



**The Hong Kong Society of
Child Neurology and Developmental Paediatrics**
香港兒童腦科及體智發展學會

Response to the 2005/06 Rehabilitation Programme Plan (RPP) Review Final Report

On 9th July 2007 at the Legco by Dr. Chan Chok Wan

On behalf of the Hong Kong Society of Child Neurology and Developmental Paediatrics

A) The Hong Kong Society of Child Neurology and Developmental Paediatrics (HKCNDP) is an active professional organization established by professionals from transdisciplinary areas and intersectoral domains dedicated to the advancement of knowledge, betterment of child health services, provision of public health education and promotion of child advocacy for the subspecialties of child neurology and developmental paediatrics. Child health embraces well being in the domains of *medical, social and education*.

B) HKCNDP is pleased to witness the successful Review of the Rehabilitation Programme Plan (RPP) and would like to congratulate members of the Committee for their hard work over the past two years. We are especially impressed by some enlightened members of the Committee together with the great leadership of Dr. York Chow, the Secretary for Health and Food, in finally including Specific Learning Disabilities (SLD) and Attention Deficit/Hyperactivity Orders (ADHD) into the category of disabilities which enables our children with these disorders to have official recognition and resources support at the family, school and the community. On behalf of our children we would like to say thank you for all your effort.

C) The Current RPP discussed the way forward with short and long term deliverables and objectives outlined for key areas, with specific measures proposed for various objectives. This is different from previous RPP's where service needs and provisions for the period covered were documented and enumerated. The purpose for this change was supposedly to allow flexibility of development over the period covered (of say 5 years), rather than pledge precise funds and provisions for each area. It is good in policy and principles but it is extremely difficult to perform end-of-term efficacy assessment. It thus follows that the Principles as proposed should be accompanied by Practical Guidelines (or Code of Practice) so that objective parameters are available for monitor outcome performance which is a vital component in modern management.

D) Our Society takes pride to present the Position Paper on SLD in February 2006 and the Position Paper ADHD on 5th July 2007 offering our professional services to RPP and to the community as a whole. These Position Papers are prepared by Hong Kong professionals from different disciplines and transectoral domains based on local literature, data and information with the

key targets to assist the HKSAR Government, Policy Makers, Professionals, Service Providers and the general public in the understanding of the nature of the conditions, their etiologic bases, mode of inheritance, clinical features, early identification, diagnosis and intervention, cutting edge management regimes, current confronting problems and their solutions in Hong Kong. We sincerely hope that both of these Position Papers will serve to achieve their goals and to fulfil their roles and missions.

E) HKCNDP has the following key comments on the current RPP

1. 10 Categories of disability: 8 categories of previous RPP and 2 additional categories of ADHD and SLD.

Issues:

- i. Under each category is a section on “major services required by persons of that category” – supposedly for reference only, but defines (and may limit) the **range of services that persons in each category may qualify for**. It is stated in this programme that “service users for various services ... are required *to fulfil established criteria and fall within the service scope of services/welfare benefit*”. This might result in denial of certain types of support that are not currently within the scope of services (e.g. children with difficulties because of early symptoms of SLD are not eligible for special preschool programmes – these children have to also suffer from global developmental delay to qualify – a contradiction in terms; **or** SLD and ADHD are currently not within the scope of special attention for further education - this may become an issue when students start to apply for special consideration as they proceed from secondary school to higher education).
- ii. Among the previous 8 categories “**speech impairment**” is still present, which here refers to “persons who cannot communicate effectively with others or whose speech difficulties draw undue negative attention to them ...”. Examples of causes include CVA, mental retardation, autism, SLI or even laryngectomy. This category is hence **symptom driven** and really cannot be acted upon like other categories with specific well understood disease basis and management. Advocacy for better **services for children with language impairment have not made any progress** during this review. The Hospital Authority has stone-walled this issue throughout, declaring that language impairment in children is of low priority for HA and these children should seek paid services outside (hence HA waits for preschool speech therapy are 1-2 years – often after the children are no longer in preschool). The social welfare department maintains that their special preschool services do not cover children with pure language issues but no co-morbidities such as global delay.

2. Prevention: **CCDS highlighted**. This needs committed steer, such that respective departments/bureaux can take real advantage of this opportunity, and not engage in resource fighting or compartmentalized service developments.
3. Medical Rehabilitation: **Serious shortfall in mental health services** for all categories. Child psychiatry service waits are up to 3 years, and only the most severe cases are given timely and substantial support. Support by child psychiatry teams to schools and community where much of the problems arise is minimal.
4. Preschool services: **Further refinement of levels of special support** is required.
 - i. Currently EETC support for each admitted child comes with “standard set” of speech / occupational / physiotherapists and child care workers (so called 3T 1C support). This is not necessary for all cases, and is the reason for barring those with problems in one domain (e.g. language impairment or ADHD) from these services. **Individualized prescription specific discipline’s support** is considered administratively problematic, and likely to be resisted by stake-holders (service operators).
 - ii. Children with **less serious problems** may be supported through group training and parent training. These are now only available within the standard programmes which they may not qualify for.
 - iii. **Education Bureau does not support preschool special educational services**. They rely on other services to identify at risk children, on DH to provide assessment for preschool and Primary One admission preparation, and on SWD to support all sorts of special education for these children in preschool. They call these “rehabilitation services” rather than education, including for mental delay, language and reading difficulties, etc.
5. Education Services
 - i. Ed Bureau needs to **monitor schools’ inclusive education measures** through supporting and monitoring them. For example, Ed Bureau’s **additional grants funds to schools for various SEN purposes may be used in ways that are neither quality controlled, effective nor accountable**. This was addressed in the Plan through “compiling operational guides” for schools, which is inadequate.
 - ii. After secondary school, only transition of special school leavers to post-school training (e.g. VTC/skills centres) and work was mentioned. **Facilitation of transition to higher education for those with the potential** for formal tertiary education, e.g. those with hearing or visual impairment, SLD and ADHD, were not addressed.
 - iii. Effort to **open dialogue with local universities** for supporting admission (through accommodations and waivers in related areas of disability), and supporting education

for all students with special needs (through a full range of support within the university – not just ramps and Braille type facilities) should be initiated immediately.

- iv. **Ed Bureau does not, but must involve itself in preschool education**, including those with special needs.

6. Self help Organizations

- i. SWD provides some financial and consultative support to self- help organizations on their setting up and development. Much **more substantial support, including hands on advice on organizational work and on the disability subject**, is needed if these groups are to flourish as knowledgeable and effective organizations for their members.

7. Barrier Free Access / IT

- i. So far, barrier freedom refers to physical access mainly. Making transport providers comply, e.g. with PWD friendly buses and elevator access at all MTR entrances (bus and MTR companies, for example) by legislation and enforcement is essential. Requirements on buildings must also be enforced. Currently **government is often yielding to major stakeholders** (such as transport companies and real estate developers), and moving progress takes decades.
- ii. **IT facilities and adaptive devices** are prescribed to patients who are discharged from hospital with severe disabilities (especially tetraplegic patients). However those already in the community (eg. those with severe developmental physical disabilities) are not covered by this scheme.

- 8. Hong Kong is still adopting the old “WHO Classification of Impairment, Disability and Handicap” of 1980 which is outdated. It is high time that we should consider incorporating concept of the “WHO International Classification of Functions of 2002” **into Hong Kong’s rehabilitation work** as soon as possible in order to keep our Rehabilitation work abreast of the international arena.

- 9. **Implementation of this RPP should be kept in close monitoring** by both RAC and stake holders through regular review meetings and consultations.

- 10. The **next RPP review should be made no later than 5 years** after the launching of this Plan.

Thank you for your attention.

For and on behalf of the Society Council

A handwritten signature in black ink, appearing to read 'Chan Chok-wan', with a small flourish at the end.

Dr. CHAN Chok-wan

President, the Hong Kong Society of Child Neurology and Developmental Paediatrics (HKCNDP)

9th July 2007

Encl. 1) "HKCNDP Position Paper on SLD and Dyslexia" February 2006

2) "HKCNDP Position Paper on ADHD" July 2007

Specific Learning Disabilities and Dyslexia in Hong Kong

Position Paper on Future Directions

This paper is based on the Forum on Specific Learning Disabilities (SLD) organized by the Hong Kong Society of Child Neurology &

Developmental Paediatrics on 28th July 2005 to arrive at a position paper on future directions for

Specific Learning Disabilities and Dyslexia in Hong Kong

Participants at 28 July 2005 Specific Learning Disabilities Forum Organised by Hong Kong Society of Child Neurology & Developmental Paediatrics

Dr CHAN Chok-wan	President HKCNDP & Chairman of HKCNDP SLD Working Party
Mrs BLOMFIELD Daphne	Council Member, The Pathways Foundation
Ms CHAN Eva S M	Educational Psychologist, Tung Wah Group of Hospitals
Ms CHAN May C K	Educational Psychologist, Society of Boys' Centres
Dr CHENG Pui-wan	Assistant Professor, Department of Educational Psychology, The Chinese University of Hong Kong
Dr CHIU Becky S K	Paediatrician, Department of Paediatrics, Tseung Kwan O Hospital
Mrs CHIU Becky M Y	Clinical Psychologist, Department of Health
Dr HO Connie S H	Associate Professor, Department of Psychology, The University of Hong Kong
Dr HUNG Chi-hong	Member, HK Association of Specific Learning Disabilities
Mrs HUNG Gladys	Member, HK Association of Specific Learning Disabilities
Mrs KEUNG Iris W L	Chairman, HK Association of Specific Learning Disabilities
Ms KWONG Carol S C	Principal, HKSKH Bishop Hall Secondary School
Dr LAI CHENG Alice C G	Associate Professor, Department of Applied Social Sciences, The Hong Kong Polytechnic University
Dr LAM Catherine C C	Council Member, HKCNDP
Mrs LAM Daisy W C	Project Officer/Home-School Support Projects for Students with Dyslexia, Department of Social Work and Social Administration, The University of Hong Kong
Dr LAM Fanny W F	Paediatrician, Department of Health
Prof. LEONG Che-kan	Research Professor Emeritus, Department of Educational Psychology and Special Education, University of Saskatchewan, Canada; & Hon. Professor, Educational Psychology, The Chinese University of Hong Kong
Mrs LING Alice H Y	Principal Coordinator, School Social Work Service, Hong Kong Christian Service
Dr SIN Kuen-fung	Senior Lecturer, Department of Educational Psychology, Counselling and Learning Needs, The Hong Kong Institute of Education
Mrs TING Cecilia Y K	Council Member, The Pathways Foundation
Ms TSANG Lucia YH	Clinical Psychologist, Department of Health
Dr TSANG Sandra K M	Associate Professor, Department of Social Work and Social Administration, The University of Hong Kong & Registered Clinical Psychologist
Dr TSE Philomena W T	Paediatrician, Department of Paediatrics, Caritas Medical Centre

Background

Specific Learning Disabilities (SLD) (特殊學習障礙) is often referred to as the hidden handicap, with dyslexia (讀寫障礙) being present in the great majority of individuals in this group of disorders. Persons with dyslexia are characterized by severe deficits in reading, spelling and writing to dictation. The condition is disabling in that affected individuals' deficiencies in literacy, if not habilitated early and effectively, will lead directly and through secondary effects and emotional complications to severe impairments in learning, daily activities and contribution to society. It is today widely considered as a public health issue with marked educational and social dimensions, requiring multi-disciplinary and cross-sectoral attention.

SLD and dyslexia have received increasing professional and public awareness in Hong Kong over the past decade. Systematic measures to identify, assess and support affected individuals in education and the community are being continually developed. At the 2005-06 review of the Rehabilitation Programme Plan (RPP), the RPP Working Group and Rehabilitation Advisory Committee resolved that SLD is a disabling condition that should be added into RPP as a category of disability.

Definition¹

SLD is a term that refers to a group of disorders manifested as significant difficulties in the acquisition and use of listening, speaking, reading, writing or mathematical abilities, despite access to conventional teaching. These disorders are intrinsic to the individual and neurobiological in origin, with onset in childhood and extending beyond it. Language processing difficulties distinguish SLD as a group.

SLD is not the direct result of sensory impairment, mental retardation, social and emotional disturbance or environmental

¹ This operational definition was drafted jointly at the HK Society of Child Neurology & Developmental Paediatrics Forum on SLD on 28 July 2005, with academic and practicing representatives from medicine and allied health, education, psychology, social work, parent groups and administration (Appendix A). It is based on current knowledge of these conditions.

influences (e.g. cultural differences or insufficient / inappropriate instruction). Accompanying weaknesses may be identified in areas of speed of processing, working memory, phonological recoding, fine-grained auditory and/or visual processing, sequencing, organization, and motor coordination. Some individuals with SLD have outstanding skills. Some may have skills that are masked by their SLD, while other individuals may have strengths in aspects not affected by their SLD.

Developmental Dyslexia is one of the specific learning disabilities, characterized by difficulties with accurate and fluent word recognition, word reading and writing to dictation or spelling. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and further acquisition of knowledge through print. Unexpected discrepancy exists between learning aptitude and achievement in school in one or more basic subject areas.

It is acknowledged that SLD may co-occur with other developmental disorders. Attention deficit / hyperactivity disorder (ADHD), with its own different neurological basis, diagnosis and treatment, is not a form of SLD, but may also occur in individuals with SLD.

Corresponding terminology for SLD in the *International Statistical Classification of Diseases and Related Health Problems – Tenth Revision (ICD-10)* is under the group “Specific Developmental Disorders of Scholastic Skills”, as listed in Appendix A.

Prevalence

Data reported by the Hong Kong Specific Learning Difficulties Research Team (Chan, Ho, Tsang, Lee & Chung (under review))¹ indicated that, based on a study at 27 schools in Hong Kong, Kowloon and the New Territories with the use of the *Hong Kong Test of Specific Learning Difficulties in Reading and Writing (HKT-SpLD)* (Ho CSH, Chan DWO, Tsang SM & Lee SH, 2000)², the prevalence rate of specific learning difficulties in reading and writing (dyslexia) in Hong Kong is 9.7% to 12.6% with 6.2% to 8.7%

mild cases, 2.2% to 2.3% moderate cases and 1.3% to 1.6% severe cases.

Figures on SLD cases reported by the Education & Manpower Bureau (EMB) were 461 in 2000-01, 948 in 2001-02, 980 in 2002-03, 922 in 2003-04 and 1,065 in 2004-05 respectively. A total of 4,376 students with SLD in all primary and secondary schools were identified within these past five years. While these figures may reflect the workload presented to EMB, they do not reflect how serious the Hong Kong situation is. Their distribution within schools of different academic achievement also varies significantly.

Types of Services

Early Identification

With the aim of achieving early identification of varied needs of children so that appropriate services can be made available to them in a timely manner, an inter-sectoral community-based programme, the Comprehensive Child Development Service (0-5 years) will be launched (2005 Policy Address of the HKSAR Government)³. Needs of children at risk for SLD are expected to be included.

The *Hong Kong Learning Behaviour Checklist for Preschool Children (Parent Version)*, a tool for parents to identify preschool children at risk for SLD, was introduced at the end of 2005 (Hong Kong SLD Research Team 2006)⁴. A screening instrument for preschool teachers to identify at risk children for follow up still needs to be developed. A teacher's checklist for identifying SLD students in secondary schools is being considered, and should be completed as soon as possible.

In 2000, *The Hong Kong Specific Learning Difficulties Behaviour Checklist for Primary School Pupils* (Hong Kong SLD Research Team 2000)⁵ was made available to schools to assist teachers in identifying students suspected to have specific learning disabilities; and from 2004 September, a new Primary One Checklist screening for Learning Abilities (EMB, 2004)⁶ was launched, where Chinese, English, mathematics, social adaptation, verbal language and

motor abilities of Primary One students can be checked to identify any learning problems and further educational needs. Teachers are expected to provide additional support to those identified as at risk, and to refer out those who are identified as having significant difficulties.

Assessment

Assessment of suspected SLD cases generally takes place within the educational setting after learning problems are noticed. EMB and outsourced educational psychology services help to provide diagnosis. Assessment for diagnosis is made by educational psychologists with standardized tools. Timely response to request for assessment is needed, with parents informed of the results and plans in order to maximize school-family cooperation.

Sometimes, cases may present to the health care sector, such as those where the underlying SLD is masked by other problems, like behavioural, emotional or other developmental and health problems. These children will be assessed by relevant professional disciplines, including clinical psychologists, from child assessment centres, certain hospital teams, non-government organisations (NGOs) and private settings. Follow up management of dyslexia itself remains within the school system, while other conditions diagnosed, such as attention deficit, motor coordination, hearing, visual and emotional problems, will be referred to respective service providers for treatment.

In Hong Kong, the HKT-SpLD was developed in 2000 for assessing primary school children up to ages 10½ years². Further norming of three subtests of this HKT-SpLD for Primary 5 and Primary 6 students is being done, for these data to be included in the 2nd edition of the HKT-SpLD in 2006⁷. A tool for assessing dyslexia in Secondary 1 to 3 is being developed by the Hong Kong Specific Learning Difficulties Research Team, and is expected to be published around the end of 2006⁷. Reading achievement levels

for grade and age are needed in Hong Kong to document baselines and monitor progress.

Education

Remediation and Accommodations

Students with SLD are educated in mainstream schools. Both direct remediation for dyslexia and accommodations in schools and examinations should be provided for these students.

Direct evidence-based remediation for dyslexia in adequate amount and with outcome measures is important. Promoting oral language skills and phonological / orthographic awareness skills through heightened reading and literacy programmes for at risk children is valuable. Teachers delivering these programmes should have a relevant language background, with training in dyslexia remediation for Chinese, English, and English as a Second Language (ESL). For secondary schools, the availability of special education needs coordinators (SENCO) with a strong language background is desirable. A differentiated curriculum may be required for some children. Strength discovery and development outside of the formal curriculum as well as portfolio building should be emphasized for these children.

The format for delivering the above curriculum and programmes may include pull-out teaching, co-teaching within the classroom and Individualised Education Plans (IEP). After school support programmes will also be valuable for those without adequate support at home.

Examination Accommodations

Many schools and parents are still unaware of the availability of accommodations for eligible students with dyslexia (at schools' internal examinations during Primary 5 and 6 for secondary school entrance placement, at the Hong Kong Certificate of Education Examination (HKCEE) and the Hong Kong Advanced Level

Examination (HKALE)). Applications by secondary schools on behalf of these students for open examination accommodations are still minimal compared with actual need. Effort is needed from EMB and the Hong Kong Examination and Assessment Authority (HKEAA) to promote awareness of such examination accommodations to school administrators, parents and students, and to ascertain compliance within schools. The range of accommodation measures that can be provided for students with SLD needs to be widened as indicated, including the use of computers or having questions read out and answers given orally.

School Support

Teachers' knowledge and skills in managing SLD are necessary prerequisites. At least one teacher with a special education background should be available in each school to support students with special education needs (SEN). EMB recommends an explicit school policy for delivering and monitoring quality, timeliness and outcome of services for all SEN students. Small classes are essential if adequate frontline teachers' participation in identification and remediation is to be provided. It is also felt that the Government could encourage and reward dyslexia-friendly schools through a set of outcome indicators, where good support for students with SLD and a genuinely inclusive atmosphere are ensured.

EMB is currently providing support to children with a variety of SENs in primary schools either through its ongoing intensive remedial support programme or its New Funding Model where \$10,000 to \$20,000 per annum is provided to a student with SEN. Secondary schools with high intake of bottom 10% of junior secondary students are supported by the School-based Remedial Support Programme (SBRSP), which provides remedial teaching to students in basic subjects of Chinese, English and Mathematics; while all secondary schools are supported by school social work service which aims to identify and help students with academic, social and emotional problems. For SLD, it is proposed that earmarked resources within the school to support students with SLD at different stages of education be considered. Adequate access to computer use and related SLD software in schools is

necessary.

Motivational factors are important in helping students with SLD in schools. Although some of these students may not be able to achieve much concrete progress in terms of standard school achievement results at this juncture, the attention and understanding given to them by good school-parent-child teamwork are valuable in rejuvenating their interest in learning and self-esteem. Parent-school collaboration in helping these children is considered critical for success.

Studies at Hong Kong's Special Schools for Social Development (special schools set up for students with serious emotional and behavioural problems) have shown that over 50% of students universally tested upon admission to primary school have been positively diagnosed with SLD⁸, demonstrating a marked over-representation of SLD within groups of young people with serious emotional and behavioural problems. Such psychological problems are believed to be significantly related to the negative experience that students with SLD go through in regular schools, where their condition is either unidentified or not appropriately supported. Intensive psychosocial remediation through collaboration of school, family and community is needed for these young persons, before it is possible to redirect them into a positive academic learning path.

A special school for some students with SLD who need intensive and specialist attention (full time, part time or temporary enrolment), should actively considered.

Higher Education

Due to the relatively limited flexibility of today's curriculum and open examination systems, students with SLD in Hong Kong today usually can only manage to access tertiary education through vocational training and sub-degree programmes. With the proposed New Academic Structure for Senior Secondary Education and Higher Education (EMB, 2005)⁹, where whole-person development approach and liberal studies as a core subject are

highlighted, the time is ripe for considering a wider curriculum selection and credit based system for secondary students, particularly those with SLD. This would allow development and maximization of these students' areas of strength and enhance opportunities for them to access tertiary education in their areas of competence and special talents.

Concessions on language requirements at university entrance should be considered for students with dyslexia who demonstrate adequate standards for the subject applied, in order to remove undue barriers for access to tertiary education.

Learning disabilities support centres in tertiary institutions need to strengthen their resources and support for students with SLD, who comprise the large majority of students with special needs within tertiary institutions of developed countries.

Adults with SLD

Issues relating to adults with dyslexia, including adult literacy education, remedial training, accommodations in professional licence examinations and in the workplace, need to be addressed.

Community Support and Development of Self-help Groups

Public education to increase understanding of SLD, reduce misconceptions, and foster an inclusive atmosphere towards SLD is important.

Public organisations and NGOs are currently providing a number of parent support programmes for families of children with SLD. However, a system to ascertain the quality of such programmes is needed. More promotion is still needed to introduce these services to families. Peer support groups such as the Hong Kong Association for Specific Learning Disabilities (HKASLD) parent group provide valuable platforms for families of children with SLD in HK to share resources, experience and aspirations.

Professional Training

Because of the high prevalence of students with SLD within mainstream schools, all teachers and school administrators need to have a basic understanding and awareness of SLD. Modules in SLD for undergraduate teachers should be compulsory, and in-service training for all existing teachers and school administrators on SLD is recommended. It is proposed that the Advisory Committee on Teacher Education and Qualifications (ACTEQ) study the demands placed on teachers by students with SLD, and include the subject in pre-service teacher education, as well as promoting teachers' and principals' continuing professional development in this area.

In 2005, EMB commissioned a 30-hour basic course for in-service teachers on SLD in Chinese and English. The first batch of training commenced in the 2005 September school year. More advanced courses focusing on SLD are recommended in future. Specific functional posts with positive career paths are recommended for these specially trained teachers.

Because courses today mainly provide basic awareness of the condition and the whole process of teacher empowerment is expected to take a number of years, Hong Kong teachers at this time rely strongly on specialist support, especially by educational psychologists, to provide timely diagnosis and delivery of effective remediation programmes. A system to ascertain the quality of such support is needed.

Issues of Special Concern

The following areas for research and development in Hong Kong are identified:

- (a) Studies on emerging literacy milestones in Chinese for identifying at risk preschool children;
- (b) Identification instruments for parents and teachers for preschool and all school levels;

- (c) Diagnostic assessment instruments at different ages;
- (d) Reading achievement levels for grade and age in Hong Kong to document baselines and monitor progress;
- (e) Development of validated intervention methods for step-wise reading remediation in Chinese and in English as a second language;
- (f) Teaching approach for language and other content subjects for students with SLD, especially in higher grades;
- (g) Stock-taking of higher education opportunities for students with dyslexia in Hong Kong;
- (h) Development of counselling and social remediation programmes for students with dyslexia with significant and prolonged school failure;
- (i) Parents' role in supporting the child at home and as a team member within the school;
- (j) Effects of dyslexia-friendly teaching on students with and without dyslexia.

The following SLD related concerns in public education should be addressed:

- (a) Public awareness of the presence and nature of SLD to be promoted;
- (b) Concept of equal opportunity and rights from the perspectives of both affected and unaffected individuals and families, to be made understood to the public;
- (c) A supportive community for adults with SLD to be developed and enhanced.

References

1. Chan CW, Ho CSH, Tsang SM, Lee SH, and Chung KKH (under review). Prevalence, gender ratio, and gender differences in reading-related cognitive abilities among Chinese children with dyslexia in Hong Kong.
2. Ho CSH, Chan DWO, Tsang SM & Lee SH (2000). *The Hong Kong Test of Specific Learning Difficulties in Reading and Writing*. Hong Kong Specific Learning Difficulties Research Team.

3. The 2005 Policy Address of the HKSAR Government. *Working Together for Economic Development and Social Harmony*. P.16.
4. Hong Kong Specific Learning Difficulties Research Team (2006). 學前兒童學習行為量表〔家長版〕.
5. Ho, CS, Chan, DW, Lee, SH, Tsang, SM, & Lee S H (2002). *The Hong Kong Specific Learning Difficulties Behaviour Checklist (for Primary School Pupils)*. Hong Kong Specific Learning Difficulties Research Team
6. Education and Manpower Bureau, the HKSAR Government (2004). 及早識別和輔導有學習困難的小一學生.
7. Hong Kong Specific Learning Difficulties Research Team (2005). Personal Communications.
8. Chan, CK (2004). Identification study on students with Specific Learning Difficulties in Schools for Social Development of the Society of Boys' Centres. In Shek, DTL (Ed), *Adolescents with Emotional and Behavioural Problems: Residential and Educational Services in Chinese Societies*. The Commercial Press (HK)
9. Education and Manpower Bureau, the HKSAR Government (2005). *The New Academic Structure for Senior Secondary Education and Higher Education – Action Plan for Investing in the Future of Hong Kong*.

January 2006

**International Statistical Classification of Diseases and Related Health Problems
Tenth Revision**

F81	<p>Specific developmental disorders of scholastic skills</p> <p>Disorders in which the normal patterns of skill acquisition are disturbed from the early stages of development. This is not simply a consequence of a lack of opportunity to learn, it is not solely a result of mental retardation, and it is not due to any form of acquired brain trauma or disease.</p>
F81.0	<p>Specific reading disorder</p> <p>The main feature is a specific and significant impairment in the development of reading skills that is not solely accounted for by mental age, visual acuity problems, or inadequate schooling. Reading comprehension skill, reading word recognition, oral reading, skill and performance of tasks requiring reading may all be affected. Spelling difficulties are frequently associated with specific reading disorder and often remain into adolescence even after some progress in reading has been made. Specific developmental disorders of reading are commonly preceded by a history of disorders in speech or language development. Associated emotional and behavioural disturbances are common during the school age period.</p> <p>“Backward reading”</p> <p>Developmental dyslexia Specific reading retardation</p> <p>Excludes: alexia NOS (R48.0) dyslexia NOS (R48.0) reading difficulties secondary to emotional disorders (F93.-)</p>
F81.1	<p>Specific spelling disorder</p> <p>The main feature is a specific and significant impairment in the development of spelling skills in the absence of a history of specific reading disorder, which is not solely accounted for by low mental age, visual acuity problems, or inadequate schooling. The ability to spell orally and to write out words correctly are both affected.</p> <p>Specific spelling retardation (without reading disorder)</p> <p>Excludes: agraphia NOS (R48.8)</p> <p style="padding-left: 20px;">spelling difficulties:</p> <ul style="list-style-type: none"> ♦ associated with a reading disorder (F81.0) ♦ due to inadequate teaching (Z55.8) ♦
F81.2	<p>Specific disorder of arithmetical skills</p> <p>Involves a specific impairment in arithmetical skills that is not solely explicable on the basis of general mental retardation or of inadequate schooling. The deficit concerns mastery of basic computational skills of addition, subtraction, multiplication, and division rather than of the more abstract mathematical skills involved in algebra, trigonometry, geometry, or calculus.</p> <p>Developmental:</p> <ul style="list-style-type: none"> ♦ acalculia ♦ arithmetical disorder ♦ Gerstmann’s syndrome <p>Excludes: acalculia NOS (R48.8)</p> <p style="padding-left: 20px;">arithmetical difficulties:</p> <ul style="list-style-type: none"> ♦ associated with a reading or spelling disorder (F81.3) ♦ due to inadequate teaching (Z55.8) ♦



**The Hong Kong Society of
Child Neurology & Developmental Paediatrics**
香港兒童腦科及體智發展學會

**兒童專注力失調 / 過度活躍症
2007 報告書**

專注力失調/過度活躍症 工作小組

成員

陳作耘醫生	香港兒童腦科及體智發展學會主席
藍芷芊醫生	香港兒童腦科及體智發展學會幹事
劉啓泰先生	香港衛生署高級臨牀心理學家
李湄珍教授	香港大學臨牀心理學系教授
梁永亮教授	香港中文大學臨牀心理學系教授
廖嘉怡醫生	香港衛生署高級醫生
蕭寧波教授	香港中文大學教育心理學系副教授

諮詢專家

香港醫管局兒童精神科服務工作小組

陸兆鑾醫生

香港中文大學精神科學系教授

何灝生教授

嶺南大學經濟學系教授

石丹理教授

香港中文大學社會工作學系教授

李志超醫生

香港醫管局精神科顧問醫生

鄭佩芸教授

香港中文大學教育心理學系助理教授

2007 年 3 月 21 日

草擬文件諮詢論壇

參與成員

Chan Chok Wan	President, HKCNDP
May Chan	Educational Psychologist, Society of Boys' Centres
Eva Chan	Educational Psychologist, TWGH
Chan Kwok Chiu	Paediatrician, AHNH
CB Chow	Paediatrician, CMC
Daphne Blomfield	Pathways Foundation
Daisy Lam	HKU Research Team
Cheng Pui Wan	Department of Educational Psychology, CUHK
Cheung Chiu Hung	Legislative Council Member
Chow Luk Ying Pui	Principal, HCS Memorial School
Ferrick Chu	Equal Opportunities Commission
Ho Lok Sang	Department of Economics, Lingnan University
Hung Chi Hong	HKASLD
Hung Wong Lai Ping	Principal, Caritas St. Joseph Secondary School
Hung See Fong	Child Psychiatry, KCH
Iris Keung	HK Association of Specific Learning Disabilities
Carol Kwong	Principal, HMW Secondary School
Kelly Lai	Child Psychiatry, AHNH
Catherine Lam	Developmental Paediatrician, HKCNDP
Joseph Lau	Clinical Psychology, Child Assessment Service
Clement Law	Chairman, HK Association for AD/HD
Lee Chi Chiu	Psychiatry, YMTCCP
Julie Lee	Chairperson, Parents' Association of Pre-school Handicapped Children
Tatia Lee	Department of Clinical Psychology, HKU
Cynthia Leung	HK Institution of Education
Justina Leung	Director, BGCA
Patrick Leung	Department of Clinical Psychology, CUHK
Leung Yiu Chung	Legislative Council Member
Alice Ling	School Social Work, HK Christian Service

Stephenie Liu	Developmental Paediatrician, HKCNDP
Leslie Lo	Director, Institute of Educational Research, CUHK
Luk Siu Luen	Child Psychiatry, CUHK
Flora Mo	Child Psychiatry, AHNH
Kathy Nicols	Chairperson, F.O.C.U.S.
Daniel Shek	Department of Social Work, CUHK
Shiu Ling Po	Department of Educational Psychology, CUHK
Sin Kuen Fung	HK Institution of Education
Cheryl So	Clinical Psychologist, Yaumatei Child Psychiatric Center
Cecilia Ting	Pathways Foundation
Heidi Tong	Department of Social Work & Social Administration, HKU
Lucia Tsang	Clinical Psychology, Child Assessment Service
Nancy Tsang	Director, Heep Hong Society
Tsang Sandra	Department of Social Work & Social Administration, HKU
Philomena Tse	Paediatrician
Tsui Kwing Wan	Paediatrics, AHNH
Eunice Wong	Paediatrician
Estella Woo	Paediatrician, Child Assessment Service
Winnie Yam	Paediatrician
Anna Yen	Social Work, Caritas St. Joseph Secondary School
Yu Chak Man	Paediatrician, Caritas Medical Hospital
Philip Yuen	Chief Officer (Rehab), HK Council of Social Service

兒童專注力失調 / 過度活躍症

2007 報告書

行政概要

背景

縱然多國在過去數拾年有大量關於專注力失調/過度活躍症 (AD/HD) 的研究、智(知)識和處理經驗，香港對患有專注力失調/過度活躍症人士的認識和支援仍然局限於醫療範疇。最近愈來愈多人認識到學童行為問題乃源於一些需要特殊辨識和幫助的孩童內在因素，如專注力失調/過度活躍症。在 2005 /06 年度『香港康復計劃方案』檢討中，專注力不足/過度活躍症被提出為一個需要多部門關顧及資源的獨特實況，同時被納入計劃中成為一個正規的殘疾類別。

香港兒童腦科及體智發展學會(HKCNDP)為回應政策發展的需要，推動有效及綜合支援系統予有關人士，於 2005 年 11 月份成立一個專注力不足/過度活躍症的工作小組來商議有關事宜。 小組檢視文獻，盤點本土服務系統和專業準備情

況，及草擬建議以應付覺察的挑戰。通過各方諮詢及公開論壇，達成共識而撰寫此立場書。此文將分發至各學術、專業、及執業團體作參考，並提交決策者和執政者作跟進。

何謂專注力失調 / 過度活躍症

定義

專注力失調/過度活躍症 (AD/HD) 乃一來自神經生理差異的情況，會影響個人能力去集中精神、維持專注於工作、或抑制衝動的行為。它的特點在於未能吻合發展情況的專注技巧，及/或衝動魯莽和過度活躍。徵狀多於七歲前開始出現。雖然專注力失調/過度活躍症和特殊學習障礙常出現於同一人仕身上，但專注力失調/過度活躍症不屬於特殊學習障礙的一種。

成因

- 專注力失調/過度活躍症 (AD/HD)被視為一種對抑制衝動和監管工作能力的障礙。集合神經心理、神經顯影和神經化學研究結果顯示額紋狀體網絡 (fronto-striatal network)出現異常。行為遺傳學研究支持專注力失調/過度

活躍症最少會有部份是由家族及遺傳因子所引致。有分子遺傳學研究證據顯示因子 D4DR, DAT1, 5-HTT 和 DRD5 與專注力失調/過度活躍症有強列關連。Faraone, Doyle & Mick et al. (2001) 的研究顯示 DRD4 同專注力失調/過度活躍症確有輕微關連。再者，環境因素和負面的心理因素可能於神經系統發展期間引發異常情況。有資料指出面對問題兒童，或者父母本身患有專注力失調/過度活躍症或其他情緒異常，會引至負面管教方式。對抗性行爲障礙 (Oppositional Defiant Disorder) 或行爲障礙 (Conduct Disorder) 可能部份源於家長的瀆職，但因兩者可能與專注力失調/過度活躍症分負因子遺傳的因素，故它們亦可能部份源於遺傳。

專注力失調 / 過度活躍症有多普遍?

基於診斷準則不同，有關專注力失調/過度活躍症的流行病學研究報告出現差異結果。在美國，兒童病發率約為 3 – 7 百份點；中國為 3 百份點；而其他國家則為 3 – 9 百份點。男女比例約從 2 比 1 至 9 比 1 之間。

專注力失調 / 過度活躍症的處理

診斷

專注力失調/過度活躍症的徵狀本質涉獵多方面，而診斷此症取決於細心查閱兒童成長發展的歷史，垂詢各種臨床徵狀，透過家長報告於家庭觀察或量度之行爲，及在醫療機構所作之行爲觀察和評估。同時亦要留意是否有其他普遍並存的病況，如讀寫障礙和對抗性行爲障礙等。

治療

目前業界的處理指引是利用一個多專業模式，其中包括藥物治療和行爲治療。興奮性藥物已被証實可以顯著地改善專注力失調/過度活躍症的徵狀。行爲改造計劃牽涉孩童、家長及教師，通過界定有問題的行爲作介入點，運用特別技巧去改善目標行爲。家長訓練計劃可幫助他們學習適當技巧來處理孩童的問題行爲。有研究多元化治療的文獻顯示孩童單接受藥物治療或藥物配合行爲治療比那些單接受行爲治療或慣常社區服務的孩童有更大和顯著的改善。

專注力失調/過度活躍症的主要徵狀可能是引致持久學業困難的隱蔽成因，例如不合格或開除學籍等。教育支援包括特別教授策略、行爲處理和課堂調適。有效的家校合作會帶出正面的結果。

整體而言，一個包括教育、行爲、社會和藥物治療的模式，再加上夥拍家庭參與乃目前最具效能和值得選取的治療方法。

社會的承擔

專注力失調/過度活躍症對個人發展的影響可自短期的困難至長遠後果，形成社會要承擔沉重代價。對患者個人而言，他可能有種種問題，包括社交及人際關係、自尊心、學業失敗、就業困難、受傷、意外和濫用藥物。治療專注力失調/過度活躍症已直接涉及高昂的醫療費用，再加上要處理並存的病況，例如行爲障礙和焦慮症及情緒障礙，甚至因患者差勁的專注力或衝動抑制能力而造成交通意外，包括不良駕駛習慣而產生的問題，代價更昂貴。經濟重擔亦加諸其他地方，學校要多撥資源以應付校

本支援服務及特別教育服務的支出，僱主要擔負家長因需照顧有問題子女而缺勤的經濟後果，而患者多因工作表現欠佳而失業，或容易沾上犯罪行徑。因藥物治療可改善孩童的功能，簡接減低家庭及其他人仕的負擔，故藥物治療被視為物有所值。

專注力失調 / 過度活躍症如何應用於華藉人口及香港?

本土流行率

1996 年研究報告在一大群本土男生樣本中發現 6.1 百份點的流行率。年青人當中，估計男孩的流行率為 5.7 百份點而女孩則為 3.2 百份點。根據香港衛生署兒童體能智力測驗服務於 2003 – 2006 年的紀錄，男女比例為 6-8 比 1。

本地研究報告

專注力失調 / 過度活躍症於華人口認可性 (相對專注力失調 / 過度活躍症為一種西方文化獨有的異常) 的研究中，把教師和家長的調查問卷作統計學上的因素分析 (factor analysis)，確證專注力失調 / 過度活躍症行爲與反

社會或情緒化的因素分別隔開；同時亦發現與臨床徵狀、於產前、產中及產後的生理危險、發展遲緩的歷史、及更多神經系統異常跡象有正性的關連系數。這種關連系數並未出現在行為障礙的華人兒童的研究上，代之，他們卻與社會逆境拉上關係 (Leung et al., 1996)。

華人兒童的基因研究發現在漢族兒童中 DRD4 基因的 2R 對偶基因與專注力失調 / 過度活躍症有關連；而 2R 對偶基因可能由 7R 對偶基因演變過來，同時功能又類似 7R 對偶基因。研究又發現 2R 對偶基因會由父母傳遞至其患有專注力失調 / 過度活躍症的子女 (Leung et al., 2005)。

香港華人兒童神經顯影研究，用磁力共振掃描，顯示腦部認為負責專注力及執行工作的地方出現結構性異常 (McAlonan G.M., 2007)。

評估工具包括有 Connors' Teacher Rating Scale 及 Child Behaviour Checklist (CBCL) 『兒童及青少年行為調查問

卷』；CBCL 連同內付之 Teacher report Form 及 Youth Self-Report 曾於香港重建問卷效度，以作本土之用 (Leung et al., 2006)。

治療研究報告包括一個透過家庭、學校和社區合作去幫助專注力失調 / 過度活躍症兒童的『加強學習行為計劃』 (Enhancement of Learning Behaviour Project, So, Leung, & Hung, 2004)，及一個包含藥物治療、親職訓練、兒童訓練和聯絡諮詢學校的多元化治療計劃 (Heung & Ho, 2003; Heung V., 2004)。

香港有何服務?

本地服務

政府政策

雖則各有關部門會在一些嚴重個案中聯絡磋商，惟本地服務大多是由醫療、教育及社會服務機構分別處理。近年來教育及人力統籌局已視專注力失調/過度活躍症為一個有特殊教與需要的類別，同時衛生及福利局亦於 2007 年在復康計劃把專注力失調/過度活躍症包括在殘疾類別之中。

醫療服務

衛生署和醫院管理局屬下各兒童評估中心提供診斷及中期支援服務，而醫院管理局屬下的兒童及青少年精神科服務則提供診斷、治療、長期跟進及支援性專業諮詢予其他醫療及教育機構。部份兒童則接受私人執業服務。

教育支援

主流學校可獲取額外資源及專業幫助以提供支援予教育專注力失調/過度活躍症兒童。支援學習及行爲處理的服務本質和深度則因校而異，差別甚大。

社區服務

現時社區有提供處理專注力失調/過度活躍症兒童的親職訓練計劃。然而有關計劃的專業基礎及成效尚未確證。

香港面臨何種挑戰 及 對將來發展有何建議?

醫療服務

挑戰

兒童及青少年精神科新症輪候時間最近已推延到壹至叁年才獲接見。曾接受專業訓練處理專注力失調/過度活躍症兒童的兒童精神科醫生及兒科醫生嚴重短缺人手。

建議

我們倡議一個四層的醫療分工服務模式：

第一層：非精神科醫療專業人仕

第二層：具處理專注力失調/過度活躍症兒童專門知識的專業團隊，包括接受有關培訓的兒科和精神科醫生，等

第三層：兒童精神科的多專業團隊

第四層：精神科住院服務團隊

上述團隊應在社區和各醫療機構，透過分流及互相轉介，建立一個具協調性的支援網絡。政府應迫切地儘快增加公共服務人手及增強在職培訓各層工作人員。

教育服務

挑戰

大班教學局限了教師向患有專注力失調/過度活躍症兒童提供個別支援服務的範疇。人力資源問題包括缺乏能幫助專注力失調/過度活躍症兒童的專業教師和輔助人員(教師助理)，與及缺乏給予他們具良好素質的訓練。

建議

首要是減少每班學生的人數。當局應系統地編排那些教導專注力失調/過度活躍症兒童的教師接受特殊訓練。學校應聘請具足夠處理專注力失調/過度活躍症兒童知識及技能的輔助人員(教師助理)。學校社工及輔導人員則應獲有關支持和在職訓練。

學校要有效地處理學習和行爲問題，定必要有教師、輔助人員、社會工作者、醫生、臨床心理學家、教育心理學家和家庭各方面的協調與合作。學校應委任一位資深人員統領這個支援團隊，及協調各部門工作。

而學校社工及輔導人員則於此制度下提供個案跟進服務。

社會服務

挑戰

有學者 (Shek & Tsang, 1993) 論證社會服務應以家庭為本，同時應嚴謹考慮照顧此等兒童的家長及人員所肩負的客觀和主觀重擔。縱然香港已推行綜合性家庭服務，惟復康服務與家庭服務之間仍不幸地存着廣濶的空隙。專為家長及家庭成員的需要而設的親職教育訓練計劃和家庭支援服務大致仍然不足。

建議

資源應發放至有關的工作單位，包括提供社區服務的機構及綜合家庭服務中心。社會工作的職前、研究院及在職訓練計劃需改善以覆蓋專注力失調/過度活躍症的處理。發展具證效的社會工作模式並予以推廣至有關兒童及家庭。自助及倡導工作組織應獲專業人仕和有關社工的引導和支持。

服務協調配合

專注力失調/過度活躍症兒童的治療及復康工作端賴多專業及多部門的協調合作。受影響的兒童需接受醫生的處方；心理學家和社會工作者的行爲及情緒治療；教育心理學家、教師們和教師輔助人員提供之有效學校支援；同時家庭可能又接受心理輔導和社交小組訓練。各部門人仕需熟識系統情況以便有效地運作和幫助此等人仕的需要。

專業訓練用以處理專注力失調/過度活躍症兒童

關乎兒科醫生、家庭醫生、兒童精神科醫生、臨床心理學家、教育心理學家、教師、輔助醫療人員及社會工作者於入職前、研究院和在職期間諸般培訓計劃的建議，在本報告作詳細討論。預計約需十年時限才能將目前不足之處提升至合理水平。

公眾教育及研究

我們需要公眾教育讓社會人仕認識專注力失調/過度活躍症兒童及其家庭，正確了解此症的情況及社會支援服務的需要，深入探討其科學及文化因素，以及研究證實治療方法的效能。結果可用作未來政策釐定及服務發展的依據。

結論

通過認識香港兒童及其家庭之文化及生態發展，憑藉各界及多層面的合作和貢獻，再加上有效分流機制及順利分層過渡，復康服務才能向前邁進。社會培訓足量專業人仕，發展證實具療效之服務計劃及夥拍家庭參與皆十分重要。一如其他複雜情況，生理差異、環境和文化會互相磨合影響結果，故發展復康制度需設定界限指標、以便跟進和監察。



**The Hong Kong Society of
Child Neurology & Developmental Paediatrics**
香港兒童腦科及體智發展學會

***Attention Deficit / Hyperactivity Disorder
in Children
2007 Position Paper***

Working Party on AD/HD

Members

Dr. Chan Chok Wan	President, The Hong Kong Society of Child Neurology & Developmental Paediatrics
Dr. Catherine Lam	Council Member, The Hong Kong Society of Child Neurology & Developmental Paediatrics
Mr. Joseph Lau	Senior Clinical Psychologist, Child Assessment Service, Department of Health
Professor Tatia Lee	Professor and Academic Director of Clinical Psychology Programme, University of Hong Kong
Professor Patrick Leung	Professor and Director of Graduate Studies in Clinical Psychology, Department of Psychology, The Chinese University of Hong Kong.
Dr. Stephenie Liu	Senior Medical Officer, Child Assessment Service, Department of Health
Professor Shiu Ling Po	Associate Professor, Department of Educational Psychology, The Chinese University of Hong Kong

This paper was prepared in consultation with

Hong Kong Hospital Authority Child Psychiatry Service Working Group

Dr. LUK Shiu Luen	Adjunct Professor, Department of Psychiatry, Chinese University of Hong Kong; Past Associate Professor, Monash University & Director of Research of Maroondah Hospital CAMHS
Professor Ho Lok Sang	President of the Hong Kong Economic Association; Professor, Department of Economics & Director, Centre for Public Policy Studies, Lingnan University.
Professor Daniel Tan-Lei Shek	Professor Department of Social Work & Director, Quality of Life Centre, Hong Kong Institute of Asia-Pacific Studies, The Chinese University of Hong Kong
Dr. Lee Chi Chiu	Consultant Psychiatrist, Kwai Chung Hospital, Hospital Authority, Hong Kong
Professor Cheng Pui Wan	Assistant Professor, Department of Educational Psychology, The Chinese University of Hong Kong

21 March 2007 Draft Paper Consultation Forum

Participants

Chan Chok Wan	President, HKCNDP
May Chan	Educational Psychologist, Society of Boys' Centres
Eva Chan	Educational Psychologist, TWGH
Chan Kwok Chiu	Paediatrician, AHNH
CB Chow	Paediatrician, CMC
Daphne Blomfield	Pathways Foundation
Daisy Lam	HKU Research Team
Cheng Pui Wan	Department of Educational Psychology, CUHK
Cheung Chiu Hung	Legislative Council Member
Chow Luk Ying Pui	Principal, HCS Memorial School
Ferrick Chu	Equal Opportunities Commission
Ho Lok Sang	Department of Economics, Lingnan University
Hung Chi Hong	HKASLD
Hung Wong Lai Ping	Principal, Caritas St. Joseph Secondary School
Hung See Fong	Child Psychiatry, KCH
Iris Keung	HK Association of Specific Learning Disabilities
Carol Kwong	Principal, HMW Secondary School
Kelly Lai	Child Psychiatry, AHNH
Catherine Lam	Developmental Paediatrician, HKCNDP
Joseph Lau	Clinical Psychology, Child Assessment Service
Clement Law	Chairman, HK Association for AD/HD
Lee Chi Chiu	Psychiatry, YMTCP
Julie Lee	Chairperson, Parents' Association of Pre-school Handicapped Children
Tatia Lee	Department of Clinical Psychology, HKU
Cynthia Leung	HK Institution of Education
Justina Leung	Director, BGCA
Patrick Leung	Department of Clinical Psychology, CUHK
Leung Yiu Chung	Legislative Council Member
Alice Ling	School Social Work, HK Christian Service
Stephenie Liu	Developmental Paediatrician, HKCNDP
Leslie Lo	Director, Institute of Educational Research, CUHK

Luk Siu Luen	Child Psychiatry, CUHK
Flora Mo	Child Psychiatry, AHNH
Kathy Nicols	Chairperson, F.O.C.U.S.
Daniel Shek	Department of Social Work, CUHK
Shiu Ling Po	Department of Educational Psychology, CUHK
Sin Kuen Fung	HK Institution of Education
Cheryl So	Clinical Psychologist, Yaumatei Child Psychiatric Center
Cecilia Ting	Pathways Foundation
Heidi Tong	Department of Social Work & Social Administration, HKU
Lucia Tsang	Clinical Psychology, Child Assessment Service
Nancy Tsang	Director, Heep Hong Society
Tsang Sandra	Department of Social Work & Social Administration, HKU
Philomena Tse	Paediatrician
Tsui Kwing Wan	Paediatrics, AHNH
Eunice Wong	Paediatrician
Estella Woo	Paediatrician, Child Assessment Service
Winnie Yam	Paediatrician
Anna Yen	Social Work, Caritas St. Joseph Secondary School
Yu Chak Man	Paediatrician, Caritas Medical Hospital
Philip Yuen	Chief Officer (Rehab), HK Council of Social Service

Contents	
Executive Summary	1
I. Overview of AD/HD	9
Definition and Clinical Profile	9
Etiology	10
Neurological factors	
Genetic factors	
Environmental factors	
Prevalence rate	15
Diagnosis	15
Management	16
Medical treatment	
Behaviour and emotion intervention	
Educational intervention	
Multimodal treatment	
Complementary and alternative medicine	
Outcome and costs to society	24
II. Hong Kong Scenario	26
Prevalence rate	26
Local studies	27
Validity of AD/HD in Chinese population	
Genetic studies	
Neuroimaging studies	
Studies on assessment tools	
Intervention studies	
Local services for children with AD/HD	31

Government Policies	
Medical services	
Educational services	
Community service and family support	
Challenges & Proposals	34
Medical services	
Challenges	
Proposals	
Educational support	
Challenges	
Proposals	
Support in the community	
Service coordination	
Professional Training	44
Training of doctors	
Current situation	
Proposals	
Training of Clinical Psychologists	
Current situation	
Proposals	
Training of Educational Psychologists	
Current situation	
Proposals	
Training of Teachers	
Current situation	
Proposals	
Training of para-professionals	
Time framework for professional development	
Public education	53
Research on AD/HD	54
Conclusion	54
References	56
Appendix	67

Attention Deficit/Hyperactivity Disorder (AD/HD)

Executive summary

Background

Despite a vast body of research, knowledge and practice experience on AD/HD in many countries over the past decades, Hong Kong's awareness and support systems for persons with AD/HD have been mainly limited to the medical sector. More recently, students with behavioural problems are increasingly recognized as having in-child factors such as AD/HD that require specific identification and help. In Hong Kong's 2005 Rehabilitation Programme Plan Review, AD/HD was brought up as a distinct entity requiring multisectoral attention and resources, and was admitted into the Plan as a formal category of disability.

In response to a need to develop policies that provide effective and integrated systems of support, a Working Party on AD/HD was formed within HKCNDP (appendix 1) in November 2005 to lead deliberations on the subject. The group performed literature review, stock taking of local service systems and professional readiness, and drafted proposals to meet identified challenges. In-depth consultative input to the paper was obtained including from the field of child psychiatry, social work and health economics (appendix 2), and an open Forum was held with key-players and stake-holders on the draft paper (page 3). This final position paper will be issued to academic, professional, and practicing communities for reference, and to policy makers and administrators for further actions.

What is AD/HD?

Definition

AD/HD is a condition with neurobiological origin that interferes with a person's ability to focus and sustain attention on a task, or inhibit impulsive behaviour. It is characterized by developmentally inappropriate attention skills and/or impulsivity and hyperactivity that are maladaptive, persistent and present across different settings, with onset of symptoms occurring before 7 years of age. AD/HD is not a type of specific learning disability although these may occur in the same individual.

Etiology

AD/HD is considered a generalized disorder of impulse control and performance monitoring. Converging neuropsychological neuroimaging and neurochemical studies have implicated fronto-striatal network abnormalities. Behavioural genetic studies support the view that AD/HD is at least partially familial and genetically mediated. Molecular genetic studies show evidence for dopamine D4 receptor (D4DR) gene, dopamine transporter (DAT1) gene, serotonin transporter (5-HTT) gene and dopamine D5 receptor (DRD5) gene to be strongly associated with AD/HD. A meta-analysis by Faraone, Doyle, & Mick et al. (2001) showed the association between DRD4 and ADHD is real but small in magnitude. In addition, environmental factors may play a role through biological compromising events during development of the nervous system or negative psychological factors. It is of note that negative parenting may conversely arise as a reaction to the difficult child as well as parents' own AD/HD and other emotional disorders. Emergence of oppositional defiant disorder (ODD) or conduct disorder (CD) may in part be a result of parental malpractices, but also of partly shared genetic liability of ODD/CD with AD/HD.

How common is AD/HD?

Epidemiological reports on AD/HD vary with variations in diagnostic criteria. Prevalence rates for children are reported as around 3-7% in USA, 3% in China and 3-9% in other countries. Male to female ratio ranges from 2:1 to 9:1.

Management of AD/HD

Diagnosis

Symptoms of AD/HD are dimensional in nature, and the diagnosis of AD/HD hinges on careful developmental history taking that address the full range of symptomatology and current functioning over situational contexts in key domains of family functioning, peer relationships and academic function, and observation of behaviours as reported by adults or measured in home and clinic settings. Common comorbidities such as dyslexia and ODD have to be looked out for.

Management

Current practice guidelines in management involve a multidisciplinary approach including medication and behavioural interventions. Stimulant medication has been shown to significantly improve symptoms of AD/HD. Behavioural modification programmes involve children, parents and teachers. Specific skills are used, and problematic behaviours are identified for intervention. Education programmes for parents are helpful for assisting them to develop appropriate skills for managing disruptive behaviours of their children. The Multimodal Treatment Study showed that children who received medical treatment alone or combined medical and behavioural treatment demonstrated a significantly greater improvement than those who just received behavioural treatment or routine community care.

The core symptoms of AD/HD may be the underlying causes of persistent academic problems such as failed grades and expulsions. Educational interventions include academic instructional strategies, behavioural interventions and classroom accommodations. Positive results occur with effective home and school collaboration.

Overall, an approach involving pharmacological, behavioural, educational, and social interventions in partnership with the family is currently the most efficacious and preferred treatment.

Costs to society

The developmental impact of AD/HD ranges from short-term impairments to long-term sequelae to the individual and severe costs to the family and society. For the individual, there may be serious issues in social interactions and relationships, self-esteem, academic problems and failure, occupational difficulties, injury and accidents and substance abuse. In addition to higher direct medical costs for treatment of AD/HD, there are increased costs for treating comorbidities such as conduct and mood disorders, and costs related to accidents including those as a result of poor driving habits of persons with poor attention and impulse control. Economic burden is also incurred to schools because of increased need for school-based supportive or special education services, to the parents because of missed work for managing the child and its consequent implications to the parents' employers, to the society because of higher association of adults with AD/HD and criminality, and work loss in adults

with AD/HD due to poor performance, and absence from work. Medication treatment of AD/HD has been shown to be cost effective, as it is likely to reduce the overall economic burden of AD/HD by improving the child's function and reducing the direct and indirect costs to families and other third parties.

How does the condition apply to the Chinese population and Hong Kong?

Local prevalence rate

A prevalence rate of 6.1% was found in a large sample of local school boys (Leung 1996). In young adolescents, prevalence estimates are 5.7% for boys and 3.2% for girls. From the records of the Child Assessment Service of the Hong Kong Department of Health, the boys to girls ratio was 6-8 to 1 during the period 2003-2006.

Local Studies

Validity of AD/HD disorder in the Chinese population (versus AD/HD being a culture-bound disorder of the Western culture) was studied. Factor analysis of teacher and parent questionnaires confirmed the presence of AD/HD behaviours separable from anti-social or neurotic/emotional factors, and positive association with external correlates including observed clinical features, higher exposure to biological risks during pre-, peri- and post-natal periods, history of other developmental delays and greater abnormal neurological findings. These correlations were not demonstrated in Chinese children with conduct disorder in whom social adversity was associated instead (Leung et al., 1996).

Genetic studies of Chinese children showed an association between the 2R allele of the DRD4 gene and AD/HD in Han Chinese children, where the 2R allele may be derived from the 7R allele and functions similarly to 7R. In the study, there was a biased transmission of the 2R allele from the parents to their AD/HD children (Leung et al., 2005).

Neuroimaging studies of Chinese children in Hong Kong using a voxel based MRI study showed restricted structural brain abnormalities localized to brain systems known to be necessary for attention and executive function (McAlonan G.M., 2007).

Assessment tools including the Conner' Teacher Rating Scale (1989) and the Child Behaviour Checklist (CBCL) with its Teacher Report Form and Youth Self-Report were re-validated for use in Hong Kong (Leung et al., 2006).

Intervention studies include an Enhancement of Learning Behaviour Project through cooperation between schools, families and community in helping children with AD/HD (So, Leung & Hung, 2004), and a multi-modal intervention project consisting of medication, clinic based parent training, child training and consultation and liaison work with schools (Heung & Ho, 2003, Heung V., 2004).

What is the service situation in Hong Kong?

Local Services

Governmental policies

Local services have been managed largely separately within the medical, education and social sectors, although some liaison efforts have been made in some serious cases. AD/HD is recognized by the Education and Manpower Bureau in recent years as a category of special needs, while the Health & Welfare Bureau's rehabilitation programme incorporated AD/HD as a category of disability in 2007.

Medical services

Child assessment centres of DH and HA provide diagnostic and interim support services, while child and adolescent psychiatric services of HA provide diagnosis, treatment, long-term follow up and consultative support to other medical and educational settings. A proportion of children receive support from the private sector.

Educational support in mainstream schools may be provided with additional resources and professional backend support for students identified with AD/HD. Support for learning and behavioural management varies widely in nature and intensity between schools.

Community programmes on parent skills training for managing children with AD/HD are available. However the nature and effectiveness of these programmes have generally not been validated.

What are Hong Kong's challenges and proposals for future development?

Medical Services

Challenges

Waiting time for Child & Adolescent Psychiatry services have reached 1-3 years recently. Manpower deficiencies, including child psychiatrists and paediatricians trained to manage children with AD/HD, are serious.

Proposals

A 4-tier service model for division of labour among medical professionals is proposed.

Tier One: Non-mental health professionals.

Tier Two: Specialized teams with expertise in AD/HD management.

Tier Three: Child Psychiatry multidisciplinary teams.

Tier Four: In-patient psychiatric care teams.

These teams should work together through triage and mutual referrals as a coordinated network of support in the community and medical settings. In-service training for workers at respective level and opening of posts in public service are needed urgently.

Educational Services

Challenges

Large class size limits the amount of individualized support that teachers could provide to students with AD/HD. Manpower issues include the lack of trained teachers and paraprofessionals (or teaching assistants) for helping students with AD/HD, and the lack of good-quality training provided to them.

Proposals

Reduction of class size is a priority. Specific training should be organized systematically for teachers of AD/HD students. Paraprofessionals (teaching assistants) with adequate knowledge and skills about AD/HD should be employed in schools, and in-service training and support to school social workers and school guidance personnel on this subject should also be provided.

Coordinated services between teachers, paraprofessionals, social workers, educational psychologists, medical doctors, clinical psychologists and families are essential for supporting effective learning and behavioural management in schools. A senior member of the school should be designated to head the support team and coordinate various parties involved. School

social workers and school guidance personnel could provide case work follow through within this system.

Social services

Challenges

It is argued that a family-based approach should be adopted (Shek & Tsang, 1993), and objective as well as subjective burdens borne by the parents or caregivers of these children should be seriously taken into account. Unfortunately, even with the implementation of integrated family services in Hong Kong, the gap between rehabilitation and family service is still very wide. Parenting training programmes and family supportive services geared towards the needs of parents and family members remain grossly inadequate.

Proposals

Resources should be directed to respective operators including community service providers and integrated family service centers. Pre-service, postgraduate and in-service social work training programmes needs to be enriched with respect to coverage of AD/HD management. Evidence based social work practices have to be developed and promoted for these children and families. Peer support and advocacy groups should be guided by professionals who understand their needs and by social workers familiar with peer support group work.

Service Coordination

Multidisciplinary and multi-sectoral collaborations are vital to the treatment and rehabilitation of children with AD/HD. Affected children may be receiving medication by doctors, behavioural and emotional intervention programmes by psychologists and social workers, effective school management by teachers, teachers' aids and educational psychologists, while families may be receiving counseling and social group work attention. All parties should be familiar with the systems in place in order to function and advocate effectively for the needs of these individuals.

Professional training for management of children/students with AD/HD

Recommendations made on pre-service, postgraduate and in-service training programmes for paediatricians and family doctors, child psychiatrists, clinical psychologists, educational psychologists, teachers, para-professionals and social workers are discussed in detail. A time framework of about ten years is envisaged to bring current deficiencies to a reasonable balance.

Public education and Research

Public education is needed for recognition of the presence of children with AD/HD and their families, on accurate understanding of its nature and the community's service needs. Further research on the scientific and cultural aspects of the condition, as well as on effective interventions supported by evidence are critical for guiding policy and service development.

Conclusion

The movement forward will rely on input and cooperation of multiple sectors and levels, with effective triage mechanisms and transitions between levels of care, delivered with understanding of the cultural and ecological context of the children and their families in Hong Kong. The presence of adequately trained professionals, effective programmes supported by available evidence base and partnerships with families in the natural community setting are essential. As for all complex conditions where biological differences, environment and culture interact towards outcome, systems of care have to be developed with parameters that can be followed and monitored.

I. OVERVIEW OF AD/HD

DEFINITION AND CLINICAL PROFILE

Attention Deficit/Hyperactivity Disorder (AD/HD) is the most common neurobehavioural childhood disorder and is among the most prevalent of chronic health conditions affecting school-aged children.

AD/HD was first described by physician Heinrich Hoffman in 1845, but it was not until 1902 that the medical community studied the characteristics of this condition. Different operational definitions have been used throughout the decades. Currently, the American Psychiatric Association's Diagnostic and Statistical Manual and the World Health Organisation's International Classification of Diseases and Related Health Problems, in their latest versions, DSM-IV and ICD-10 have come to an almost identical operational definition of AD/HD with a set of 18 core symptoms (Appendix Box 1 & Box 2).

AD/HD is characterized by persistent symptoms of inattention, hyperactivity and impulsivity across situations. Onset of symptoms occurs before 7 year old although many individuals are diagnosed after the symptoms have been present for a number of years. These symptoms incur significant psychosocial impairment including difficulties in family functioning, peer relationship, and school functioning. The associated behavioural problems are excessive, long term and pervasive. Children with AD/HD are often unable to sit still, plan ahead, finish tasks or follow what is going on around them. They are perceived as disorganized and difficult to look after or to control. They appear to be well behaved at times, but lack consistency in their performance. People around them might not be aware that they have difficulty in controlling their own behaviours. A significant proportion of children with AD/HD (40 – 50%) also suffer from co-morbid conditions including Oppositional Defiant Disorder, Conduct Disorder, Bipolar Disorder, Anxiety and Mood Disorders, Tic Disorder and Learning Disorders (Szatmari, Offord and Boyle 1989). In the long term, if AD/HD is not recognized early in its course during childhood, psychosocial problems such as academic difficulties, self-esteem issues, family problems, increased risk of accident and injuries will develop affecting adjustment in adulthood. Studies showed that as many as 80% of diagnosed hyperactive children continue to have

features of AD/HD persisting into adolescence, and up to 65% into adulthood (Dulcan & Benson 1997). Some of the most common symptoms displayed by individuals with AD/HD in adulthood include losing and quitting jobs frequently, history of academic and/or career underachievement, poor ability to manage day-to-day responsibilities (e.g., completing household chores or maintenance tasks, paying bills, organizing things), relationship problems due to forgetting important matters or getting easily upset over minor ones, chronic stress and worry due to failure to accomplish goals and bad driving record due to inferior impulse control. Some very bright and talented individuals, however, are able to compensate for their AD/HD symptoms and do not experience significant problems until high school, college, or during pursuit of their careers. The difference between adults with and without AD/HD is one of degree. “These symptoms occur among these people far more frequently than they do among the rest of us and the duration of the symptoms are so severe that they impede their progress in life,” R.A. Barkley said. The results of prospective follow-up studies of children with AD/HD into adolescence and adulthood indicate significantly higher rates of grade retention, placement in special education classrooms, and dropping out of school relative to their peers (Barkley and Fischer et al., 1990). It is believed that those cases receiving timely treatment will develop fewer primary and secondary difficulties later in life.

ETIOLOGY

The aetiology of AD/HD is still to be fully elucidated, but findings are consistent with a multi-factorial hypothesis.

Neurological factors

AD/HD has been considered to be a generalized impulsivity disorder that presents with deficits in multiple domains of functioning. Impulse control and performance monitoring are executive functions of the human brain (Menon et al., 2001), abilities considered critical for intelligent behaviours. Efficient impulse inhibition requires a cognitive system that is capable of inhibiting habitual responses, in order to orchestrate behavioural outputs in accordance with intentions and situational demands (Miller, 2000). The neural correlates of impulse control have been extensively studied by functional imaging technology, e.g. functional magnetic resonance imaging (fMRI) (Huettel et al., 2004) and positron emission tomography (PET) (Wong et al., 1986). The technology allows researchers unique avenues for viewing the activities

of the brain regions associated with cognitive inhibition. The frontal regions, particularly the prefrontal cortex (PFC) and the anterior cingulate cortex (ACC) are found to work closely together for impulse control. Activation of the ACC is probably related to the selection among competing response alternatives (Carter et al., 1998; Pardo et al., 1990), as well as to the inhibition of previously learned rules and the self-monitoring of random errors (Amos, 2000), which is essential to the inhibition of habitual responses. Furthermore, the ACC appears to monitor signals that serve to up-regulate the processes within the PFC and to process tasks that a non-habitual response is required. Such a circuit may also exercise top-down influence for the functioning of voluntary control of behaviour and thought, self-regulation, and consciousness (Posner & Digirolamo, 1998; Posner & Rothbart, 1998). Lee et al. (2001) in their fMRI study of the neural correlates of impulse control and behavioural regulation observed that both lateral PFC and ACC were associated with the cognitive process of inhibition and response regulation. The imaging data reported thus far are consistent with evidence of the role of the prefrontal cortex (PFC) in inhibitory mechanisms comes from a number of animal and human studies (e.g. Buchkremer-Ratzmann and Witte, 1996; Malloy et al., 1993; Collette et al., 2001). They also match closely with the speculations laid by previous behavioural studies (e.g. McCarthy et al., 1997; Kirino et al., 2000). Lesion studies further confirmed that damage to the lateral PFC is associated with impaired selection of plans for behaviour. Such cases are unable to choose between possible alternatives, preferring well-practiced behaviours regardless of context (Lhermitte, 1986a, 1986b; Mesulam, 2002; Petrides and Pandya, 2002). In studies on children with AD/HD, they were found to have abnormal activation patterns during attention and inhibition tasks in the right prefrontal region, the basal ganglia (striatum and putamen), and the cerebellum (Rubia et al., 1999; Teicher et al., 2000).

Anatomically, in the largest neuroimaging study of AD/HD to date, Castellanos and colleagues (2002) reported that people with AD/HD have a reduction in volume of total brain white and grey matter, and in the caudate, frontal, temporal and cerebellar regions from an early age. Study using newer techniques such in which every volume-element of whole brain is assessed (voxel-based) has reported predominantly right hemispheric grey matter deficits in basal ganglia, superior frontal gyrus and posterior cingulate (Overmeyer et al., 2001).

Neurotransmitter dysfunction or imbalance (principally among the monoamines, including dopamine and norepinephrine) has also been postulated to occur in individuals with AD/HD based on the observations of the beneficial effects of

stimulants on hyperactive (Bymaster et al., 2002; Kirley et al., 2002).

Converging neuropsychological, neuroimaging and neurochemical studies have generally implicated fronto-striatal network abnormalities as the likely cause of AD/HD.

Genetic factors

Increasing evidence also supports the view that AD/HD is at least partially familial and in part genetically mediated. Twin studies reported concordance rates for AD/HD ranged from 51% to 80% for monozygotic twins versus 29% to 33% for dizygotic twins (Gilger, Pennington, & Defries, 1992; Goodman & Stevenson, 1989; Sherman, Iacono, & McGue, 1997). Heritability estimates for individual symptom domains (hyperactivity and inattention) obtained from twin studies show a high degree of support for the influence of genes. The heritability of hyperactivity has been calculated to be between 64% and 77%, and that of attention-related behaviours to be between 76% and 98% (Goodman & Stevenson, 1989).

Newly added molecular genetic materials

Given such high heritability estimates, AD/HD is a sure target for molecular genetic studies. Since it is considered to be a complex disorder, multiple genes of mild-to-moderate effects are likely to be involved. Since 1991, there have been over 100 genetic studies, including three genome-wide scans and over 30 candidate genes studied (Bobb, Castellanos, Addington & Rapoport, 2006). Most of the candidate genes studied have been implicated through psychopharmacological, neurobiological, or animal models.

So far, relatively stronger evidence for association exists for four genes in AD/HD: *the dopamine D4 and D5 receptors, and the dopamine and serotonin transporters. Dopamine receptor D4 (DRD4) gene is the most replicated gene in the field - its 7-repeat allele in exon 3 being found to be associated with AD/HD. The association of the 10-repeat allele in exon 15 of dopamine transporter (DAT1) gene with AD/HD comes second as the most replicated findings in studies. The finding that the long allele of the 44-bp insertion/deletion in the promoter region of the serotonin transporter (5-HTT) gene confers risk for AD/HD comes third in its replication in the field. Finally, there are also some associations found between different polymorphisms/alleles of dopamine receptor D5 (DRD5) gene and AD/HD, e.g., the*

(CA)_n repeat in the 5' UTR. Meta-analyses have reported respective odds ratios of 1.9, 1.2, 1.3, and 1.2 for the four genes in association with AD/HD (Bobb et al., 2006). Other genes which show promise but require more replication are the *dopamine D2 (DRD2)* and *serotonin 2A receptors (5-HT2A)*. A meta-analysis by Faraone, Doyle, & Mick et al. (2001) showed the association between DRD4 and ADHD is real but small in magnitude.

Thus, besides high heritability estimates obtained from behavioural genetic studies with twins, there is growing evidence from molecular genetic studies that pinpoint certain genes, indicating AD/HD as a disorder with a significant genetic component.

Environmental factors

As the twin and quantitative genetic studies suggest, the environment may play some role in individual differences in symptoms of AD/HD; however, these may involve biological events as well as psychological factors.

Biological events may include prenatal, perinatal and postnatal complications and malnutrition, as well as diseases, trauma, and other neurologically compromising events that may occur during the development of the nervous system before and after birth. Pregnancy complications, especially maternal smoking and alcohol abuse, low birth weight and associated minor brain haemorrhaging were found to have long-lasting effects on cognition and behaviour of a child, although the relative mechanisms mediating the effects of these events remain undetermined (Linnet et al. 2003; Milberger, Biederman, Faraone, Chen and Jones (1996)); However, the contribution of maternal stress and anxiety during pregnancy are arguable.

Elevated body lead burden during the first 2-3 years of child development has been shown to have a small but consistent and statistically significant relationship to the symptoms constituting AD/HD. However, even at high levels of lead, fewer than 38% of children are rated as having the behaviour of hyperactivity on a teacher rating scale (Needleman et al 1979), implying that most lead-poisoned children do not develop symptoms of AD/HD. And most children with AD/HD, likewise, do not have significantly elevated lead burdens. Studies have found the associated between body lead and symptoms of AD/HD to be 0.10 – 0.19 (Fergusson 1988, Silva 1988, Thomson 1989). These studies suggested that their lead levels explain no more than 4% of the variance in the expression of these symptoms in children with elevated lead.

Psychological factors and some environmental theories have been proposed to be the cause of AD/HD before. They included poor parental management of the children resulting in poor stimulus control and poor regulation of behaviour (Willis and Lovaas 1977); difficulties in parents' overstimulation approach to caring for and managing children as well as from parental psychological problems (Carlson 1995). However numerous twin studies conducted today have failed to show a significant contribution of rearing or common environment to the behaviours that constitute AD/HD. However, despite the large role heredity seems to play in AD/HD symptoms, they remain malleable to unique environmental influences and non-shared social learning. The actual severity of the symptoms, their continuity over development, the types of secondary symptoms and the outcome of the disorder are related in varying degrees to environmental factors (Biederman 1996, Milberger 1997, van den Oord 1997, Weiss 1993). Yet, care must be taken in interpreting these findings as evidence of a pure environmental contribution to AD/HD. It is because the genetic contribution to the family environment, the presence of symptoms and disorders in the parents similar to those evident in their children, are facts that often go overlooked. Studies on parent child interaction also showed that much of the negative behaviour of the mothers appeared to be in response to the difficult behaviour of these children, and that medication resulted in significant improvement in children's hyperactivity and compliance, followed by improvement of parenting behaviour (Barkley 1979, 1984, 1985). Taken together, these findings suggested that the overly critical, commanding and negative behaviour of mothers of hyperactive children is most likely a reaction to the difficult, disruptive, and noncompliant behaviour of these children rather than a cause of it. The disrupted parenting many also arise from the parents' own AD/HD and other psychological disorders, such as depression, anxiety, and antisocial behaviours/ personality. Studies also showed that the continuation of hyperactive behaviour over the years, especially oppositional behaviour in these children, are related in part to parents' use of commands, criticism, and an over-controlling and intrusive style of management. All these tell us that comorbid ODD/CD in children with AD/HD may in part be a result of parental management practices, it does not mean that a child's AD/HD is a result of those practices. Indeed, recent twin studies suggest that the high association of AD/HD with ODD/ CD is likely to be the result of a shared genetic liability for these two disorders, with ODD/CD also being influenced by additional genetic factors (Nadder 2002). Theories of the causation of AD/HD can no longer be based solely or even primarily on social factors, such as parental characteristics, caregiving abilities, child management or other family environmental factors (Barkeley 2006).

Other environmental factors such as cultural contribution and TV viewing during early childhood contributing to symptoms of AD/HD have not been well established.

PREVALENCE RATE

Over the past decades, the prevalence rates of AD/HD have increased, but they vary substantially with the changing diagnostic criteria over time. In the USA, the prevalence rate is reported to be around 3-7% in school age children (Barkley, Fischer, Edelbrock, & Smallish, 1990). Prevalence rates in other countries have been reported to be between 3% and 9.5%, roughly analogous to U.S. data (Gingerich et al., 1998). Studies of Chinese school children have reported prevalence rates of AD/HD ranging from 1.3 to 13.6% depending on the assessment instrument utilized. Based on the DSM-III diagnostic requirements, 3% of primary school children in China were said to meet the diagnosis (Tao, 1992). The disorder is more frequent in males than in females, with male-to-female ratio ranging from 2:1 to 9:1, depending on the subtype and setting.

DIAGNOSIS

Early diagnosis and intervention of children with AD/HD is key to the success of management of this group of children. As AD/HD symptoms are clearly dimensional in nature, the clinician is concerned with a constellation of excessive and inappropriate symptoms that significantly interferes with child's ability to function at home, in school or with friends. Thorough diagnostic assessment and comprehensive treatment are needed to address its full range of symptomatology and associated problems. To facilitate diagnostic formulation, thorough clinical assessment is needed to gather information not only for ascertainment of the diagnosis of AD/HD, but also for differentiation of the presenting problems from other psychiatric disorders, presence/absence of other co-occurring psychiatric disorders, and identification of risk and protective factors for the child and the family. Because the definition of AD/HD is currently a behavioural one based on the individual's functioning in daily life, assessment procedures must focus on the observable behaviours as reported by adults or otherwise measured in natural (home and classroom) and clinic settings. Three areas of psychosocial impairments common in children with AD/HD—difficulties in family functioning, peer relationships and academic functioning—are predictive of negative long-term outcome and they should

be treated as key assessment domains. There is as yet no single test or measure for the disorder. Screening for AD/HD is most efficiently accomplished with parent and teacher rating scales. A clinical interview is essential to assess the development and current functioning of the child. Also the assessment should obtain information about onset and rule out co-morbidities, such as dyslexia, oppositional defiant disorder, anxiety disorder and tics. The clinician should evaluate the child's functioning in key domains of peer, parent and teacher relationships, academic progress, the classroom and the family. Clinicians are likely to miss out "inattentiveness" as the primary symptom in AD/HD children. They are not "hyper" but are often sluggish and lethargic, have serious difficulties in sustaining, focusing and shifting their attention to tasks. We should recognize that some children suffer from chronic problems of inattention without any significant hyperactivity.

In sum, the diagnostic process of AD/HD is complicated in several ways. The manifestations of the symptoms vary with age of the child, situational contexts, co-occurring disorders and associated impairment. Such variability will affect the accuracy of the description of the child's behaviour by different informants. Data gathered from the diagnostic interview and behaviour rating scales are also subject to bias or error arising from the informant's mental state or beliefs about the disorder. It is important to weigh symptoms by their severity and significance, not just counting them, when assessing impairment. The constructs of executive dysfunction and frontal lobe functioning have played prominent roles in discussions of the core deficit in AD/HD. However, reliable markers of AD/HD are yet to be demonstrated.

MANAGEMENT

Aside from supporting diagnostic formulation, thorough clinical assessment can facilitate the formulation of a comprehensive treatment plan by addressing the impacts of AD/HD on a child's life (e.g., cognitive and social development, family circumstances), the child's and parent's belief about the disorder and attitude toward the treatment options, and previous treatment responses if applied. Current practice guidelines suggest a multidisciplinary approach (Hill & Taylor, 2001) in which stimulant medication is an integral part. Intervention involves the individual, family, parent and teachers. Remediation of social skills to improve interpersonal interactions, and coaching to improve organization and study skills, are also useful adjuncts to treatment. The needs of children with AD/HD are typically not addressed within one setting. One of the most crucial aspects of treatment planning is to establish alliance

with the parents, the patient, and in some cases, the school, sufficiently to permit consistent implementation of specific treatment interventions across settings. Psycho- educational interventions are also of paramount importance.

Medical treatment

Medical treatment with stimulants is now considered the first-line treatment for children and adults with AD/HD based on the extensive efficacy and safety data of the stimulants (Greenhill & Osman, 1999, and the MTA cooperate group 2004). According to an American Medical Association Report, more than 170 studies involving more than 6000 children using stimulant medications for AD/HD show that stimulant medications significantly improve symptoms of AD/HD for up to 75 % of those who are treated (Swanson et al., 1993; Spencer et al, 1996).

Stimulants are sympathomimetic drugs that increase intrasynaptic catecholamines (mainly dopamine) by inhibiting the presynaptic reuptake mechanism and releasing presynaptic catecholamines. The most commonly used stimulants include methylphenidate (Ritalin, Concerta) and amphetamine (Dexedrine, Adderall). Common unwanted effects of stimulants include appetite suppression (which may lead to weight loss), mild sleep disturbance, and irritability. Long acting stimulant medication is preferred. As a result, the child only needs to take the medication once a day, which will remove the trouble of giving medications at school and reduce the stigma attached to taking medication. Children often refuse to take the medication at school because they feel being singled out.

Selective norepinephrine reuptake inhibitor (Atomoxetine) is the medication to be considered for those cases who do not response well to stimulants. Other indications include unacceptable side effects from first line drugs, presence of significant tics, severe oppositional behaviour, and the risk of substance abuse. Other medications include Tricyclic antidepressants (Imipramine, Amitriptyline, Desipramine) and α -adrenergic agonists (Clonidine, Guanfacine).

Despite the effectiveness of stimulant medications, local parents usually display a great resistance to their use. It may be due to a lack of understanding how the medication works, unrealistic fears of the side effects of medication including poor growth and drug dependence, and unfavorable reactions from other family members or other people who are providing care to the child. Hence, an important aspect of treatment for AD/HD is education of the patient, family, the school and the

community about the nature of the disorder and how it can be treated.

Behavioural and emotional intervention

In behavioural modification programmes, parents, teachers and children need to learn specific skills from professionals who are experienced with the approach that can improve these children's behaviour. Intervention programmes for both parents and children should be carried out at the same time for best results. Parent training can be conducted either in groups or with individual families. Individual sessions are often implemented when a group is not available or when the family would benefit from a tailored approach that includes the child in sessions. The number of sessions varies depending on the severity of the problems (typically ranging from 6 to 16 sessions).

Typically, a mental health professional, often a psychologist, begins with a complete evaluation of the child's problems in daily life, including home, school and social settings. The evaluation would result in a list of target behaviours, i.e. behaviours in which change is desired. Target behaviours can be either negative behaviours that need to stop or new skills that need to be developed. This means that areas targeted for treatment will often not be the symptoms of AD/HD – overactivity, inattention and impulsivity – but rather specific problems that those symptoms may cause in daily life. Common target behaviours in the classroom include 'completes assigned work with 80 percent accuracy' and 'turns in an assignment on time'. At home, 'plays well with siblings (no fights)' and 'obeys parent's commands on request' are common target behaviours. After target behaviours are identified, similar behavioural interventions are implemented both at home and at school. Parents and teachers learn and establish programmes in which the environmental antecedents and consequences are modified to change the child's targeted behaviours. Treatment response is constantly monitored through careful recording and observation, and the interventions are modified when they fail to be helpful or are no longer needed. Clinical or educational psychologists, by training, are well versed in the principles and skills of behaviour modification in changing human behaviour.

Parent training programmes are important in assisting parents to develop appropriate skills to manage disruptive behaviours of their children with AD/HD. Some general principles of parenting have shown to be useful. They include provision of more frequent and immediate reinforcement, setting up of more structured guidelines in anticipation of potentially problematic situations, and provision of greater supervision and encouragement to children in relatively unrewarding or tedious situations. Studies

involving preschool children with AD/HD and their families have shown that parent training can lead to increased child compliance and improvements in observed parenting skills (Anastopoulos, DuPaul, & Barkley, 1991; Pisterman, McGrath, Firestone, & Goodman, 1989).

On emotional aspects of these children, Braaten and Rosen (2000) felt that children with AD/HD appear to be less empathic than those without AD/HD. In addition, children with AD/HD appear to show more negative emotion, particularly depression, anger, and guilt, than do children without AD/HD. Since negative affects are more socially unacceptable and thereby produce more salient, long-term negative social consequences for the individual relative to the positive emotions, it is inevitable that children with AD/HD are at a particular disadvantage in their academic, emotional, and psychosocial development. Indeed, Sukhodolsky et al. (2005) suggested that impairments of school, social, and emotional functioning might be associated with AD/HD. Barkley (1990) commented that children with AD/HD constitute the greatest number of referrals to child guidance clinics in the US. Proactive services for addressing the emotional needs of AD/HD children should thus be in place.

In 2002, the World Psychiatric Association (WPA) Presidential Programme on Child Mental Health was launched to develop a comprehensive set of tools to address countries' needs for a systematic, evidence-based approach to address child and adolescent mental health problems. An Integrated Services Programme (ISP) was set up under this Programme and developed by a task force of international experts. A treatment manual for externalizing disorders (i.e., Attention-Deficit/Hyperactivity Disorder, Oppositional Defiant Disorder, Conduct Disorder) was developed and implemented in various countries (So et al., 2005). The manual, adapted from previous evidence-based manuals, was purposely intended to be brief, 8-12 sessions, and involve both the child and parents in treatment activities. The manual was drawn from the current literature of evidence-based interventions (Arnold et al., 1997; Barkley, 1997; So et al., 2004).

Scientific data from the last four decades indicate that stimulant medication, behaviour therapy (for the child and parents), and behaviour modification in classroom settings are evidence-based treatments for AD/HD. However, treatment effectiveness for each child is greatly impeded or facilitated by various factors including the quality of medical/psychosocial management, treatment adherence, collaboration between different professionals, and variations in the life of each child and the family. Consequently, highly specialized professionals are required to conduct

thorough clinical assessment, formulate a comprehensive treatment plan, provide evidence-based treatments, and monitor treatment progress.

Educational intervention

Studies found that students with AD/HD often had persistent academic problems such as low average marks, failed grades, expulsions or dropout from school, and a low rate of graduation from college (Weiss & Hechtman as cited in Johnston, 2002; Ingersoll, 1988). A study by Barkley and colleagues (1990b) found that 46 percent of their students with AD/HD had been suspended and 11 percent had been expelled. Each of AD/HD's core symptoms—inattention, hyperactivity, and impulsivity—may be the cause of failures in school. Difficulty sustaining attention to a task may result in missing important details in assignments, daydreaming during lectures and other activities, and difficulty organizing assignments. Hyperactivity may be expressed in either verbal or physical disruptions in class. Impulsivity may lead to careless errors, responding to questions without fully formulating the answers, and only attending to activities that are entertaining or novel (Zentall, 1993). Overall, students with AD/HD experience more problems with school performance than their non-affected peers.

As a result, the classroom should be a major context in which treatment of AD/HD problem behaviours takes place. It has often been found that treatment effects established in the clinic do not transfer to other contexts, including the school. According to Barkley (2004), “treatments for AD/HD will be most helpful when they assist with the performance of a particular behaviour at the point (place and time) of performance in the natural environments where and when such behaviour should be performed.” Therefore, it is only reasonable that children with AD/HD also receive treatments in their schools.

Educational interventions consist of three components: academic instruction; behavioural interventions; and classroom accommodations.

Academic instruction. Research in the past thirty years has identified a number of effective evidence-based instructional practices for helping children with AD/HD. They include both general instructional strategies and individualized instructional practices. Students with AD/HD learn best with carefully structured lessons. Effective teachers preview their expectations about what students will learn and how they should behave during the lesson. Children with AD/HD may have different ways of learning than traditional reading and listening. Effective teachers first identify areas in which each child requires extra assistance and then use special strategies to provide structured

opportunities for the child to review and master an academic lesson that was previously presented to the entire class. Strategies that may help facilitate this goal include the following: reducing noise levels, structuring classrooms formally as opposed to informally, seating students with AD/HD in front seats, and providing frequent breaks between learning tasks. Providing written instructions, breaking tasks into smaller steps, and using visual aids can be helpful. Brief directions given in a firm, calm manner with teacher proximity also maximize the extent to which students with AD/HD respond positively to the teacher. Many AD/HD students are easily distracted and have difficulty focusing attention on the tasks at hand. They need to be trained to use organization skills in managing homework and other daily assignments. Students with AD/HD often have difficulty finishing their assignments on time and need to be assisted with practice on time management skills.

Behavioural interventions. The second major component of effective educational interventions for children with AD/HD involves the use of *behavioural interventions*. Children with AD/HD often act immaturely and have difficulty learning how to control their impulsivity and hyperactivity. They may have difficulty thinking through the social consequences of their actions and may have problems forming friendships with other children in the class. Behavioural interventions may be used to assist students to produce behaviours that are conducive to their own learning and that of their classmates. Providing behaviour consequences, setting clear goal structures and task elements, altering antecedent task and environmental conditions, and providing modeling and additional practice have been found very useful for this purpose (Zentall, 2005). The optimal classroom is one with moderate but consistent discipline, clear expectations, frequent rewards for progress, and positive reinforcement for positive behaviour and impulse control.

Classroom accommodations. The third component of effective educational interventions for children with AD/HD involves physical *classroom accommodations*. Children with AD/HD often have difficulty adjusting to the structured environment of a classroom, determining what is important, and focusing on their assigned work. They are easily distracted by other children or by nearby activities in the classroom. As a result, many children with AD/HD benefit from accommodations that reduce distractions in the classroom environment and help them to stay on task and learn. Simple accommodations within the physical and learning environments of the classroom such as sitting close to the teacher or a role model can benefit children with AD/HD. Skilled teachers also use special instructional tools to modify the classroom learning environment and accommodate the special needs of their students with AD/HD.

Co-operation between school and home

Numerous studies have found that positive results occur when the major stakeholders in a student's education collaborate to address a child's problems (Blazer, 1999; Bos, 1999; Bos, Nahmias, & Urban, 1999; Nahmias, 1995; Williams & Cartledge, 1997). Effective collaboration and communication between home and school provide structure across the two major settings in the child's life. Common rewards, reinforcement strategies, and language help to promote consistency across settings.

Bos et al. (1999) reported that collaborative partnerships between home and school were especially important during the initial assessment of the child's disability and educational needs, the development of behaviour modification plans, the evaluations of medication, and the coordination of assignments. Parents and teachers can share information with one another if they work together to plan behavioural and academic strategies for the student. Parents can offer information about the child—including the child's medical history, hobbies and interests, reinforcers that are effective for this child, and behaviour in other settings—that may inform the decisions made by the teacher and other members of the individualized educational planning (IEP) team. The teacher can keep parents informed about their child's progress, performance, and behaviour in school. If the child is taking medication, the teacher can offer feedback to parents on how the medication affects the student's performance and the duration of the medicine's effectiveness. This information also can be used to help medical professionals make more informed decisions about the child with AD/HD.

Multimodal treatment

The multimodal treatment of AD/HD often involves all the above medical, behavioural and educational interventions. This comprehensive approach consists of parent and child education about diagnosis and treatment, behaviour management techniques, medication, and school programming and supports. The severity and type of AD/HD may be factors in deciding which components are necessary.

The Multimodal Treatment study of children with AD/HD (MTA Cooperative Group, 1999a) was a collaboration of six independent research teams in North America. It studied 579 children (80% males), age 7 to 9.9 years in the United States and Canada, receiving treatment for 14 months. It showed that children who received medical treatment alone or combined medical and behavioural treatment demonstrated a significantly greater improvement in most AD/HD symptoms than those who just

received behavioural treatment and routine community care. The behavioural component of combined treatment improved non-AD/HD symptoms such as social skills and parent-child relations, and is associated with positive functioning outcomes. Similarly, parent training (which includes positive parental attention and rewards for the child's appropriate behaviour) when combined with medication, decreased oppositional behaviour and enhanced parent-child relations more than medications alone. Overall, it seems that an approach involving pharmacological, behavioural and educational interventions with home-school partnership is currently the most efficacious and preferred treatment for the child with AD/HD. A related issue is that due to the chronic nature of AD/HD, children with AD/HD might need repeated episodes of multi-component treatment over the course of their life and that their progress should be monitored (Barkley, 1998). Whether all or some of the components of treatment will be used for a child and the family will depend on their needs at the time. A follow up of the MTA study showed that the MTA medication strategy showed persisting superiority over behavioural treatment and community care in AD/HD and ODD symptoms at 24 months follow up, although not as great as 14 months. Significant additional benefits of combined management over medication management, however, was not found (MTA Cooperate Group, 2004).

Complementary and alternative medicine

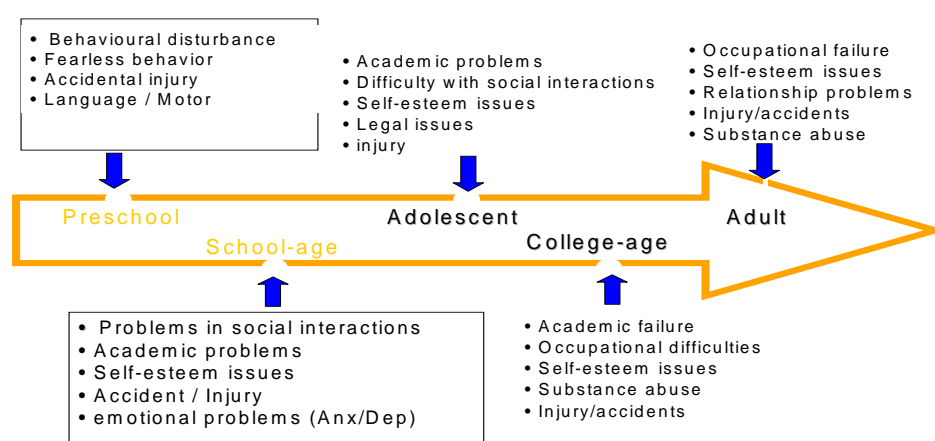
Other treatment options claim to alleviate impairments of AD/HD. In certain cases, the claim for efficacy has not received endorsement according to standards held by the scientific community. These include EEG biofeedback, megavitamins and other nutritional supplements, dietary intervention, sensory integration training, and exercise treatment. Dietary treatments include eliminating one or more foods in a patient's diet (e.g., sugar, candy and food with red dye). The concept involves sensitivity to certain foods, which in turn causes symptoms of AD/HD. Despite a few positive reports, most controlled studies do not support this hypothesis (Arnold, 2002). Nutritional supplements and large doses of vitamins, believed to be deficient in the diet, are recommended to be added to the child's intake. Scientists have yet to find support for these recommendations. Sensory integration (SI) training is not recognized as a treatment for AD/HD. Some pediatricians and occupational therapists feel that SI dysfunction is a possible associated finding in some children with AD/HD. However, further studies have to be done to ascertain the relationship between SI dysfunction and symptoms of AD/HD. EEG biofeedback is a suggested intervention for AD/HD, based on findings that individuals with AD/HD may show low levels of arousal in frontal brain areas. In biofeedback treatment, individuals

with AD/HD are taught to increase arousal levels in these regions to levels more similar to those found in those without AD/HD. Well-controlled large groups studies have yet to be done to support the effectiveness of this treatment. A programme of individualized exercises purported to improve “cerebella developmental delay” is claiming to alleviate dyslexia and attention deficit disorder. There is as yet no scientifically recognized and peer reviewed evidence to support these claims for treatment of AD/HD.

OUTCOME AND COSTS TO SOCIETY

AD/HD is a complex psychiatric disorder caused by heterogeneous factors (i.e., genetic, biological, psychosocial) and complicated by various co-occurring psychiatric disorders and a range of short-term impairments and long-term sequel resulting in personal sufferings and severe cost to the society (see Figure below).

Developmental Impact of ADHD



A growing body of literature, primarily published in the United States, has demonstrated that AD/HD places a substantial economic burden on cases, families, and third party payers. The economic implications included direct treatment costs, increased rates of co-morbid psychiatric disorders, high accident rates, work loss, criminality, and cost to the family (Appendix Box 3)

Results on the medical cost studies consistently indicated that children with AD/HD had higher annual medical costs than either matched controls (difference ranged from US\$ 503 to \$1,343) or non-matched controls (difference ranged from US\$ 207 to \$1,560) without AD/HD (Matza, Paramore & Prasad, 2005). The costs of AD/HD to families include financial cost of medical treatment of child, indirect costs of parents include efforts to manage the child, strain to parent child interaction and marital

relationships, high parental stress (physical and mental), missed work and the implication to parents' employer. Costs of criminality include the fact that childhood AD/HD is associated with criminality in adolescence and adulthood. Children with AD/HD were found to have higher juvenile and adult arrest rates, and adolescents with AD/HD were more likely to be on probation, in jail or assigned to a social worker by the court. The mean total criminal costs were dramatically greater for AD/HD cases than for controls (\$12,868 versus \$498). The costs of co-morbidities are due to the fact that children with AD/HD tend to have elevated rates of other psychiatric conditions such as oppositional defiant disorder, conduct disorder, anxiety disorder, depression and bipolar disorder, and learning disabilities. These co-morbid disorders substantially increase the costs of treating children with AD/HD. The costs of accidents are due to the fact the cases with AD/HD are more accident prone and more likely to experience injuries as a result. Among adults, the accident-specific direct medical costs were significantly higher among individuals with AD/HD than among the control group (\$642 versus \$ 194). In a study comparing persons with and without AD/HD, those with AD/HD were more likely to have diagnoses in multiple categories including major injuries. The proportion with any hospital inpatient, hospital outpatient, or emergency department admission was higher for persons with AD/HD, and the 9-year costs for persons with AD/HD compared with those without AD/HD were more than double (\$4,306 vs \$1,944) (Leibson C.L., Katusic, S.K., Barbaresi W.J., Ransom J. and O'Brien P.C. 2001). The costs of work loss in adult with AD/HD is due to poor job performance, lower occupational status, less job stability, and increased absence days when compared to control. The excess costs related to work loss (i.e. difference between adult AD/HD cases and matched controls) were \$1.20 billion for women with AD/HD and \$ 2.26 million for men with AD/HD (Matza, Paramore & Prasad, 2005) .

In addition to the above, there are many other well-documented outcomes of AD/HD with economic implications. One example is the detrimental effects of AD/HD on a child's academic performance and behaviour in school, which place additional economic burden on the school. There may be increased need for school based supportive services, special education services, child and parent counseling, efforts to address disruptive behaviours, and efforts to develop individual educational programme. Another example involves poor driving habits of adults with AD/HD causing high rates of traffic accidents. All these economic burdens to third parties are serious and need close examination.

The research on cost effectiveness of treatment of AD/HD, primarily focused on the use of stimulant (methylphenidate), generally indicated that treatment of AD/HD is cost effective. The cost effectiveness ratios ranged from US\$ 15,509 to \$27,766 per quality adjusted life year (QALY) gained, an outcome measure that incorporates quality of life benefits and time (Matza, Paramore & Prasad, 2005). It indicates that effective treatments, while possibly increasing direct medical costs, are likely to reduce the overall burden of AD/HD by controlling symptoms, improving children's functioning, and substantially reduce indirect costs to families and other third parties.

II. HONG KONG SCENARIO

PREVALENCE RATE

The prevalence rate of AD/HD in a sample of more than 3,000 schoolboys of age 6-7 years in Hong Kong was 6.1% according to DSM-III-R criteria (Leung et al 1996b). A recent survey with young adolescents in Hong Kong found largely similar prevalence estimates of 5.7% for boys and 3.2% for girls according to DSM-IV criteria. (unpublished data from Leung). These figures are generally compatible to those of Western studies using DSM diagnostic criteria of 5-10% (Swanson et al. 1998). According to statistics from the Child Assessment Service (CAS) of the Department of Health, the number of new cases diagnosed with AD/HD in years 2003 to 2006 was 186, 277, 361 and 450 respectively. Among these children, there were 6 to 8 times more boys than girls. There were a sizable number of preschool children (17-18 % of all new cases). As Hong Kong children begin attending kindergarten from around 3 years, preschool cases are often identified as being disruptive or having difficulty following classroom activities while they are in kindergarten. Around 70% of the cases have average or higher intelligence. The most common co-morbid condition was dyslexia (around 30% of cases), followed by specific language impairment (around 10%) and developmental coordination disorder (around 7%). In addition, 397, 431, 500 and 671 children were found to have attention and/or hyperactive conditions at *problem level* in these four years respectively. These children exhibit difficulty attending to tasks, exhibit fidgety behaviour, while not fully meeting the diagnostic criteria of AD/HD according to DSM-IV or ICD-10. About a third of these children were younger than 6 years old. Among these children, there were 3 to 4 times more boys than girls.

LOCAL STUDIES

Validity of AD/HD in Chinese population

The following is a series of local studies in Hong Kong aiming at establishing the validity of the disorder of AD/HD in Chinese population. Is it a culture-bound disorder specific to the “permissiveness” of the Western culture? Or is it a more universal disorder with a strong biological basis? At least three criteria are required to establish the validity of a disorder: (1) a clustering of relevant symptomatic behaviours; (2) association with significant external correlates, e.g., deficits or risk factors; and (3) differentiation from other disorders, e.g., conduct disorder (CD).

A preliminary local questionnaire survey with teachers found that they complained as much inattention, hyperactivity and impulsivity in their Chinese students as their Western counterparts (Luk et al., 1988). A second large-scale epidemiological study in Hong Kong with more than 3,000 Chinese schoolboys of age 6-7 years provides more answers to the above requirements (Ho et al., 1996 a & b; Leung & Connolly, 1994, 1996, 1997, 1998; Leung et al., 1996 a & b).

First, factor analysis of the teacher and parent questionnaires confirmed the existence of an AD/HD factor, including those relevant overactive and inattentive behaviours. It was separable from an anti-social factor and a neurotic/emotional factor. This finding meets the requirement regarding the clustering of relevant symptomatic behaviours. Second, the AD/HD children, as compared to conduct-disordered and normal control children, were found to be associated with the following external correlates (i.e., deficits or risk factors): (1) a higher level of activities measured objectively by actometers or direct observation of gross body movement and gaze aversion; (2) more exposure to biological risks during pre-, peri-, and post-natal periods; (3) more histories of motor and language delays; (4) greater neurological abnormality (mainly soft signs); (5) greater impulsivity, e.g., jumping to conclusion and disinhibition; (6) greater inattention, e.g., fewer correct target hits and longer reaction-time; (7) greater distractibility, e.g., longer reaction-time in a Stroop test; (8) a lower reading score in a standardized reading test; (9) more teacher-rated academic backwardness; and (10) in short-term half-yearly follow-ups, AD/HD found to lead to CD, but not vice versa, i.e., AD/HD being a risk factor for the development of CD, but the reverse not being true. The above pattern of deficits and associated risk factors in Chinese AD/HD children is largely similar to that of Caucasian AD/HD children. In contrast, with few exceptions,

Chinese CD children failed to exhibit the above deficits and associated risk factors of AD/HD. Instead, CD in the sample of Chinese children was more associated with family disharmony and social adversity.

In sum, AD/HD as a disorder in the Chinese population meets the three criteria required for establishing it as a valid diagnostic construct. It exhibits similar deficits, associated risk factors, and differentiation from CD as in the case of AD/HD in the Western population. A commissioned commentary in *The Lancet* wrote that "Leung and colleagues have made an important contribution, by showing that one disorder, AD/HD, is not 'culture bound' and that changing our 'Western permissiveness' will not make it go away" (Anderson, 1996).

Genetic studies

To explore the biological etiology of AD/HD, a pilot genetic study was conducted with a small sample of local Chinese AD/HD children (Leung et al., 2005). In European-ancestry AD/HD children, a positive association was found between AD/HD and increased prevalence of the 7-repeat (7R) allele of a 48-bp variable number of tandem repeats (VNTR) in the exon III of the dopamine receptor D4 (*DRD4*) gene located on chromosome 11p15.5. The frequency of the 7R allele varied greatly across ethnicity and was very low in the general population of Han Chinese (0-2%). Results of this local study found that none of the Chinese AD/HD children had 7R allele. This finding matched that of a Beijing study that preceded this study and a Taiwanese study that followed it. However, our local study discovered a unique finding of an increased prevalence of 2R allele among our Han Chinese AD/HD children. A recent study on sequences of individual motifs of the *DRD4* alleles and their linkage disequilibrium (LD) with two adjacent intronic SNPs (single nucleotide polymorphism) (G/A-G/C) found in general strong LD between the A-C SNP pair and the 7R allele. However, in the Asian subsample of this study, all Asian 2R alleles examined were linked to the A-C SNP, suggesting that the 2R allele in Asians might be originated from recombinations involving the 7R allele. Biochemical analysis also demonstrated that the 7R and 2R proteins had similar biochemical functions, though the latter having somewhat a more subdued potency, in the contrast to the 4R protein. Thus, the absence of the 7R allele in our Han Chinese AD/HD children did not necessarily reject the *DRD4* hypothesis of AD/HD. Instead, the haplotype of the particular 2R allele in our Chinese AD/HD children might be derived from the 7R allele and functioned to some extent similarly as the latter. This revived a variant of the 7R allele hypothesis of AD/HD in Han Chinese. Once again, it appears that the

Hong Kong Chinese AD/HD children share a genetic vulnerability that may be compatible to that of their European-ancestry counterparts.

The above genetic study (Leung et al., 2005) is based upon a case-control design, i.e., the genotypes of AD/HD probands compared to those of the population control. However methodologically, researchers are always concerned with issues of population stratification. An alternative methodologically more vigorous design is a family-based study in which the genotypes of the parents of the AD/HD probands are examined in order to identify biased transmission of the candidate allele to the probands, using the analytic procedure of Haplotype Relative Risk (HRR). The same group of AD/HD probands, recruited in the above-noted 2005 study, was re-examined using these family-based design and HRR analytic procedure. The result re-confirmed the association between the 2R allele of the *DRD4* and AD/HD in the Han Chinese children. There was a biased transmission of the 2R allele from the parents to the AD/HD probands (Leung et al., unpublished data).

Investigation was also conducted with the dopamine transporter gene (*DAT*). No association was found between *DAT* and AD/HD in Han Chinese children (Leung et al., unpublished data).

Neuroimaging studies

A local study has been done to map brain structure in children with AD/HD using a voxel-based MRI study of regional grey and white matter volume. Twenty-eight male Hong Kong children age 6-13 years old with AD/HD and 31 closely matched controls were studied. Significant regional deficits in AD/HD were observed within a predominantly right-sided frontal-pallidal-parietal grey matter network and bilateral white matter tracts. Post-hoc comparisons suggested that comorbid ODD or CD did not greatly alter the extent of regional pathology in AD/HD. The exceptions being cerebella and striatal volume deficits, which were significantly greater in this subgroup, compared to controls. Overall, restricted structural brain abnormalities caused by AD/HD were localized to brain systems known to be necessary for attention and executive function (McAlonan, G.M., 2007).

Studies on Assessment tools

The Conners' Teacher Rating Scale (CTRS), a popular and well-established questionnaire for AD/HD, was re-validated for use in Hong Kong to screen local

Chinese AD/HD children (Luk & Leung, 1989). A local norm table was also published (Luk, Leung & Lee, 1988).

Recently, the Child Behaviour Checklist (CBCL) and its two parallel offshoots, Teacher Report Form (TRF) and Youth Self-Report (YSR), had also been re-validated for use in Hong Kong for Chinese children and adolescents. However, it appeared that the parent-informant CBCL and teacher-informant TRF were better assessment tools to screen AD/HD than the self-report YSR (Leung et al., 2006).

Intervention studies

Behaviour therapy for the AD/HD children themselves and of parent training for the parents of AD/HD children were found to be effective in reducing the disruptive behaviours of Chinese AD/HD children in Hong Kong, including those AD/HD and ODD (oppositional defiant disorder) symptoms (So, 2005). These beneficial effects of psychological intervention were obtained on top of the medication treatment for AD/HD.

In support of management in the school, an enhancement of learning behaviour project for cooperation between schools, families, and community was done by the Kwai Chung Hospital and Department of Psychology of the Chinese University of Hong Kong (So, Leung and Hung 2004). Around the same time, a two-year multi-modal intervention programme and study of generalization of clinically trained behaviour of children with AD/HD to their school setting was carried out by the Hong Kong Institute of Education and Department of Psychiatry of the Queen Mary Hospital (Heung V., 2004; Heung, V.W.K., & Ho, T.P. (2003). This programme consisted of medication, clinic based parent training, child training, and consultation and liaison work with schools. Because of the difficulties of these children have in following classroom routines, a major portion of child training in the clinic focused on developing adaptive classroom behaviour in a group format. To help children sustain and generalized learnt classroom behaviour, they were taught self-monitoring and generalization skills. The programme went further to provide training to their teachers in schools. Evaluation by the children, parents and teachers was very positive. The multi-modal programme greatly enhanced the efficacy of treatment. The skills that teachers and parents learnt have resulted in improved teaching skills and parenting skills.

In 2002-2005, Cheryl YC So of Hong Kong participated as member of the Integrated Services Programme within World Psychiatric Association (WPA) Presidential Global Programme on Child Mental Health, with World Health Organization and International Association for Child & Adolescent Psychiatry and Allied Professions. The goal was to apply research-supported treatments to routine clinical settings. Treatment manuals were developed, covering internalizing and externalizing conditions including AD/HD. Cultural adaptations to respective communities were made, and ongoing in Hong Kong (So, Bauermeister & Hung, 2005). Training modules within this programme cover stimulant medication, behavioural parent training (BPT), child training to enhance the effect of BPT, teacher training and combinations thereof.

LOCAL SERVICES FOR CHILDREN WITH AD/HD

Related Government policies

All along AD/HD has been managed separately in medical, education and other sectors with little integration or overlap. Under the Health & Welfare Bureau's Rehabilitation Programme Plan (RPP), AD/HD is still not included as a specific category that is addressed by RPP, although its potential inclusion is a subject of intense discussion in the current 2005 RPP Review exercise. As a result, programmes to address issues that may arise over the life span of an individual with AD/HD have not been developed through shared vision and cross-sectoral efforts that have the government's participation and support. In recent years, the Education & Manpower Bureau added AD/HD to the list of special education needs (SEN) categories whereby additional funding and support may be provided to the school for identified students with AD/HD. These students' difficulties are largely managed, as general behavioural and classroom issues, and collaboration with physicians taking care of these children are uncommon. The Hong Kong Examination and Assessment Authority may provide students with AD/HD with specific accommodations in open examinations if documentation of the condition and needs are demonstrated.

Medical Services

Traditionally children and adolescents suffering from AD/HD may receive treatment from the Child and Adolescent Psychiatric settings. At present there are five regional Child and Adolescent Psychiatric teams under the Hospital Authority. The services

span through tiers two to four (see 4-tier system in section on “Proposals for medical service delivery”), although the majority lies in tiers two and three. The source of new referral range widely, including physicians, psychologists, social workers, school personnel, as well as some walk-in cases in certain centres. Child and Adolescent Psychiatric teams provide tailored made multi-modal and multi-disciplinary intervention management for AD/HD cases starting off with comprehensive assessment, diagnostic formulation, followed by short- and long-term follow up treatment, support to family, care-takers & school, as well as crises intervention during the course of the illness. Consultation services to other medical professions and the Education Manpower Bureau in the management for selected cases are also provided. The existing service also includes running of training programmes for other professionals and front-line child care workers (e.g. doctors, nurses, social workers, teachers), as well as organizing educational activities to the general public. The multi-disciplinary composition of staff includes child psychiatrists, clinical psychologists, specialized psychiatric nurses, occupational therapists, physiotherapists, medical social workers, dietitians and teachers.

The Child Assessment Service of Department of Health provides comprehensive assessment service to children with developmental problems, including issues in attention, hyperactivity, behaviour and learning. Developmental paediatricians and clinical psychologists evaluate these children. For those diagnosed with AD/HD, psycho-education will be provided and interim support in form of parenting training and medication will be provided as indicated. Liaison with the school personnel, provision of detail assessment summary to the school and advice for teacher on child handling strategies may be provided. The patient will be referred to the regional child psychiatric service for follow up, medication, training and counseling and long term management.

A significant portion of children presenting with features of AD/HD is currently managed by general paediatricians, family physicians and private psychiatrists.

Educational Services

The current policy of the government encourages students with special educational needs (SEN) to study in ordinary schools if they can benefit from the ordinary school setting. The goal of inclusive or integrated education is to help SEN students to reap the benefits of education from mixing and interacting with ordinary children in an ordinary environment.

At present, the Education and Manpower Bureau (EMB) includes AD/HD as one of the Special Educational Need (SEN) categories in the primary school service. The government will provide additional resources to the school on pro rata basis. The student guidance personnel, plus or minus the student support team, will formulate their individual plan of support to the students in their school. The supportive services could include special classroom arrangement and instruction, intensive remedial service, peer support, and behavioural management, etc. But their nature and quality are highly variable across different schools, depending on the experience of the school personnel and many other factors. The quality of these supportive services is also difficult to judge and lacks adequate monitoring. Educational psychological service provided by EMB or other outsourced agencies may give necessary support to the student guidance personnel, but these services are notorious as being very limited.

Community services and family support

Effectiveness of parenting skills is a strong predictor of how well a child with AD/HD will fare in adulthood. Behavioural parent training programmes have been used for many years and have been found to be very effective (Brestan, 1998). Although many of the ideas and techniques taught in behavioural parent training are common sense parenting techniques, most parents need careful teaching and support to learn parenting skills and use them consistently. Parental training programmes on child management skills aiming to establish consistent positive parenting practices and to eliminate harsh, excessively permissive, and inconsistent behaviour management practices have been demonstrated to be effective in increasing children's compliance with parents and improving their relationships. In Hong Kong, they are available both in the community as provided by non-government organizations, such as the Boys' and Girls' Clubs Association of Hong Kong, the Supportive Learning Project of the Heep Hong Club and by child psychiatric services in the Hospital Authority. However, many parents may not be able to attend such training due to lack of time or determination. Since a number of these parents may also themselves have attention issues, effective implementation of learnt parenting techniques might not be possible. Research data on the effectiveness of these local programmes is sparse and much needed.

CHALLENGES & PROPOSALS

Medical Services

Challenges

Assess to service

Despite the recognized need for specialist treatment of this group of children, resources for assessment and child psychiatric services far fall behind demand. The waiting time of Child Assessment Service (CAS) ranges from 3–6 months, and that of the Child Psychiatric Services range from 9 months to 3 years for the first assessment, with a further wait of 1-2 years for subsequent treatment highly undesirable from perspective of early intervention. Around 10–12 groups of behavioural group training were held each year by all the child psychiatric services under Hospital Authority, which can only serve around 100 – 150 children with AD/HD. This must be very inadequate, with local prevalence at around 5% as cited. A significant portion of these children is treated with medication by the general community paediatricians or family physicians who may or may not have received focused training on management of cases with AD/HD. Most private practices do not have the time to implement behavioural or parenting training, nor to coordinate educational remedial services for their clients with AD/HD. In addition, communication among physicians, as well as their communication with other childcare professionals, is very limited.

Manpower

1. Paediatricians

1. Hong Kong requires a total of about 850 paediatricians (Hospital Paediatricians 220, General Paediatricians 350 and Community Paediatricians 280 (HK College of Paediatricians data). These paediatricians as quoted comprise of general senior paediatricians (70), Student Health Services (40), Family Health Services (80), child assessment and rehabilitation (80) and Clinical Genetic Service (10). There are currently 463 qualified paediatricians, with a projected deficiency of 387.**Child Neurologists:** Of a total projected requirement of 28 Child Neurologists for Hong Kong up to 2010, there are 24 trained medical doctors in this subspecialty

2. **Developmental Paediatricians:** Of a total projected requirement of 30 Developmental Paediatricians up to 2010, here are 19 trained medical doctors in this subspecialty.

2. Child psychiatrists

Manpower needs for child psychiatrists vary with the scale of service and service pledge. Hong Kong's child psychiatrists recommend the following parameters to serve as a guideline of a reasonable service for AD/HD cases, for which corresponding manpower should be planned and provided:

- (1) all new referrals to child psychiatry centers should go through a triage process
- (2) waiting time for urgent cases should be within 2 weeks
- (3) waiting time for less urgent cases within 8 weeks
- (4) waiting time for non-urgent cases within 4 months
- (5) a new case interviewing session needs at least 2 hours
- (6) the first 2 follow up sessions (immediately following the new case interviewing session) should be at least 45 minutes
- (7) the subsequent follow up sessions should be at least 20 minutes
- (8) Treatment should be multi-modal, integrating pharmacological, behavioural and school management in various combinations depending on the individual needs & the unique family environment of that particular patient
- (9) Behavioural treatment programme should consist of weekly session for 6 months for both the patient and the parents/care takers, either in individual or group format plus a few phone consultations to class teachers
- (10) Waiting time for behavioural treatment programme should be less than 1 month

These parameters, particularly those on waiting time upon referral, often could not be met under the current manpower situation. In many instances as described in the above section on access to services, the wait could be up to years. Many fold increase in child psychiatrists will be needed to achieve the proposed pledge, and there are few options to achieve this in the near future. With limited alternatives for many parents at this time, the wait could mean aggravation of problems for affected children at home and school, and for families, and often long term detrimental complications and negative outcomes.

3. Clinical psychologists

Based on the local prevalence rate of 3- 6 % in school aged (6 – 18 years) children, the number of children affected with AD/HD is estimated to range from 16,000 to 32,000. At present, there are about 40 clinical psychologists (from the public service and non-government organizations) who provide diagnosis and intervention for children and adolescents with a variety of mental health and developmental problems. The recommended ratio of psychologist per capita in developed countries is 1 psychologist to 3,500 child population and the projected number of psychologists required for the child population in Hong Kong is 154. Thus, the existing number of clinical psychologists who work with children falls far short of projected demand. In order to provide much needed behavioural therapy group treatment and parent training for AD/HD children, the number of clinical psychologist positions in the public service should be substantially increased.

Need for evidence based programmes

In order that services delivered are valid and cost effective, medical service providers need to gather evidence on what works for children with AD/HD and their families in Hong Kong's settings. These then will have to be disseminated to fellow service providers and trainees, such that an accountable care system can be assured.

Proposals

Service delivery and medical manpower

In response to observed inadequacies described above, a Task Force on Mental Health Services for Children in Hong Kong was established under the Joint Committee on Child Health of the Hong Kong Paediatric Society, the Department of Health of the HKSAR Government and the Hospital Authority of Hong Kong. The Hong Kong Society of Child Neurology & Developmental Paediatrics Working Group on AD/HD was also set up in response to perceived urgent needs of affected children and families. The purposes were threefold: to ensure evidence based practices, logical and efficient division of labour among different medical personnel, and to determine manpower needs and how they might be met. An adaptation of the UK 4-Tier Service Model for Hong Kong's reference. This model was further modified by current key-players during negotiations at the forum for this position paper.

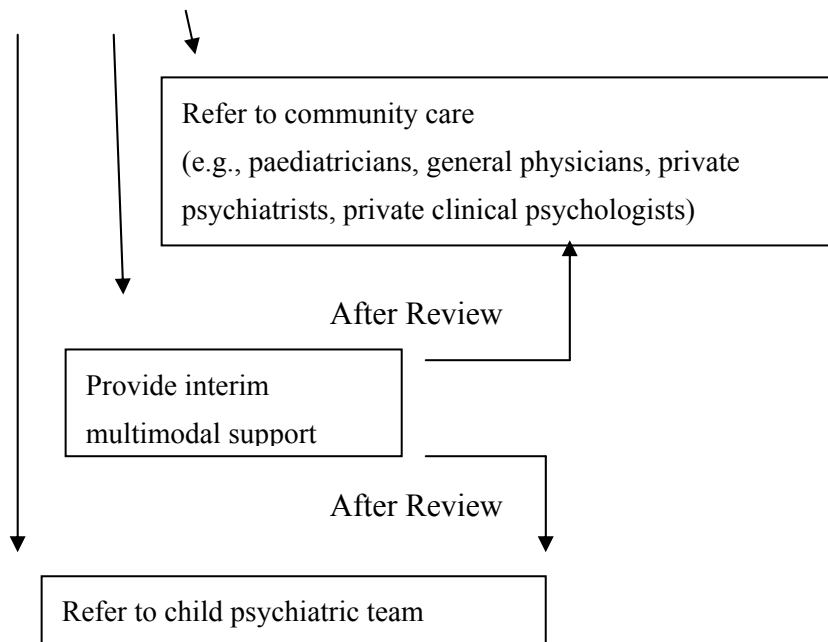
Tier One Non-Mental Health Professionals
(e.g., Paediatricians, General Physicians, Nurses, Teachers, Social Workers)

- Identify at risk children
- Rule out underlying medical conditions
- Provide parent guidance and health education
- Initiate referral to Tier Two professionals

Tier Two Specialized Team with AD/HD Experts
(including Child Psychiatrists, Clinical Psychologists, Child Neurologists / Developmental Paediatricians / Paediatricians with specialized training in AD/HD)

- Conduct thorough diagnostic assessment
- Formulate a comprehensive treatment plan
- Provide public education on AD/HD
- Provide consultation and training to Tier One professionals
- Initiate management pathway as follows:

Management Pathway



Tier Three Child Psychiatric Team

(including Child Psychiatrists, Clinical Psychologists, Psychiatric Nurses, Occupational Therapists, Physiotherapists, Dieticians, Teachers with training in special education, Medical Social Workers)

- Provide intensive, multi-modal treatment
- Conduct on-going assessment
- Provide consultation to Tier Two professionals
- Review progress and initiate step-down care if appropriate
- Coordinate long term care with Tier One professionals and other community care professionals

Tier Four In-patient Psychiatric Care

- Provide intensive, multi-modal management to very severe, complicated AD/HD cases

Early identification of the disorder is an important but unfulfilled step currently. Non-mental health professionals (Tier One) can play an important role in identifying at risk children and referring them to receive diagnostic assessment. A specialized team with AD/HD experts (Tier Two) should be set up to conduct proper, thorough diagnostic

assessment and to formulate a comprehensive treatment plan. Considering the nature and severity of the disorder and parent's preference, children with a confirmed diagnosis of AD/HD could receive interim support (e.g., psychoeducation on AD/HD and a trial of medication) from the specialized team or they could choose to receive pertinent treatment in community settings. To address the stigmatization of the disorder and facilitate the help-seeking pathway, Tier Two professionals can play an important role in public education on AD/HD and provide training to Tier One professionals. For those AD/HD children with co-occurring psychiatric disorders, complicated psychosocial circumstances or medication resistance, they need to receive intensive, multimodal treatment which is provided by the child psychiatric teams with multidiscipline professionals (Tier Three and Tier Four). In view of its chronic/persistent nature, AD/HD requires consistent long-term case management and which could only be achieved by having seamless collaboration between different professionals.

Through this structure, it is hoped that clear indications are provided on when and where to refer children for different levels of professional care, with minimal delay in management and maintaining of seamless care. Provision of manpower in this system through training of respective professionals in the structure is essential for effective implementation of the proposal. These may be achieved through in-service strengthening of skills via continued medical education and formal postgraduate courses. Opening of necessary posts in public service (especially in child psychiatry) should be advocated for, to encourage young doctors and psychologists to go into respective fields. Through this system of shared care, it is hoped that unnecessary waiting time at bottlenecks may be alleviated, and evidence based services ensured.

Educational support

Challenges

Integrated Education

At present, AD/HD children are identified as one category of Special Educational Needs students, and receive integrated education. Although integrated education is “aimed at helping students with a disability to integrate into the mainstream as far as possible, so that they can receive an appropriate education alongside their peers,” in reality AD/HD students often do not receive the full benefits of their education experience. There are several major problems.

Class size

With the present class size of 30 or more students in primary schools, many AD/HD students do not receive sufficient attention or instructional support from their teachers. AD/HD children often learn best with multi-modal instruction involving visual and audio stimulation, and motor activities, with interactive activities involving teachers and the peers, with well-structured tasks, and with frequent and specific feedback. These modes of instruction require not only an individualized curriculum but also a lot of support from the teacher (e.g., special teaching strategies, preferential seating, and supportive technology). A big class size imposes severe constraints on what teachers can do to help AD/HD students.

Manpower

Teachers in the inclusive schools in Hong Kong are not supported by teaching assistants or paraprofessionals. The No Child Left Behind Act of the US recognizes that “properly trained paraprofessionals (teaching assistants) can play important roles in improving student achievement in Title 1 [inclusive] schools by reinforcing and augmenting a teacher’s effort in the classroom.” It specifies that all paraprofessionals must have “(1) completed two years of study at an institution of higher education; (2) obtained an associate’s (or higher) degree; or (3) met a rigorous standard of quality and be able to demonstrate, through a formal State or local academic assessment, knowledge of and the ability to assist in instructing reading, writing, and mathematics (or, as appropriate, reading readiness, writing readiness, and mathematics readiness).” It is unfortunate that there are hardly any properly trained paraprofessionals in the staff of the schools in Hong Kong.

Insufficient teacher training

At present, teachers do not have systematic training in helping AD/HD students. Although there are some professional development opportunities available, each of these opportunities has its own shortcomings. Firstly, initial teacher education programmes do not require student teachers to take courses related to AD/HD. As a result, beginning teachers may have completed teacher training with hardly any knowledge of AD/HD. Secondly, although in-service teachers can learn about AD/HD by taking continuing professional development (CPD) courses organized by EMB or NGOs, CPD courses often lack bridging between theory and practice. Thirdly, in advanced programmes (e.g., masters programmes), there is little opportunity for supervised practice (e.g. practicum) because of cost consideration.

As a result of inadequate training, many teachers are unable to manage the disruptive behaviour or to elicit learning behaviour of AD/HD students, making the outcomes of integrated education questionable.

Proposals

Small Class Size

At present, EMB is implementing a pilot scheme of small-class teaching at the junior levels of a few primary schools. The rationale for the scheme is that small-class teaching may be most beneficial to disadvantaged students. The definition of disadvantaged students includes students of lower socio-economic status and with weak family support, but not students with special education needs in general, nor AHDH students in particular. Given that AD/HD students often produce disruptive behaviour in class, and that they could be helped with individualized instruction and specific feedback, it is only reasonable that they could also benefit from greater teacher attention afforded in small-class teaching environment.

Paraprofessionals in schools

To help teachers meet the complex demands of inclusive learning environments, the supporting roles of paraprofessionals or teaching assistants are very important (Giangreco, Edelman, Broer, & Doyle, 2001). Paraprofessionals should be trained in programmes that prepare them with knowledge and skills directly related to the six roles of paraprofessionals identified by Pickett, Likins and Wallace (2003), which are: (1) assisting teachers with organizing learning activities and maintaining supportive environments, (2) engaging individual and small groups of learners in instructional activities developed by teachers, (3) supporting teachers in functional assessment activities, (4) documenting data about learner behaviour and performance, (5) implementing teacher-developed management and disciplinary plans, and (6) assisting teachers with involving parents in their child's education. Likins (2002) has also identified several core components of training paraprofessionals working with students of various kinds of special needs. Among these components, six areas are of particular relevance to the education of AD/HD students: (1) roles and responsibilities of paraprofessionals, (2) ethical issues for paraprofessionals, (3) behaviour management practices, (4) providing instructional support, (5) observing and recording student performance, and (6) teaming and communication skills.

Social workers in schools

Students with AD/HD may come to the attention of a school social worker first for misbehaviour in the classroom. It is very important that the school social worker has enough knowledge about AD/HD children to make referrals for medical services. Since the school social worker often serves as case manager in helping AD/HD children, he or she must be able to provide supportive services to the families of the children with AD/HD.

Beginning school social workers should be able to consider AD/HD as an underlying cause for school failures and dropouts, and to provide needy services for these children or adolescents accordingly. Experienced school social workers should be provided with continuing professional development opportunities in order to specialize in helping AD/HD children and adolescents, and their families.

Training of teachers (see section on Professional Training)

Coordinated services in schools

The services provided by teachers, paraprofessionals, educational psychologists and school social workers should be coordinated within the school and outside with the medical professionals and clinical psychologists in order to give AD/HD students the best services. A senior teacher heading the school's learning support team should be assigned by the school for such liaisons of concerned parties. Within this system, school social workers could serve as case managers to call for discussions between school, families of AD/HD students, education or clinical psychologists and medical doctors. Teachers could work with educational psychologists to develop behavioural and academic treatment plans for the AD/HD students, and provide feedback to medical professionals regarding the effects of medication and to the clinical psychologists regarding the effects of clinic-based behavioural treatments. The senior teacher coordinator could oversee smoothness and effectiveness of the collaboration, decide when case conferences are indicated, and initiate and convene such conferences. Teachers should be assisted by paraprofessionals in implementation of daily routines (e.g., taking medicine) required to take care of AD/HD students.

Support in the community

Challenges

In devising policies and services for children suffering from AD/HD, it is noteworthy that these children do not live in a vacuum. A survey of the literature shows that these children need the support of the parents and their families. In addition, the objective as well as subjective burdens borne by the parents or caregivers of these children should also be seriously taken into account. Therefore, it is argued that a family-based approach in helping children with AD/HD and their families should be adopted (Shek & Tsang, 1993a, 1993b). Unfortunately, even with the implementation of integrated family services in Hong Kong, the gap between rehabilitation and family service is still very wide.

Relative to comparison groups, parents of children with AD/HD report more frequent and severe inter-parental discords and child-rearing disagreements, more negative parenting practices, greater parental stress and caregiver strain, and more psychopathology in them. Parenting training programmes and family supportive services gear to the needs of these parents and their family members, such as the siblings are deeply insufficient, and resources should be directed to the appropriate service providers (e.g. community service providers, integrated family service centers, child psychiatric services). According to a recent survey conducted by the Child Assessment Service on the service needs of a group of parents (93 in number) whose children have been diagnosed to have AD/HD, they were most concerned about the long waiting time for diagnosis at the regional child psychiatric centers and then the long waiting queues for behavioural group treatment. They also expressed their discontent with the lack of adequate resources and support for their children at the mainstream schools. The Hong Kong Association for AD/HD, a local association for parents of children and young people with AD/HD, has just been formed to advocate and develop necessary services and support for the affected children and their families. Their first priorities focus on setting up a supportive network for local parents of children diagnosed to have AD/HD and advocating for needed services and support for their children in the school setting and in the wider community.

Service coordination

Joint efforts in development of evidence based integrated services

All professional teams delivering support services to these children and their families should base their programmes on theoretically sound models with sound outcome evaluation components. Programmes that have been researched in Hong Kong, including those discussed in the section on “Local Intervention Studies”, should be taken forward and disseminated. It is inefficient and costly when efforts are duplicated in different research projects across academic institutions and sectors. Pooling of research data and clinical experience is essential, especially in light of the urgency for needed support.

Multidisciplinary input in service delivery

Management of AD/HD involves a multidisciplinary approach, and coordination among different disciplines is of critical importance. It involves the medical doctors who provide the medication, clinical psychologists or other community childcare/ family workers who provide the child behavioural training and parent training, teachers and educational psychologists who provide the educational remediation, parents of the children, and other personnel who are involved in the care of these children. In Hong Kong, there is a lack of

platform for proper communication among these disciplines. Case conferences and liaison meetings have been held between HA Child Psychiatric departments, Child Assessment Service and regional Educational Psychological services of EMB, but they are not regular activity and the number of cases that could be discussed in these meetings is very limited. Only for those very difficult cases will there be an IEP (Individualized Educational Plan) meeting held in the school involving school personnel, parents, plus or minus other professionals who are taking care of the children. Although this kind of IEP meeting is readily held in the schools in developed countries such as USA, we are just starting to apply it in Hong Kong. Limitation of resources among public service providers such as child psychiatrists and educational psychologists has significantly hindered the time and resource that can be devoted to these coordination works. The psychological barrier of working with different professionals, service boundaries and other political reasons also hindered the communication among different professional, departments and organizations in caring of these children. For those children under the care of private service sectors, the coordination of care is even uncertain.

PROFESSIONAL TRAINING

Training of doctors

Current situation

Medical management of this condition as a specialty is clearly subsumed within psychiatry and developmental paediatrics, while other specialties including family medicine, internal medicine and neurology may also deal with this condition to varying degrees. The training of Hong Kong medical doctors on childhood AD/HD occurs at different stages and level of their career:

Training of Medical Undergraduates (MBBS)

These are trained under the university medical schools within the curriculum of mental health for children and are implemented as part of the integrative medical problems at the pre-clinical years and during the fourth year where undergraduates are exposed to problems of AD/HD in theory within the systemic lectures and in practical via the specialty clerks of Paediatrics and Psychiatry. There are no special modules for AD/HD as such. Exposure to AD/HD cases is very limited.

Training of Paediatricians

AD/HD is trained as part of the basic training under “Community Child Health”

(currently known as training on Child Health at the Family Health Service of the Department of Health during Basic Training). Optional module of 6-month training in mental health can also be included during Higher Training period. This part of the training is under the ambit of the Hong Kong College of Paediatricians and mental health is included at the Exit Assessment for final qualifying assessment of paediatricians.

Training of Child Neurologists and Developmental Paediatricians

This is effected via guidelines produced by the Hong Kong Society of Child Neurology and Developmental Paediatrics and implemented via training units (Departments of Paediatrics) under the Hospital Authority of Hong Kong. As there are no official training programmes from the statutory body for training (the Hong Kong College of Paediatricians), training in mental health remains a professional rather than academic education. There is still no good quality control of training on the subject.

In-Service Training for Practising Paediatricians and Family Doctors

This is effected via the examination for Diploma in Child Health conducted by the Hong Kong College of Paediatricians, the courses on Diploma on Child Mental Health by the Psychiatry Department of the two universities, and the Annual Update Series on Child Health jointly organized by the Hong Kong Paediatric Society and the Hong Kong College of Paediatricians. There are also ad-hoc professional meetings on childhood mental health problems including AD/HD organized by the Hong Kong Society of Child Neurology and Developmental Paediatrics, the Hong Kong Paediatric Society and the Hong Kong College of Paediatricians accredited as Continuing Medical Education (CME) activities. Target recipients are paediatricians and family physicians. Response to these scientific activities has been overwhelming from the professionals. There is no specific course on AD/HD as such on regular basis.

Training of Child Psychiatrist Hong Kong is very short of Child and Adolescent Psychiatrists. There is an urgent need to increase the number of Child and Adolescent Psychiatrists in Hong Kong from the current number of 15 to 25. Child and Adolescent Psychiatrists provide the leadership in the multi-disciplinary approach and provide the care for the more complex cases. By providing support to all the other mental health professionals, the management of children with AD/HD will be much more effective and efficient.

At this stage, the number of trainees for child and adolescent psychiatrists are

decreasing because the trainees do not see that there is a future in the development of child and adolescent mental health services.

Summary on of Current Training on AD/HD amongst medical doctors

This is grossly inadequate with lack of comprehensive training programmes, clinical exposure, quality assurance and in-service continuing medical educational activities.

‘The 2005 Survey amongst Paediatricians in Hong Kong’ conducted by the Joint Committee on Child Health by the Hong Kong Paediatric Society, the Hong Kong College of Paediatricians, and the Department of Health of the HKSAR Government revealed gross deficiency in clinical training, exposure and understanding of childhood mental health problems. There was unanimous out-cry from the paediatricians for more structural training on the subject so that they are ready to face the challenges in providing better services for our children in Hong Kong.

The number of Child and Adolescent Psychiatrist are grossly inadequate in Hong Kong. This cannot be replaced by asking adult psychiatrist to see more children. Without adequate experts in this field, the training, research and services will always fall behind.

It is thus imperative that a better system for training, service, research and resources support is imminently indicated in Hong Kong so as to enable professionals to deliver quality mental health services in alignment with the high standard paediatric services which Hong Kong has always been held in the highest regards by child workers all over the world.

Proposals

Training of Medical Undergraduates

AD/HD should be included as part of the training curriculum under the specialty clerk training on “paediatrics and child health” and “psychiatry”. The training should be under the ambit of basic medical training under the supervision of the medical schools.

Training of Paediatricians

AD/HD should be part of the compulsory 6-month module under “Community Child Health” (currently known as training on Child Health at the Family Health Service of

the Department of Health during Basic Training). Further module of 6 to 12 months training in mental health can also be included during Higher Training period. This part of the training should be under the ambit of the Hong Kong College of Paediatricians and mental health should be part of the Exit Assessment for final qualifying assessment of paediatricians.

Training of Child Neurologists and Developmental Paediatricians

This is in the process of accreditation by the Hong Kong College of Paediatricians. Mental health should definitively be part of the compulsory module for training in both subspecialties. It should preferably consist of at least six months within the subspecialty trainings.

Training of Child and Adolescent Psychiatrist

There is an urgent need to increase the number of child and adolescent psychiatrists in Hong Kong. To do so, the number of child and adolescent psychiatrist position in the HA child and adolescent mental health services should be substantially increased. The initial target is to increase by 100%.

Training of Adult Psychiatrists

Adults with AD/HD are now recognized as not uncommon and there is an increasing need to provide services for adult with AD/HD. AD/HD often exists as co-existing conditions with other mental health conditions. Adult psychiatrist training programme should include training for the recognition and treatment of adults with AD/HD.

In-Service Training for Practising Doctors (Non psychiatrists)

1. Training of Family Physicians and Child Health Professionals

This can be effected via Diploma and Certificate Courses hosted by qualified professional bodies (Hong Kong Paediatric Society, Hong Kong College of Paediatricians, Hong Kong College of Psychiatrists, Hong Kong Society for Psychiatry and others) with good accreditation, quality assurance and full accountability in training. Mental health problems should be included as part of the syllabus for the Diploma of Child Health training and examination. There should also be regular in-serve training on childhood mental health problems by local and international experts on the subject creditable for CME/CPD activities.

2. Training of Paediatricians

This can be achieved via Diploma Courses with interactive curriculum on areas

of childhood mental health issues at least 40 credit hours per course with small classes (not more than 20 trainees per class), intensive exploration of clinical problems, and with continual surveillance of the training course to ensure good quality control and high standard outcome. There should also be regular CME/CPD activities on the subject to provide update knowledge, information and skills on AD/HD for paediatricians.

3. Update Training for Child Neurologists (CN) and Developmental Paediatricians (DP)

There should be regular day-release course on the subject organized by the Hong Kong Society of Child Neurology and Developmental Paediatrics, the Hong Kong College of Paediatricians, the Hong Kong College of Psychiatrists to bring the most up-to-date knowledge which is essential for quality service within the subspecialties. The CN and DP subspecialists being goal-keeper at Level Two services are obligatory to take up the mission to update themselves and to educate fellow paediatrician on AD/HD.

Training of Clinical psychologists

Current situation

Training of professional clinical psychologists in Hong Kong is provided by the M.Soc.Sc. in Clinical Psychology programmes offered by both HKU and CUHK. The theoretical and clinical aspects of AD/HD are covered in courses of psychopathology and intervention. Depending on the settings of the clinical placements, some clinical psychologists-in-training have practical experience in diagnosing and treating AD/HD children. However, this is far from adequate from making the graduates having specialist knowledge on AD/HD. In this connection, seminars or workshops on the subject of AD/HD by international experts are available on an irregular basis as a form of continual professional education.

There is no formal in-service training mechanism for practicing clinical psychologists.

Proposals

Diploma or Certified Courses with interactive curricula on the diagnostic and intervention aspects of AD/HD could be jointly hosted by professional or academic bodies, such as the Division of Clinical Psychology of the Hong Kong Psychological Society, the Hong Kong College of Psychiatrists, and the universities.

Specialized attachment training programmes on AD/HD for practicing psychologists may be made available at the various psychiatric units and child assessment settings. Manpower and resources support are indicated to make these programmes viable and benefiting to a large number of interested professionals.

Training of Educational Psychologists

Current situation

Training of Educational Psychologist (Professional Practice) in Hong Kong is provided by the Department of Psychology of the University of Hong Kong. The programme includes both courses and supervised practicum. Three courses in particular include AD/HD in their coverage. (1) **Psycho-Educational Assessment**: which introduces formal and informal techniques and instruments for assessment of students with special educational needs. (2) **Children with Special Needs I & II**: which covers basic concepts, diagnostic and remedial procedures for students with different educational needs. (3) **Psycho-Educational Intervention**: which introduces different approaches of interventions, some of which may be useful for training students with AD/HD. **For fieldwork placement**, some educational psychologists-in-training may have opportunities to learn under the supervision of senior educational psychologist how to provide professional consultations to teachers and parents in helping AD/HD students.

This programme admits only 20 students every two years, which is not sufficient to meet the ever-increasing demand for EP. Recently, EMB has proposed to upgrade the EP-School ratio to 1: 5 or 12 and 1: 12, for the primary and secondary sectors, respectively. But there is no specified date for this target to realize.

Proposals

AD/HD should be a mandatory component of EP programmes. In addition to course work, each student-EP should be placed in a supervised fieldwork related to identifying and helping children with AD/HD.

The EP-School ratio should be set at 1 to 5 for both primary and secondary schools, which means that there need to be more than 200 EPs. To accomplish this objective in a reasonable time frame, the universities in Hong Kong should start new EP programmes or admit more students into the existing programmes. Provision of a senior educational psychologist position should also be given to educational psychologists who specialize in helping AD/HD students.

Training of Teachers

Current Situation

Initial Teacher Education

Beginning teachers in Hong Kong are trained in either Bachelor Degree (BEd or BA) or Postgraduate Diploma in Education (PGDE) programmes. Our survey found more than 50 such programmes, including distance-learning programmes. Among these, 21 have at least one course or module related to AD/HD (see Table 1). However, the course is usually a general course on inclusive education, student diversity, or special education needs, which at best may include AD/HD as one topic in the course syllabus. Furthermore, the course is usually offered as a free elective and not a required course. The implication is that graduates of these teacher education programmes may not be informed about AD/HD.

Currently, there is only one initial teaching education programmes specialized in helping special educational needs students. It is a PGDE (Major: Special Education, 2-year Part-time mode) offered by HKU. Although HKIEd offers a PGDE (Special Needs Strand, 2-year Part-time mode) and an BEd (Special Needs, 3-year Part-time mode) programmes, they are for in-service teachers who already possess a certificate in education or equivalent.

In short, the initial teacher education programmes in Hong Kong provide beginning teachers very little training related to helping AD/HD students.

Continuing Professional Development

For in-service teachers who are interested in knowing more about AD/HD, EMB invites local educational service providers to organize Continuing Professional Development (CPD) courses leading to a certificate. A notable one is organized by HKIEd, entitled “Professional Development Course for Teachers (Catering for Diverse Learning Needs),” which consists of 90 hours of training. However, most of these programmes do not provide much help for teachers to bridge the gap between theory and practice (see Table 2).

Advanced Training

Teachers who are interested in more formal and advanced training may enroll in Advanced PGDE or Masters’ programmes with a specialization in Special Education Needs. The notable ones are: (1) CUHK- MA (School Guidance & Counseling)

(Specialized in Special needs or Specific learning difficulties); (2) HKIEd - MEd (Specialized in Exceptional Learning Needs); and (3) HKU - MEd (Specialized in Special Education). However, only some of these programmes (e.g., CUHK, MA (School Guidance & Counseling) (Specialized in Special needs or Specific learning difficulties)) offer their students supervised practicum (see Table 2).

Informal Training

From time to time, EMB, NGOs, or extramural units of universities offer workshops or seminars related to helping AD/HD students. However, these workshops or seminars have diverse organizers and audience. To quote from a report by the National Joint Committee on Learning Disabilities of the USA (1999), these “‘sit and get’ sessions in which relatively passive participants were made aware of the latest ideas regarding teaching and learning from ‘experts’” do not support organized and continuing development (see Table 2). The report stated further that “Today professional development must include high-quality, ongoing training that reflects a variety of approaches, with intensive follow-up and support. *NJCLD strongly believes that professional development is an ongoing process of continuous improvement that includes meaningful needs assessment, intensive informational sessions, and long term follow-up and support. It is not an event.*” (NJCLD, 1999, pp.2)

Summary of current training on AD/HD amongst educators

Current teacher education programmes in Hong Kong are far from desirable in terms of training teachers to help AD/HD students. This is disappointing because we now know that, based on research evidence, there are effective evidence-based interventions or treatments that can help AD/HD students. But these interventions and treatments consist of multiple components and are not easy to execute. Teachers need be trained in order to implement them skillfully. Research in the areas of teacher professional development and special education shows that evidence-based educational approaches need to be “translated” carefully and systematically into classroom practices (Gersten and Dimino 2001, Goldenberg & Gallimore, 1991). Educational changes need to be implemented, supported and sustained in schools. Teachers are also students when they learn new teaching skills and strategies and they need scaffolding and time for continuous development. It is imperative that they are supported by a coach, or a mentor, who provides ongoing assistance to them at their schools (Gersten, Morvant, & Brengelman, 1995; Little, 1987; Hamilton & McNerny, 2000). In other words, a new model of teacher training is called for.

Proposals

Teachers should be trained to use evidence-based multi-component treatment programmes that are effective for helping AD/HD students (e.g., Miranda et. al., 2002; Barkley, 2004). Teacher training programmes should also include scaffolding support by a mentor who provides ongoing assistance to the student-teachers at their schools (Gersten, Morvant, & Brengelman, 1995; Little, 1987; Hamilton & McInerny, 2000; Shiu & Cheng, 2006). That person needs to be knowledgeable about the instructional problems and the innovative practices, and to provide specific feedback to teachers on implementation issues for an extended period of time (Gersten & Dimino, 2001). Teachers' efforts should be further supported by properly trained paraprofessionals (i.e., teaching assistants). The current supportive service provided by student guidance personnel and educational psychologist also need further review and improvement in terms of their quality and effectiveness.

Training of Social Workers

Multidisciplinary collaboration is vital to the treatment and rehabilitation of children with AD/HD. As such, different professionals should have adequate training on how to handle children with AD/HD and their families. Unfortunately, with particular reference to social work education, AD/HD is minimally covered in the existing social work training programmes in Hong Kong. In most cases, the "topic" may be covered in courses like "Human Behaviour and the Social Environment" and "Mental Disorders" with very slim coverage. Basically, under the current social work education at the undergraduate and sub-degree levels, it is not likely that the graduates will have an adequate understanding about the nature and intervention related to AD/HD. This inadequacy also applies to the postgraduate social work training programmes in Hong Kong (e.g., MSW programmes for graduates with no social work training). Furthermore, in view of the lack of evidence-based social work practice in Hong Kong (Shek, Lam & Tsoi, 2004), related elements should be injected in the AD/HD training programmes for social workers.

In-service training and certified courses with interactive curriculum jointly organized by education and social work authorities should be offered to practicing school social workers regularly. Attendance should be compulsory or strongly encouraged, with the contents of the course including skills in identification and initial assessment of students with suspected AD/HD, as well as counseling and group work skills for helping these students and their families.

Training of Para-professionals

Likins (2002) points out that paraprofessional training can take many forms such as credit-based courses offered through universities or community colleges, a series of in-service workshops, peer mentoring or apprentice sessions as well as systematic on-the-job training by a supervisor. In view of the rapid development of associate degrees in Hong Kong, it is suggested that paraprofessionals be trained in such programmes. The No Child Left Behind Act of the US (2001) also requires paraprofessionals to have at least an associate degree or two years of college. In addition, workshops and short-term courses should be provided for their continuing professional development,

Time framework for professional development

In order to effect quality service on the subject of AD/HD, training at all levels of care as stipulated above should be implemented simultaneously. The professional individuals involved would include family physicians, paediatricians, child neurologists, developmental paediatricians, health professionals and others while responsible professional bodies should comprise the Hong Kong Paediatric Society, Hong Kong College of Paediatricians, Hong Kong College of Psychiatrists, the two medical schools under the universities and all tertiary institutions responsible for training of health and social work professionals. It is estimated that with dedicated effort an effective service should be ready for Hong Kong in ten years' time.

PUBLIC EDUCATION

In its rehabilitation policies, the government of Hong Kong has indicated its recognition of the presence and special needs of children and individuals with AD/HD. The next step is to foster an accurate and scientific understanding of the condition by the general public and professionals alike. A well-informed public (including parents, child caretakers, school teachers and family workers) enables earlier detection, diagnosis and treatment of the condition. It also avoids common misunderstandings and stigmatization of AD/HD, which will perpetuate the suffering of affected children, adolescents and adults. Public education through the mass media, professional education in undergraduate as well post-graduate courses and workshop to promote acceptance and effective support are necessary.

Advocacy work is the intrinsic duty of all professionals dedicated to child health in Hong Kong. Success of work on AD/HD depends vitally on evidence-based practice, professional readiness, resource availability, social justice and governmental endorsement and support in the community. All these attributes are ready in Hong Kong and therefore professional training is essential to bring all advocacy work into fruition, and to have all visionary concepts realized into good practice.

RESEARCH ON AD/HD

To facilitate the development and implementation of policies and services in the prevention and rehabilitation children with AD/HD, further research on the subject is important. Research on AD/HD, be it clinical or epidemiological, should be supported by academic institutions, the Hospital Authority and Department of Health. The neural basis of AD/HD and the neuroplastic/behavioural changes associated with interventions are important for understanding theoretical underpinnings of the condition. Studies for further understanding of the nature of AD/HD in the Chinese culture is necessary for understanding the ecological context within which to help these individuals and their families. Longitudinal studies including those on evolving risk-taking behaviours, antisocial behaviours, organizational and interpersonal skills would help shed light on the prognosis of this condition and relevant services needed for this group of children when they get older. Research on the prevention and early identification and intervention programmes should be funded, and evaluation of intervention programmes conducted. Valid, standardized, local screening and assessment instruments for different age groups also need to be developed. Unfortunately, the existing literature suggests that related social research on AD/HD in the Chinese culture is far from satisfactory (Shek, 1995; Shek, 2002, Shek, Chan & Lee, 2005), and further efforts on this are essential to ensure that services could be culturally competent to the populations addressed.

CONCLUSION

Movement forward hinges on the cooperation and input from multiple sectors and multiple levels, including public services, academic institutes, non-government organizations and natural community support systems. Upon this platform of collaboration there needs to be effective programmes supported by evidence and delivered through partnerships with families and interdisciplinary processes including effective triage mechanisms and transitions between levels of care and services, as well as consultative support between the service providers. All these should furthermore be guided by an understanding of the

cultural and ecological context of Hong Kong, by professional and administrative accountability, quality improvement activities and advocacy. It is hoped that the work of this working group on AD/HD will provide a small enhancement to the momentum of work towards serving Hong Kong children with AD/HD.

Reference:

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed. Text Revision). Washington, DC: American Psychiatric Association.
- Amos A. (2000). A computational model of information processing in the frontal cortex and basal ganglia. *Journal of Cognitive Neuroscience*, 12, 505-519.
- Anastopoulos, A. D., DuPaul, G. J., & Barkley, R. A. (1991). Stimulant medication and parent training therapies for attention deficit-hyperactivity disorder. *Journal of Learning Disabilities*, 24(4), 210-218.
- Anderson, J.C. (1996). Is childhood hyperactivity the product of Western culture? *The Lancet*, 348, 73-74.
- Arnold, L.E. (2002). "Treatment Alternatives for Attention Deficit Hyperactivity Disorder." In *Attention Deficit Hyperactivity Disorder: State of the Science -- Best Practices*, ed. P.S. Jensen and J.R. Cooper. Kingston, N.J.: Civic Research Institute. 13:1-29.
- Arnold L.E., Abikoff H.B., Cantwell D.P., Conners C.K., Elliott G.R., Greenhill L.L., Hechtman L., Hinshaw S.P., Hoza B., Jensen P.S., Kraemer H.C., March J.S., Newcorn J.H., Pelham W.E., Richters J.E., Schiller E.P., Severe J.B., Swanson J.M., Vereen D., Wells K.C. (1997). National Institute of Mental Health Collaborative Multimodal Treatment Study of Children with AD/HD (the MTA). Design challenges and choices. *Archives of General Psychiatry*, 54(9), 865-70.
- Barkley, R. A. (1990b). Comprehensive evaluation of attention deficit disorder with and without hyperactivity as defined by research criteria. *Journal of Consulting and Clinical Psychology*, 58, 775-789.
- Barkley, R. A., & Cunningham, C. E. (1979). The effects of methylphenidate on the mother-child interactions of hyperactive children. *Archives of General Psychiatry*, 36, 201-208.
- Barkley, R. A., Karlsson, J., Pollard, S. & Murphy, J. V. (1985). Developmental changes in the mother-child interactions of hyperactive boys: Effects of two dose levels of Ritalin. *Journal of Child Psychology and psychiatry*, 26, 705-715.
- Barkley, R. A. Karlsson, J., Strzelecki, E., & Murphy, J. (1984). The effects of age and Ritalin dosage on the mother-child interactions of hyperactive children. *Journal of Consulting and Clinical Psychology*, 52, 750-758.
- Barkley, R. A., Fischer, M., Edelbrock, C. S., & Smallish, L. (1990). The adolescent outcome of hyperactive children diagnosed by research criteria: I. An 8-year prospective study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 29, 546-557.
- Barkley R.A. *Defiant Children* (1997): A Clinician's Manual for Assessment and Parent Training. 2nd Ed. New York: Guilford Publications.
- Barkley, R.A. (1998). Attention deficit-hyperactivity disorder. In E. J. Mash & R. A. Barkley

- (Eds.), *Treatment of childhood disorders* (2nd ed., p. 55-110). New York: Guilford Press.
- Barkley, R.A. (2004). Adolescents with Attention-Deficit/Hyperactivity Disorder: An overview of empirically based treatments. *Journal of Psychiatric Practice*, 10, 39-56.
- Barkley, R.A. (2006). Attention Deficit hyperactivity disorder. A handbook for diagnosis and treatment. 3rd addition. Chapter 5, p. 219 – 247. The Guilford Press. New York. London.
- Baving, L., Laucht, M., & Schmidt, M. H. (1999). Atypical frontal brain activation in AD/HD: preschool and elementary school boys and girls. *Journal of the American Academy of Child and Adolescent Psychiatry*, 38, 1363-1371.
- Biederman, J., Faraone, S., Milberger, S., Curtis, S., Chen, L., Marris, A., et al. (1996). Predictors of persistence and remission of AD/HD into adolescence: Results from a four-year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35, 343-351.
- Blazer, B. (1999). Developing 504 classroom accommodation plans: A collaborative systematic parent-student-teacher approach. *Teaching Exceptional Children*, 32, 28-33.
- Bos, C. S. (1999). Home school communication. In C. Jones, H. R. Searight, & M. A. Urban (Eds.), *Parent Articles for ADHD*. San Antonio, TX: Communication Skill Builders.
- Bos, C. S., Nahmias, M. L., & Urban, M. A. (1999). Targeting home-school collaboration for students with ADHD. *Teaching Exceptional Children*, 31, 4-11.
- Bobb A.J., Castellanos F.X., Addington A.M., Rapoport J.L. (2006). Molecular genetic studies of AD/HD: 1991 to 2004. *American Journal of Medical Genetics Part B (Neuropsychiatric Genetics)* 141B, 551-565.
- Braaten E.B., Rosen L.A. (2000). Self-regulation of affect in attention deficit hyperactivity disorder (AD/HD) and non-AD/HD boys: Differences in empathic responding. *Journal of Consulting and Clinical Psychology*, 68, 313-321.
- Brestan, E.V., & Eyberg, S.M. (1998). Effective psychosocial treatment of conduct-disordered children and adolescents: 29 years, 82 studies, and 5272 kids. *Journal of Clinical Child Psychology*, 27, 180-189
- Buchkremer-Ratzmann I., Witte O.W. (1996) Extended brain disinhibition following small photothrombotic lesions in rat frontal cortex. *NeuroReport* 8, 519-522.
- Bymaster, F. P., Katner, J. S., Nelson, D. L., Hemrick-Luecke, S. K., Threlkeld, P. G., Heligenstein, J. H., et al. (2002). Atomoxetine increase extracellular levels of norepinephrine and dopamine in prefrontal cortex of rat: a potential mechanism for efficacy in attention deficit/hyperactivity disorder. *Neuropsychopharmacology*, 27, 399-711.
- Carlson, E. A., Jacobvitz, D., & Sroufe, L. A. (1995). A developmental investigation of inattentiveness and hyperactivity. *Child Development*, 66, 37-54.

- Carter C.S., Braver T.S., Barch D.M., Botvinick M.M., Noll D.C., Cohen J.D. (1998) Anterior cingulate cortex, error detection, and the online monitoring of performance. *Science* 280, 747-749.
- Castellanos, F. X., Lee, P. P., Sharp, W., Jeffries, N. O., Greenstein, D. K., Clasen, L. S., et al. (2002). Developmental trajectories of brain volume abnormalities in children and adolescents with attention-deficit/hyperactivity disorder. *Journal of the American Medical Association*, 288, 1740-1748.
- Collette F., Van der Linden M., Delfiore G., Degueldre C., Luxen A., Salmon E. (2001). The functional anatomy of inhibition process investigated with the Haylingtask. *NeuroImage* 14: 258-267, doi:10.1006/nimg.2001.0846.
- Dempster F.N. (1992). The rise and fall of the inhibitory mechanism: Toward a unified theory of cognitive development and aging. *Dev. Rev.* 12, 45-75.
- Dulcan, M. K., & Benson, R. S. (1997). Summary of the practice parameters for the assessment and treatment of children, adolescents and adults with AD/HD. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36(9), 1311-1317.
- EMB-Whole School Approach to Cater for Students' Diverse Learning Needs, <http://www.emb.gov.hk/index.aspx?nodeID=181&langno=1>
- Faraone S.V., Doyle A.E., Mick E., & Biederman J. (2001). Meta-analysis of the association between the 7-repeat of the dopamine D(4) receptor gene and attention deficit hyperactivity disorder. *American Journal of Psychiatry*, 158, 1052-1057.
- Fergusson, D. M., Fergusson, I. E., Horwood, L., J., & Kinzett, N. G. (1988). A longitudinal; study of dentine lead levels, intelligence, school performance, and behaviour. *Journal of Child Psychology and Psychiatry*, 29, 811-824.
- Gersten, R., & Dimino, J. (2001). The realities of translating research into classroom practice. *Learning Disabilities Research & Practice*, 16, 120-130.
- Gersten, R., Morvant, M., & Brengelman, S. (1995). Close to the classroom is close to the bone: Coaching as a means to translate research into classroom practice. *Exceptional Children*, 62, 52-66.
- Giangreco, M. F., Edelman, S. W., Broer, S. M., & Doyle, M., B. (2001). Paraprofessional support of students with disabilities: Literature from the past decade. *Exceptional Children*, 68(1), 45-63.
- Gilger, J. W., Pennington, B. F., & Defries, J. C. (1992). A twin study of the etiology of comorbidity: attention deficit hyperactivity disorder and dyslexia. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 343-348.
- Gingerich, K. J., Turnock, P., Litfin, J. K., & Rosen, L. A. (1998). Diversity and attention deficit hyperactivity disorder. *Journal of Clinical Psychology*, 54, 415-426.
- Goldenberg, C., & Gallimore, R. (1991). Changing teaching takes more than one-shot workshop. *Educational Leadership*, 49 (3), 69-72.

- Goldman-Rakic P.S. (1987). Circuitry of primate prefrontal cortex and regulation of behaviour by representational memory. In: Plum F, editor. Handbook of physiology. Section 1, The nervous system. 2nd ed, vol 5 pt. 1-2.
- Goodman, J. R., & Stevenson, J. (1989). A twin study of hyperactivity: II. the aetiological role of genes, family relationships, and perinatal adversity. *Journal of Child Psychology and Psychiatry*, 30, 691-709.
- Greenhill, L., & Osman, B. (1999). *Ritalin: Theory and Practice*. New York: Mary Ann Liebert.
- Hamilton, J. L., & McInerny, M. (2000). Reforming schools in an era of increased accountability: A professional development model. Session conducted at the Council for Exceptional Children Annual Convention and Expo. Vancouver, B.C.
- Heung, V.W.K., & Ho, T.P. (2003). *Children with attention deficit hyperactivity disorder*. Hong Kong: CSNSIE, HKIEd.
- Heung, V. (2004). A multi-modal approach for reintegrating students with Attention Deficit Hyperactivity Disorder. In Zaman, S.S., Banu, S., Khan, N.Z., Munir, S.Z., Ferdous, S.(eds). *Creating barrier free inclusive community and rights based society for children with disability*. Proceedings of the Second Regional Seminar on Childhood Disability (pp.110-122). Bangladesh: Bangladesh Protibondhi Foundation.
- Hill, P., & Taylor, E. (2001). An auditable protocol for treating attention deficit/hyperactivity disorder. *Disease in Childhood*, 84(5), 404-409.
- Ho, T.P., Luk, S.L., Leung, P.W.L., Taylor, E., Lieh Mak, F. & Bacon-Shone, J. (1996a). Situational versus pervasive hyperactivity in a community sample. *Psychological Medicine*, 26, 309-321.
- Ho, T.P., Leung, P.W.L., Luk, S.L., Taylor, E., Bacon-Shone, J. & Lieh Mak, F. (1996b). Establishing the constructs of childhood behavioural disturbances in a Chinese population. *Journal of Abnormal Child Psychology*, 24, 417-431
- Huettel S.A., Misiurek J., Jurkowski A.J., McCarthy G. (2004). Dynamic and strategic aspects of executive processing. *Brain Res*, 1000, 78-84.
- Ingersoll, B. (1988). *Your Hyperactive Child*. New York: Doubleday.
- Johnston, C. (2002). The impact of attention deficit hyperactivity disorder on social and vocational functioning in adults. In P.S. Jensen and J.R. Cooper (Eds.), *Attention Deficit Hyperactivity Disorder: State of the Science, Best Practices*. (Chapter 6, p 1-21). Kingston, NJ: Civic Research Institute.
- Kirino E., Belger A., Goldman-Rakic P., McCarthy G. (2000). Prefrontal activation evoked by infrequent target and novel stimuli in a visual target detection task: An event-related functional magnetic resonance imaging study. *Journal of Neuroscience*. 20: 6612-6618.
- Kirley, A., Hawi, Z., Daly, G., McCarron, M., Mullins, C., Millar, N., et al. (2002). Dopaminergic system genes in AD/HD: toward a biological hypothesis.

- Neuropsychopharmacology, 27, 607-619.
- Lee T.M.C., Liu H.L. Feng C.M., Hou J., Mahankali S., Fox P.T., Gao J.H. (2001). Neural correlates of response inhibition for behavioural regulation in humans assessed by functional magnetic resonance imaging. *Neuroscience Letters*, 309, 109-112.
- Leibson C.L., Katusic S.K., Barbaresi W.J., Ransom J., O'Brien P.C. (2001). Use and costs of medical care for children and adolescents with and without attention-deficit/hyperactivity disorder. *The Journal of the American Medical Association*, 285(1), 60-6, 2001 Jan 3.
- Leung, P.W.L. & Connolly, K.J. (1994). Attentional difficulties in hyperactive and conduct-disordered children: a processing deficit. *Journal of Child Psychology and Psychiatry*, 35, 1229-1245.
- Leung, P.W.L. & Connolly, K.J. (1996). Distractibility in hyperactive and conduct-disordered children. *Journal of Child Psychology and Psychiatry*, 37, 305-312.
- Leung, P.W.L. & Connolly, K.J. (1997). Test of two views of impulsivity in hyperactive and conduct-disordered children. *Developmental Medicine & Child Neurology*, 39, 574-582.
- Leung, P.W.L. & Connolly, K.J. (1998). Do hyperactive children have motor organization and/or execution deficits? *Developmental Medicine & Child Neurology*, 40, 600-607.
- Leung, P.W.L., Ho, T.P., Luk, S.L., Taylor, E., Bacon-Shone, J. & Lieh Mak, F. (1996a). Separation and comorbidity of hyperactivity and conduct disturbance in Chinese Schoolboys. *Journal of Child Psychology and Psychiatry*, 37, 841-853
- Leung, P.W.L., Luk, S.L., Ho, T.P., Taylor, E., Lieh Mak, F. & Bacon-Shone, J. (1996b). The diagnosis and prevalence of hyperactivity in Chinese schoolboys. *British Journal of Psychiatry*, 168, 486-496.
- Leung, P.W.L., Kwong, S.L., Tang, C.P., Ho, T.P., Hung, S.F., Lee, C.C., Hong, S.L., Chiu, C.M., & Liu, W.S. (2006). Test-retest reliability and criterion validity of the Chinese version of CBCL, TRF, and YSR. *Journal of Child Psychology and Psychiatry*, 47, 970-973.
- Leung, P.W.L., Lee, C.C., Hung, S.F., Ho, T.P., Tang, C.P., Kwong, S.L., Leung, S.Y., Yuen, S.T., Lieh-Mak, F., Oosterlaan, J., Grady, D., Harxhi, A., Ding, Y.C., Chi, H.C., Flodman, P., Schuck, S., Spence, M.A., Moyzis, R., & Swanson, J. (2005). The dopamine receptor D4 (DRD4) gene in Han Chinese children with attention-deficit/hyperactivity disorder (AD/HD): Increased prevalence of the 2-repeat allele. *American Journal of Medical Genetics (Neuropsychiatric Genetics)*, 133B, 54-56.
- Lhermitte F (1986a): Human autonomy and the frontal lobes: Part I. Patient behavior in complex and social situations: The "environmental dependency syndrome". *Annals of Neurology*; 19, 326-334.
- Lhermitte F (1986b). Human autonomy and the frontal lobes: Part II. Patient behaviour in complex and social situations: the "environmental dependency syndrome." *Annals of Neurology*; 19: 335-343.
- Likins (2002). Effective training for paraprofessionals. *Impact: Feature Issue on Paraeducators*

- Supporting Students with Disabilities and At-Risk, 15(2) [online]. Minneapolis: University of Minnesota, Institute on Community Integration. Available from <http://ici.umn.edu/products/impact/152>.
- Linnet, K. M., Dalsgaard, S., Obel, C., Wisborg, K., Henriksen, T. B., Rodriquez, A., et al. (2003). Maternal lifestyle factors in pregnancy risk of attention deficit hyperactivity disorder and associated behaviours: Review of the current literature. *American Journal of Psychiatry*, 160, 1028-1040.
- Little, J. W., (1987). Teachers as colleagues. In V. Koehler (Ed.), *Educator's handbook: Perspective from research*. New York: Longman.
- Luk, S.L. & Leung, P.W.L. (1989). Conners' Teacher Rating Scale - a validity study in Hong Kong. *Journal of Child Psychology and Psychiatry*, 30, 785-793.
- Luk, S.L., Leung, P.W.L. & Lee, P.L.M. (1988). Conners' Teacher Rating Scale in Chinese children in Hong Kong. *Journal of Child Psychology and Psychiatry*, 29, 165-174.
- Malloy P., Bihrlr A., Duffy J. (1993). The orbitomedial frontal syndrome. *Archives of Clinical Neuropsychology* 8, 185-201.
- Martin, G., & Pear, J. (2006). *Behaviour modification*, 7th Ed. Upper Saddle River, N.J. : Pearson/Prentice Hall.
- Matza L., Paramore C., and Prasad M. (2005). A review of the economic burden of AD/HD. *Cost Effectiveness and Resource Allocation* 2005, 3:5 doi:10.1186/1478-7547-3-5
- McAlonan, G.M., Cheung, V., Cheung, C., Chua, S.E, Murphy, D.G.M., Suckling, J., Tai, K.S., Yip, L.K.C, Leung, P.W.L., & Ho, T.P. (2007). Mapping brain structure in AD/HD: A voxel-based MRI study of regional grey and white matter volume. *Psychiatric Research: Neuroimaging*, 154, 171-180.
- McCarthy G., Luby M., Gore J., Goldman-Rakic P. (1997). Infrequent events transiently activate human prefrontal and parietal cortex as measured by functional MRI. *Journal of Neurophysiology*, 77, 1630-1634.
- Menon V., Adleman N.E., White C.D., Glover G.H., Reiss A.L. (2001). Error related brain activation during a go/nogo response inhibition task. *Human Brain Mapping*, 12, 131-143.
- Mesulam M.M. (2002) The human frontal lobes: transcending the default mode through contingent encoding. In: DT Stuss, Knight RT (eds), *Principles of frontal lobe function*. New York: Oxford University Press
- Milberger, S., Biederman, J., Faraone, S. V., Chen, L., & Jones, J. (1996). Is maternal smoking during pregnancy a risk factor for attention deficit hyperactivity disorder in children? *American Journal of Psychiatry*, 153, 1138-1142.
- Milberger, S., Biederman, J., Faraone, S. V., Guite, J., & Tsuang, M.T. (1997). Pregnancy, delivery, and infancy complications and attention deficit disorder: Issues of gene-environment interaction. *Biological Psychiatry*, 41, 65-75.
- Miller E.K. (2000). The prefrontal cortex and cognitive control. *Nature Review Neuroscience*,

1, 59-65.

- Miranda, A., Presentacion, M. J., & Soriano, M. (2002). Effectiveness of a school-based multicomponent programme for the treatment of children of AD/HD. *Journal of Learning Disabilities*, 35, 546-562.
- MTA Cooperative Group (1999a). A 14 month randomized clinical trial of treatment strategies for attention deficit hyperactivity disorder: multimodal treatment study of children with AD/HD. *Archives of General Psychiatry*, 56(12), 1073-1086.
- MTA Cooperate Group (2004). NIMH Multimodal treatment of AD/HD follow up: 24-month outcome of treatment strategies for AD/HD. *Paediatrics*, 113, 754 – 761.
- Nadder, T. S., Rutter, M., Silberg, J. L., Maes, H. H., & Eaves, L. J., (2002). Genetic effects on the variation and covariation of attention-deficit hyperactivity disorder (AD/HD) and oppositional-defiant disorder/conduct disorder (ODD/CD) symptomatologies across informant and occasion of measurement. *Psychological Medicine*, 32, 39-53.
- Nahmias, M. L. (1995). Communication and collaboration between home and school for students with ADHD. *Intervention in School and Clinic*, 30, 241-247.
- National Joint Committee on Learning Disabilities (1999). Professional development for teachers.
- Needleman, H. L., Gunnoe, C., Leviton, A., Reed, R., Peresie, H., Maher, C., et al. (1979). Deficits in psychologic and classroom performance of children with elevated dentine lead levels. *New England Journal of Medicine*, 300, 689-695.
- No Child Left Behind Act of 2001, PL 107-110, 115 Stat. 1425, 20 U.S.C. §§ 601 et seq.
- Overmeyer, S., Bullmore, E.T., Suckling, J., Simmons, A., Williams, S.C.R., Santosh, P.J., Taylor, E. (2001). Distributed grey and white matter deficits in hyperkinetic disorder: MRI evidence for anatomical abnormality in an attentional network. *Psychological Medicine* 31, 1425-1435.
- Pardo J.V., Pardo P.J., Janer K.W., Raichle M.E. (1990). The anterior cingulate cortex mediates processing selection in the stroop attentional conflict paradigm. *Proceeding of National Academy of Science*, 87, 256-259.
- Petrides M., Pandya D.N. (1999) Dorsolateral prefrontal cortex: comparative cytoarchitectonic analysis in the human and the macaque brain and corticocortical connection patterns. *European Journal of Neuroscience*, 11, 1011-1036.
- Petrides M., Pandya D.N. (2002): Association pathways of the prefrontal cortex and functional observations. In DT Stuss, RT Knight (Eds.), *Principles of frontal lobe function*. New York: Oxford University Press, 31-50.
- Pickett, A. L., Likins, M., & Wallace, T. (2003). *The employment and preparation of paraeducators: The state-of-the-art 2003*. New York: City University of New York, National Resource Centre for Paraprofessionals in Education and Related Human Services, Centre for Advanced Study in Education. (ERIC document ED473398)
- Posner M.I., Digirolamo G.J. (1998). Executive attention: conflict, target detection, and

- cognitive control. In: Parasuraman R (ed), *The attentive brain*. Cambridge, MA: MIT Press; 401-424.
- Posner MI, Rothbart MK (1998). Attention, self regulation and consciousness. *Philosophical Transactions of the Royal Society of London B*; 353: 1915-1927.
- Pisterman, S., McGrath, P. J., Firestone, P., & Goodman, J. T. (1989). Outcome of parent-mediated treatment of preschoolers with attention deficit disorder with hyperactivity. *Journal of Consulting and Clinical Psychology*, 57(5), 628-635.
- Rubia K., Overmeyer S.O., Taylor E., Brammer M., Williams S., Simmons A., et al (1999) Hypofrontality in attention deficit hyperactivity disorder during higher order motor control: a study with fMRI. *American Journal of Psychiatry* ;156(6), 891–6.
- Shek, D.T.L. (1995). Mental health of Chinese adolescents in different Chinese societies. *International Journal of Adolescent Medicine and Health*, 8(2), 117-155.
- Shek, D.T.L. (Ed.). (2002). Special Issue: Research on social work practice in Chinese communities. *Research on Social Work Practice*, 12(4), 485-581. London: Sage Publications.
- Shek, D.T.L., Chan, Y.K., & Lee, P. (Eds.). (2005). *Social Indicators Research Series (vol. 25): Quality of life research in Chinese, Western and global contexts*. The Netherlands: Springer.
- Shek, D.T.L., Lam, M.C., & Tsoi, K.W. (2004). Evidence-based social work practice in Hong Kong. In B. Thyer and M. Kazi (Eds.), *International perspectives on evidence-based practice in social work* (pp.213-222). London: Venture Press.
- Shek, D.T.L., & Tsang, S.K.M. (1993a). Care-givers of preschool mentally handicapped children in Hong Kong: Their stress, coping resources, and psychological well-being. Hong Kong: Heep Hong Society for Handicapped Children.
- Shek, D.T.L., & Tsang, S.K.M. (1993b). Coping responses of Chinese parents with preschool mentally handicapped children. *Social Behaviour and Personality*, 21(4), 303-312.
- Sherman, D. K., Iacono, W. G., & McGue, M. K. (1997). Attention-deficit hyperactivity disorder dimensions: a twin study of inattention and impulsivity-hyperactivity. *Journal of the American Academy of Child and Adolescent Psychiatry*, 36, 745-753.
- Shiu, L. P., & Cheng, P. W. (2006). Towards a model of training teachers of AD/HD students. Paper presented at the Annual Meeting of the Hong Kong Society of Child Neurology and Developmental Paediatrics, November 10-13, Hong Kong.
- Silva, P. A., Hughes, P., Williams, S., & Faed, J. M. (1988). Blood lead, intelligence, reading attainment, and behaviour in eleven year old children in Dunedin, New Zealand. *Journal of Child Psychology and Psychiatry* 29, 43-52.
- So C.Y.C., Bauermeister, J.J., Hung, J.S.F. (2005) *The Integrated Services Programme Task Force. Helping Challenging Children: Treatment Manual*. World Psychiatric Association.
- So C.Y.C., Leung, P.W.L., Hung J.S.F. (2004). *Enhancement of Learning Behaviour Project:*

- Cooperation Between Schools, Families, and Community. 2nd Ed. Hong Kong: Kwai Chung Hospital and Department of Psychology, The Chinese University of Hong Kong.
- Spencer, T., Biederman, J., Wilens, T., Harding, M. et al (1996). Pharmacotherapy of attention-deficit hyperactivity disorder across the life cycle. *Journal of the American Academy of Child & Adolescent Psychiatry*, 35(4), 409-432.
- Sukhodolsky D.G., do Rosario-Campos M.C., Scahill L., Katsov L. (2005). Adaptive, emotional, and family function of children with obsessive-compulsive disorder and comorbid attention deficit hyperactivity disorder. *American Journal of Psychiatry*, 162, 1125-1132.
- Swanson, J. M., McBurnett, K., Wigal, T., Pfiffner, L. J., Lerner, M. A., Williams, L., et al. (1993). Effect of stimulant medication on children with attention deficit disorder: a "review of reviews". *Exceptional Children*, 60, 154-162.
- Swanson, J., Sergeant, J., Taylor, E., et al. (1998). Attention-deficit hyperactivity disorder and hyperkinetic disorder. *The Lancet*, 351, 429-433.
- Szatmari, P., Offord, D. R., & Boyle, M. H. (1989). Ontario Child Health Study: Prevalence of attention deficit hyperactivity disorder with hyperactivity. *Journal of Child Psychology and Psychiatry*, 30, 219-230.
- Tao, K. (1992). Hyperactivity and attention deficit disorder syndromes in China. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 1165-1166.
- Teicher M.H., Anderson C.M., Polcari A., Glod C.A., Maas L.C., Renshaw P.F. (2000): Functional deficits in basal ganglia of children with attention-deficit/hyperactivity disorder shown with functional magnetic resonance imaging relaxometry. *Nature Medicine*, 6, 470-473.
- Thomson, G. O. B., Raab, G. M., Hepburn, W. S., Hunter, R., Fulton, M., & Laxen, D. P. H., (1989). Blood-lead levels and children's behaviour: Results from the Elinburgh lead study. *Journal of Child Psychology and Psychiatry*, 30, 515-528.
- Van den Oord, E. J. C., & Rowe, D. C. (1997). Continuity and change in children's social maladjustment: A developmental behaviour genetic study. *Developmental Psychology*, 33, 319-332.
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- World Health Organization. (1996). *Multiaxial classification of child and adolescent psychiatric disorders*. Cambridge: Cambridge University Press.
- Weiss, G., & Hechtman, L., (1993). *Hyperactive children grown up* (2nd ed.). New York: Guilford Press.
- Welner, Z., Welner, A., Stewart, M., Palkes, H., & Wish, E.(1997). A controlled study of siblings of hyperactive children. *Journal of Nervous and Mental Disease*, 165, 110-117.
- Willis, T. J., & Lovaas, I. (1977). A behavioural approach to treating hyperactive children: The parent's role. In J. B. Millichap (Ed.), *Learning disabilities and related disorders* (pp.

- 119-140). Chicago: Year Book Medical.
- Williams, V. I., & Cartledge, G. (1997). Passing notes to parents. *Teaching Exceptional Children*, 30, 30-34.
- Wong D.F., Wagner H.N., Tune L.E., Dannals R.F., et al.(1986): Positron emission tomography revealed elevated D2 receptors in drug-native schizophrenics. *Science* 234, 1558-1563.
- Zentall, S. S. (1993). Research on the educational implications of attention deficit hyperactivity disorder. *Exceptional Children*, 60, 143-153.
- Zentall, S.S. (2005). Theory- and evidence-based strategies for children with attentional problems. *Psychology in the Schools*, 42, 821-836.

Other reference provided by Mr. Joseph Lau:

- Pelham, W. E., Fabiano, G.A. and Massetti, G.M (2005). Evidence-Based Assessment of Attention Deficit Hyperactivity Disorder in Children and Adolescents. *Journal of Child and Adolescent Psychology*, Vol. 34, No. 3, 449-476.
- American Academy of Paediatrics (2000) Clinical Practice guideline: Diagnosis and Evaluation of the Child with Attention Deficit Hyperactivity Disorder. *Paediatrics*, Vol. 105, No.5.
- Brown, Thomas E. (2005). *Attention Deficit Disorder: The Unfocused Mind in Children and Adults*. Yale University Press,.
- Wender, Paul H. (2000). *AD/HD: attention-deficit hyperactivity disorder in children and adults*. New York: Oxford University Press.

Other Official Documents provided by Dr. CW Chan:

1. MBBS Curriculum, Medical Faculty, the University of Hong Kong 2006
2. MBBS Curriculum, Medical Faculty, the Chinese University of Hong Kong 2006
3. Postgraduate Training in Paediatrics, Hong Kong College of Paediatricians 1993
4. Updated Postgraduate Training in Paediatrics, Hong Kong College of Paediatricians 2006
5. Report on the “Survey of Child Mental Health Services amongst Paediatricians in Hong Kong 2005”, Task Force on Childhood Mental Health Services in Hong Kong
6. The “Four-Tier Systems for Management of Childhood Mental Health Services in Hong Kong, Dr. SL Luk and Dr. William Wong, Report from the Task Force on Childhood Mental Health Services in Hong Kong 2007
7. Advisory Report on Establishment of “Community Paediatrics in Hong Kong” by Professor Leon Polnay 2006, commissioned by the Hong Kong College of Paediatricians
8. Manpower Requirement for Paediatricians in Hong Kong, Dr. CB CHOW, Manpower Requirement Projection in Hong Kong, Hong Kong College of Paediatricians 2001

9. Report on “Comprehensive Child Surveillance Services (CCDS) in Hong Kong”, Dr. Patrick Ip, Seminar on “Community Child Health” on 18th November 2006, Hong Kong College of Paediatricians.

Appendix 1

Box 1. DSM-IV Diagnostic Criteria for Attention Deficit/Hyperactivity Disorder (APA, 1994)

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 organizing 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 developmental 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 inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)
- (d) often has difficulty playing or engaging in leisure activities quietly
- (e) is often "on the go" or often acts as if "driven by a motor"
- (f) often talks excessively

Impulsivity

- (a) often blurts out answers before questions have been completed
- (b) often has difficulty awaiting turn
- (c) 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:

314.01 Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months

314.00 Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if Criterion A1 is met but Criterion A2 is not met for the past 6 months

314.01 Attention-Deficit/ Hyperactivity Disorder, Predominantly Hyperactive-Impulsive Type: if Criterion A2 is met but Criterion A1 is not met for the past 6 months.

Box 2. ICD-10 Diagnostic Criteria for Hyperkinetic Disorders (WHO, 1996)

- A. Inattention: at least six of the following symptoms of inattention have persisted for at least 6 months, to a degree that is maladaptive and inconsistent with the developmental level of the child:
- (1) Often fails to give close attention to details, or makes careless errors in schoolwork, work or other activities;
 - (2) Often fails to sustain attention in tasks or play activities;
 - (3) Often appears not to listen to what is being said to him or her;
 - (4) often fails to follow through on instructions or to finish schoolwork, chores or duties in the workplace (not because of oppositional behaviour or failure to understand instructions);
 - (5) is often impaired in organizing tasks and activities;
 - (6) often avoids or strongly dislikes tasks, such as housework, that require sustained mental effort;
 - (7) often loses things necessary for certain tasks or activities, such as school assignments, pencils, books, toys or tools;
 - (8) is often easily distracted by external stimuli
 - (9) is often forgetful in the course of daily activities.
- B. Hyperactivity: at least three of the following symptoms of hyperactivity have persisted for at least 6 months, to a degree that is maladaptive and inconsistent with the developmental level of the child:
- (1) often fidgets with hands or feet or squirms on seat;
 - (2) leaves seat in classroom or in other situations in which remaining seated is expected;
 - (3) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, only feelings of restlessness may be present);
 - (4) is often unduly noisy in playing, or has difficulty in engaging quietly in leisure activities;
 - (5) exhibits a persistent pattern of excessive motor activity that is not substantially modified by social context or demands.
- C. Impulsivity: at least one of the following symptoms of impulsivity has persisted for at least 6 months, to a degree that is maladaptive and inconsistent with the developmental level of the child:
- (1) often blurts out answers before questions have been completed;
 - (2) often fails to wait in lines or await turns in games or group situations;
 - (3) often interrupts or intrudes on others (e.g., butts into others' conversations or

games);

(4) often talks excessively without appropriate response to social constraints.

D. Onset of the disorder is no later than the age of 7 years.

E. Pervasiveness: the criteria should be met for more than a single situation, e.g., the combination of inattention and hyperactivity should be present both at home and at school, or at both school and another setting where children are observed, such as a clinic (evidence for cross-situationality will ordinarily require information from more than one source; parental reports about classroom behaviour, for instance, are unlikely to be sufficient).

F. The symptoms in A-C cause clinically significant distress or impairment in social, academic or occupational functioning.

G. The disorder does not meet the criteria for pervasive developmental disorders, manic episode, depressive episode, or anxiety disorders.

F90.0 : Disturbance of activity and attention

Attention Deficit:

- Disorder with hyperactivity
- Hyperactivity disorder
- Syndrome with hyperactivity
- Excludes: hyperkinetic disorder associated with conduct disorder (F90.1)

F98.8 : Other specified behavioural and emotional disorders with onset usually occurring in childhood and adolescence

- Attention deficit disorder without hyperactivity

Box 3. Outcome and Cost to Society

<p>Nature of Cost</p> <p>Who Bears Cost</p>	<p>Less effectiveness in acquiring life Skills</p>	<p>Lost income or economic opportunities for gainful employment</p>	<p>Lower quality of social activity</p>	<p>Treatment cost: Drugs, doctors' time, equipment (both direct AD/HD-related costs and indirect AD/HD-prompted costs due to other health problems)</p>	<p>Coping Cost in the form of Extra staff and other resources</p>
<p>Patient: current year/Future years</p>	<p>Adverse effects on life skills in general</p>	<p>Adverse effects on employment; greater chance of criminal activities</p>	<p>Adverse effects on building relationships</p>	<p>Both mental and physical problems, including accidents, are more likely, resulting in higher medical costs. The AD/HD group showed a significantly greater prevalence of oppositional, conduct, and substance abuse disorders, and greater illegal substance use than control adults.</p>	<p>Not applicable</p>
<p>Family:Parents/Siblings</p> <p>Current year</p> <p>Future years</p>	<p>Takes away time and energy from upgrading one's job skills and pursuing own interests</p>	<p>Parents suffer financial loss because of adverse career and employment effects</p>	<p>Adverse effects on social life</p>	<p>Mental stress; more chances for accidents</p>	<p>Serious coping costs</p>
<p>School</p>	<p>Not Applicable</p>	<p>Not Applicable</p>	<p>Not Applicable</p>	<p>Not Applicable</p>	<p>Huge demands on staff to cope, affecting staffing, routines, etc.</p>

