

Through Training Early Identification and Intervention of ASD in Children Using AI-based Assessment and VR-based training

Dr. Fanny Wai Fan LAM

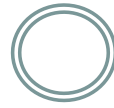
Dr LIU Kam Tim

Wai Pong

Asia Pacific Child Development Training Centre



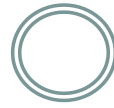
What is ASD



- Autism Spectrum Disorder (ASD) refers to a range of conditions characterized by some degree of impaired social behaviour, communication and language, and a narrow range of interests and activities that are both unique to the individual and carried out repetitively.
- ASDs begin in childhood and tend to persist into adolescence and adulthood. In most cases the conditions are apparent during the first 5 years of life.
- Individuals with ASD often present other co-occurring conditions, including epilepsy, depression, anxiety and attention deficit hyperactivity disorder (ADHD). The level of intellectual functioning in individuals with ASDs is extremely variable, extending from profound impairment to superior levels.

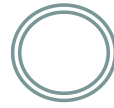


Significance of the problem



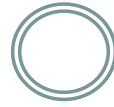
- Prevalence: 1% worldwide
- Prevalence in China?
- Current shortcomings:
 - Lack of clinician in china
 - Long waiting time for diagnosis and treatment because the diagnosis is clinician dependent
 - Parents lack education to support their children
- Lost of the golden time of diagnosis and treatment

Treatment and Management



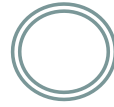
- Medication treatment is available!
- Recent Shanghai study demonstrated
 1. A randomized controlled trial of bumetanide in the treatment of autism in children
 - E Lemonnier, C Degrez, M Phelep, R Tyzio, F Josse, M Grandgeorge, N Hadjikhani & Y Ben-Ari
 - Translational Psychiatry volume 2, pagee202(2012)
 2. Symptom improvement in children with autism spectrum disorder following bumetanide administration is associated with decreased GABA/glutamate ratios
 - Lingli Zhang, Chu-Chung Huang, Yuan Dai, Qiang Luo, Yiting Ji, Kai Wang, Shining Deng, Juehua Yu, Mingyu Xu, Xiujuan Du, Yun Tang, Chun Shen, Jianfeng Feng, Barbara J Sahakian, Ching-Po Lin & Fei Li
 - Translational Psychiatry volume 10, Article number: 9 (2020)

Treatment and Management (Con't)



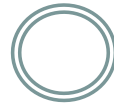
- Applied Behavioural Analysis
- Sensory Integration treatment (touch, joint compression, Therapeutic listening)
- Parent education
- School support

How AI helps to screen or diagnose ASD



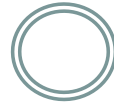
- Send out and rate parents/teachers questionnaire
- Analyze the video of children's behavior with specific tasks given
- Current assessment tools include:
 - ADOS
 - Sally and Ann
 - Happe Strange Stories

Advantage of using AI and big data



- Standardized assessment (all can be done using AI)
- Big data to be sent on cloud
- Tailor made treatment according to the assessment and progress
- Offer interactive parent education

How VR helps to treat

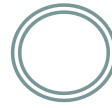


- Social cognition
- Motor learning
- Sensory processing
- Phobia

Recently, Korean uses AI to help grieving mom



Reference



- <https://molecularautism.biomedcentral.com/articles/10.1186/s13229-018-0246-0>
- https://link.springer.com/chapter/10.1007%2F978-3-030-23563-5_15
- <https://link.springer.com/article/10.1007/s10803-019-04246-z>
- <https://dl.acm.org/doi/10.1145/3209687>

Thank You



www.hkdpc.com

devel♥pmental
paediatrics
neurology