmes to be integrated into school and home environment. A team of 20 occupational therapists has been trained to implement the care package from different parts of the country. The child's occupational therapist will work closely with parents and the child's teacher by sharing current information on ADHD, setting goals and objectives of treatment and also providing regular guidance in implementing the treatment programmes. The whole package will last about 3 months. The case occupational therapist will see parents or the child's teacher on a regular basis within the 3-month period.

This study is part fulfillment of the Chief Investigator's PhD study at the Department of Health Sciences and Social Care, Brunel University. Information generated in this pilot study will be used to refine/modify the structure and content of the care package. Further larger scale research may be carried out in the future.

WHY HAS THE CHILD BEEN CHOSEN?

The child has been chosen to participate in the study by the case occupational therapist as the child presents features of ADHD and also falls within the age band of children required for the study. The implementation of the care package is part of the routine work of the therapist as the child has been referred to the service. The case occupational therapist will also invite another family to participate in the study. There are a total of 20 occupational therapists involved in this study from different parts of the country. 40 families and children will be invited to participate.

HAS PARENTAL CONSENT BEEN OBTAINED FOR THE CHILD TO TAKE PART IN THE RESEARCH?

Parents have been given a similar information sheet for them to make an informed choice for participation in the research. They have signed a consent form to participate in the research. It has been stressed that their participation in this study is entirely voluntary. They can withdraw from the research at any time knowing that the standard of care they receive will not be affected.

WHAT IS THE STRUCTURE AND CONTENT OF THE CARE PACKAGE?

1. A Comprehensive Assessment

- ◆ Parents and the child's teacher will be asked to complete different data forms, rating scales and questionnaires which are designed to gather information on the child's behavioural patterns and abilities in motor skills, learning and daily life activities.
- ◆ The family will need to attend at least two clinic appointments so that the case occupational therapist can complete different formal assessment procedures. Each appointment will last about 1.5 to 2 hours. Parents are encouraged to take an active part in the process.
- ◆ The case occupational therapist will also make a school visit to observe the child within the school environment and interview the classteacher.

2. A Feedback Session

A feedback session will be arranged with parents and the child's teacher in order to:-

- ◆ share information on the results of the comprehensive assessment,
- ◆ set common goals and objectives of treatment,
- ◆ select treatment programmes to be integrated into school and home environment,
- ◆ provide current information on ADHD.

3. Follow-up Sessions for the Implementation of Selected Treatment Programmes

- ◆ The research occupational therapist will organise 7 to 8 follow-up sessions with parents and the child's teacher to introduce and implement the treatment programmes. These follow-up sessions will be on a weekly basis either with parents, the child's teacher or both. They will either be in school or through clinic appointments.
- ◆ The aims of the follow-up sessions are to provide support to parents and the child's teacher, to modify or adapt aspects of the treatment programmes, and to ensure close communication between all the parties involved.

4. Final Evaluation of the Care Package

- ◆ At the end of the 3 months, parents will be asked to complete a questionnaire on their perception of the care received.
- ◆ Parents and the child's teacher will be asked to complete a rating scale to measure any changes in the child's behaviour both at home and in school.

WHAT ARE THE POSSIBLE DISADVANTAGES AND RISKS OF TAKING PART?

There are no identifiable disadvantages and risks of taking part. The occupational therapy care package incorporates the most recent research evidence and also concepts of best practice in supporting families and children with ADHD. All the case occupational therapists have attended a 3-day training course to ensure quality standards in implementing the care package.

WHAT ARE THE POSSIBLE BENEFITS OF TAKING PART?

The child will be seen as part of the routine work of the case occupational therapist. We hope that the care package will help the parents and the child. However, this cannot be guaranteed. The information we get from this study may help us to treat future children with ADHD better.

WHAT HAPPENS WHEN THE RESEARCH STUDY STOPS?

The care package lasts for about 3 months. At the end of the care package, the case therapist will discuss with parents the follow-up service that could be provided within the existing service locally. The decision about providing further follow-up sessions will also depend on the parents and the child's needs at the end of the care package.

WHAT IF SOMETHING GOES WRONG?

If parents wish to complain, or have any concerns about any aspect of the way they have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to them.

WILL THE PARENTS AND THE CHILD'S IDENTITY BE KEPT CONFIDENTIAL?

All information which is collected about parents and the child during the course of the research will be kept strictly confidential. Information forwarded to the Chief Investigator of the research will be coded so that their identities cannot be recognised. Data collected will be locked in a filing cabinet belonging to the Chief Investigator. All paper and electronic data will be kept for one year after the completion of the study. Paper data will be destroyed by using a paper shredder.

WHAT WILL HAPPEN TO THE RESULTS OF THE RESEARCH STUDY?

The results of this research study will be reported in the Chief Investigator's PhD thesis which is scheduled to be completed around June/July, 2004. In order to share information with professionals within the field, an article reporting the results of the research will be submitted to the British Journal of Occupational Therapy. It is important to stress that parents and the child will not be identified in the thesis and the journal article. If you are interested in receiving a copy of the article, you can request it through the child's research occupational therapists once it is published.

WHO IS ORGANISING AND FUNDING THE RESEARCH?

The Chief Investigator has been awarded two PhD scholarships from the College of Occupational Therapy and the Hospital Saving Association. These contribute to the course fee and also research activities related to the PhD study. The 20 occupational therapists participate in the research study will not receive any extra remuneration except the free attendance to the 3-day training course to learn to implement the care package.

WHO HAS REVIEWED THE STUDY?

Dr. Frances Reynolds, the Chief Investigator's PhD supervisor, has reviewed the proposal of this study in order to ensure a high level of scientific quality. The West Midlands Multi-Centre Research Ethics Committee (MREC) has granted approval for this study.

CONTACT FOR FURTHER INFORMATION

If you have any queries about the study, you can discuss these with the child's research occupational therapist or contact the Chief Investigator of the study:-

Sidney Chu MSc, SROT, OTR
Occupational Therapy Professional Lead, Ealing Primary Care Trust
Windmill Lodge (Ealing Hospital Site), Uxbridge Road, Southall, Middx UB1 3EU
Tel: 020-83548814 Fax: 020-8354-8948 E-mail: sidney.chu@btinternet.com

THANK YOU FOR READING THIS INFORMATION SHEET.

(Name of the Case Occupational Therapist)
Case Occupational Therapist
(Organisation, address, tel/fax no.)

Sidney Chu
Chief Investigator

1st December, 2003
Version 1.1

Appendix M:**Hospital / Institution / Trust Headed Paper****EVALUATION OF AN OCCUPATIONAL THERAPY CARE PACKAGE
FOR CHILDREN WITH ATTENTION DEFICIT HYPERACTIVITY DISORDER
(ADHD)****INFORMATION SHEET FOR TEACHERS****WHAT IS THE PURPOSE OF THE STUDY?**

Results of recent research studies indicate that effective treatment for children with ADHD requires a combination of different treatment methods and also working closely with parents and teachers. In order to develop best practice occupational therapy in helping families and children with ADHD, there are two main purposes of the study:-

1. To measure the parents' perceptions of the care they and their children received from the case occupational therapist through the implementation of a defined occupational therapy care package for children aged between 5 to 10 years old with ADHD.
2. To measure the effectiveness of the care package in producing significant change in the behavioural patterns of children aged between 5 to 10 years old with ADHD.

The occupational therapy care package consists of a comprehensive assessment of the child's condition and also treatment programmes to be integrated into school and home environment. A team of 20 occupational therapists has been trained to implement the care package from different parts of the country. The child's occupational therapist will work closely with parents and the child's teacher by sharing current information on ADHD, setting goals and objectives of treatment and also providing regular guidance in implementing the treatment programmes. The whole package will last about 3 months. The case occupational therapist will see parents or the child's teacher on a regular basis within the 3-month period.

This study is part fulfillment of the Chief Investigator's PhD study at the Department of Health Sciences and Social Care, Brunel University. Information generated in this pilot study will be used to refine/modify the structure and content of the care package. Further larger scale research may be carried out in the future.

WHY HAS THE CHILD BEEN CHOSEN?

The child has been chosen to participate in the study by the case occupational therapist as the child presents features of ADHD and also falls within the age band of children required for the study. The implementation of the care package is part of the routine work of the therapist as the child has been referred to the service. The case occupational therapist will also invite another family to participate in the study. There are a total of 20 occupational therapists involved in this study from different parts of the country. 40 families and children will be invited to participate.

HAS PARENTAL CONSENT BEEN OBTAINED FOR THE CHILD TO TAKE PART IN THE RESEARCH?

Parents have been given a similar information sheet for them to make an informed choice for participation in the research. They have signed a consent form to participate in the research. It has been stressed that their participation in this study is entirely voluntary. They can withdraw from the research at any time knowing that the standard of care they receive will not be affected.

WHAT IS THE STRUCTURE AND CONTENT OF THE CARE PACKAGE?

1. A Comprehensive Assessment

- ◆ Parents and the child's teacher will be asked to complete different data forms, rating scales and questionnaires which are designed to gather information on the child's behavioural patterns and abilities in motor skills, learning and daily life activities.
- ◆ The family will need to attend at least two clinic appointments so that the case occupational therapist can complete different formal assessment procedures. Each appointment will last about 1.5 to 2 hours. Parents are encouraged to take an active part in the process.
- ◆ The case occupational therapist will also make a school visit to observe the child within the school environment and interview the classteacher.

2. A Feedback Session

A feedback session will be arranged with parents and the child's teacher in order to:-

- ◆ share information on the results of the comprehensive assessment,
- ◆ set common goals and objectives of treatment,
- ◆ select treatment programmes to be integrated into school and home environment,
- ◆ provide current information on ADHD.

3. Follow-up Sessions for the Implementation of Selected Treatment Programmes

- ◆ The research occupational therapist will organise 7 to 8 follow-up sessions with parents and the child's teacher to introduce and implement the treatment programmes. These follow-up sessions will be on a weekly basis either with parents, the child's teacher or both. They will either be in school or through clinic appointments.
- ◆ The aims of the follow-up sessions are to provide support to parents and the child's teacher, to modify or adapt aspects of the treatment programmes, and to ensure close communication between all the parties involved.

4. Final Evaluation of the Care Package

- ◆ At the end of the 3 months, parents will be asked to complete a questionnaire on their perception of the care received.
- ◆ Parents and the child's teacher will be asked to complete a rating scale to measure any changes in the child's behaviour both at home and in school.

WHAT ARE THE POSSIBLE DISADVANTAGES AND RISKS OF TAKING PART?

There are no identifiable disadvantages and risks of taking part. The occupational therapy care package incorporates the most recent research evidence and also concepts of best practice in supporting families and children with ADHD. All the case occupational therapists have attended a 3-day training course to ensure quality standards in implementing the care package.

WHAT ARE THE POSSIBLE BENEFITS OF TAKING PART?

The child will be seen as part of the routine work of the case occupational therapist. We hope that the care package will help the parents and the child. However, this cannot be guaranteed. The information we get from this study may help us to treat future children with ADHD better.

WHAT HAPPENS WHEN THE RESEARCH STUDY STOPS?

The care package lasts for about 3 months. At the end of the care package, the case therapist will discuss with parents the follow-up service that could be provided within the existing service locally. The decision about providing further follow-up sessions will also depend on the parents and the child's needs at the end of the care package.

WHAT IF SOMETHING GOES WRONG?

If parents wish to complain, or have any concerns about any aspect of the way they have been approached or treated during the course of this study, the normal National Health Service complaints mechanisms should be available to them.

WILL THE PARENTS AND THE CHILD'S IDENTITY BE KEPT CONFIDENTIAL?

All information which is collected about parents and the child during the course of the research will be kept strictly confidential. It is important for the teacher involved to keep information confidential. Information forwarded to the Chief Investigator of the research will be coded so that their identities cannot be recognised. Data collected will be locked in a filing cabinet belonging to the Chief Investigator. All paper and electronic data will be kept for one year and then destroyed after the completion of the study. Paper data will be destroyed by using a paper shredder.

WHAT WILL HAPPEN TO THE RESULTS OF THE RESEARCH STUDY?

The results of this research study will be reported in the Chief Investigator's PhD thesis which is scheduled to be completed around June/July, 2004. In order to share information with professionals within the field, an article reporting the results of the research will be submitted to the British Journal of Occupational Therapy. It is important to stress that parents and the child will not be identified in the thesis and the journal article. If you are interested in receiving a copy of the article, you can request it through the child's research occupational therapists once it is published.

WHO IS ORGANISING AND FUNDING THE RESEARCH?

The Chief Investigator has been awarded two PhD scholarships from the College of Occupational Therapy and the Hospital Saving Association. These contribute to the course fee and also research activities related to the PhD study. The 20 occupational therapists participate in the research study will not receive any extra remuneration except the free attendance to the 3-day training course to learn to implement the care package.

WHO HAS REVIEWED THE STUDY?

Dr. Frances Reynolds, the Chief Investigator's PhD supervisor, has reviewed the proposal of this study in order to ensure a high level of scientific quality. The West Midlands Multi-Centre Research Ethics Committee (MREC) has granted approval for this study.

CONTACT FOR FURTHER INFORMATION

If you have any queries about the study, you can discuss these with the child's research occupational therapist or contact the Chief Investigator of the study:-

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THANK YOU FOR READING THIS INFORMATION SHEET.

(Name of the Case Occupational Therapist)
Case Occupational Therapist
(Organisation, address, tel/fax no.)

Sidney Chu
Chief Investigator

1st December, 2003
Version 1.0

Appendix N:

CODING SYSTEM

Therapists' Centre Numbers	Child 1 PIN	Child 2 PIN
ERC1	EC1	EC2
ERC2	EC3	EC4
ERC3	EC5	EC6
ERC4	EC7	EC8
ERC5	EC9	EC10
ERC6	EC11	EC12
ERC7	EC13	EC14
ERC8	EC15	EC16
ERC9	EC17	EC18
ERC10	EC19	EC20
ERC11	EC21	EC22
IRC1	IC1	IC2
IRC2	IC3	IC4
IRC3	IC5	IC6
SRC1	SC1	SC2
SRC2	SC3	SC4
SRC3	SC5	SC6
SRC4	SC7	SC8
WRC1	WC1	WC2
WRC2	WC3	WC4

Key: ERC = English Research Centres IRC = Irish Research Centres
 SRC = Scottish Research Centres WRC = Walsh Research Centres
 PIN = Patient Identification Number