PERSONS WITH INTELLECTUAL DISABILITIES 3
https://doi.org/10.33591/sfp.50.8.u5

Unit No. 5

ORAL HEALTH FOR PERSONS WITH INTELLECTUAL DISABILITY: A SIMPLE APPROACH IN PRIMARY CARE

Dr Lim Guang Xu David, Ms Ang Wen Rui Deline

ABSTRACT

This article provides a brief review of oral health in persons with intellectual disability (PWIDs) within Singapore, and considerations for the family physician.

The oral health status of PWIDs appears poorer than neurotypical Singaporeans. Oral health issues have a significant effect on a person's general health and can worsen risk of certain chronic medical conditions such as diabetes mellitus and pneumonia. Multiple barriers affect PWIDs' pathway to dental care, and this can be categorised into six barriers as described by the British Dental Association's case mix tool.

The medical physician may be the first healthcare professional to pick up on the atypical presentation of dental problems in PWIDs. Adequate history-taking, understanding how barriers affect health-seeking, cross-disciplinary communication, and advocating for oral health's importance can all support PWIDs achieve appropriate dental care. This justly helps our society achieve oral health, and health equity for PWIDs.

Keywords: Intellectual Disability; Family Physician; Oral Health; Singapore; Review; Interdisciplinary Communication

SFP2024; 50(8): 26-31

INTRODUCTION

Epidemiology of Oral Health

Dental caries and periodontal diseases, considered global pandemics, are thought to be highly prevalent in persons with intellectual disability (PWIDs) within Southeast Asian countries.[1-4] According to local screening results and surveys, PWIDs who are older, institutionalised (**Table I**; see also **Figure I**), and of lower socio-economic status tend to have poorer oral health.[4,5]

DR LIM GUANG XU DAVID
National Dental Research Institute Singapore, National Dental Centre Singapore
Restorative Dentistry, National Dental Centre Singapore
Oral Health Academic Clinical Programme, Duke-NUS Medical School
Special Oral Care Network

MS ANG WEN RUI DELINE
MINDS Developmental Disabilities Medical Clinic
MINDS SG Limited

IMPORTANCE OF ORAL HEALTH IN GENERAL HEALTH

Oral health is strongly linked to aspects of general health. For example, periodontal inflammation, akin to an open wound, induces bacteraemia. This releases pro-inflammatory mediators into the bloodstream, resulting in a systemic inflammatory response.[6,7] This hypothesis may explain the associations between oral diseases and conditions such as diabetes mellitus, hypertension, vascular diseases, Alzheimer's disease, Parkinson's disease, infective endocarditis, and failure of implantable medical devices.[6-9] Specifically, numerous studies have shown that periodontal health and diabetes share a bi-directional relationship.[6] Successful periodontal treatment can improve blood sugar control, with similar effect as a single anti-diabetic medication. Improving diabetic condition likewise also improves gum health.[6,7]

Additionally, losing teeth, either due to periodontal diseases or dental caries, can affect self-confidence, mastication, speech, and swallowing. Having less than 20 teeth is an indicator of oral frailty, which then leads to unsustainable oral functions and a rapidly deteriorating oral environment.[10] Poor oral hygiene, particularly in those institutionalised with dysphagia, is a risk factor for pneumonia.[11] High-quality weekly oral care was reported to reduce pneumonia hospitalisation by over 50 percent in both local and international programmes.[12,13]

BARRIERS TO DENTAL CARE AND ORAL HEALTH

PWIDs tend to present with poorer oral health outcomes than neurotypical persons due to various barriers. These barriers can be divided into six categories according to the British Dental Association (BDA) case mix model, namely:

- ability to communicate;
- ability to cooperate;
- medical status;
- oral disease risk (likeliness of disease but not current dental status);
- accessibility to dental services; and
- ethical-legal-social barriers.[3,14]

Table II illustrates an example on how we can conceptualise complexities for a person with Down's syndrome.

Table I. Comparison of Age, Oral Health Status, and Service Considerations for PwID Facilities in Singapore (updated from Lim & Yang, 2020)

Facilities	Mean Age (years)	Number Seen (n)	Mean Teeth Left (n)	Mean Decayed/ Missing/Filled teeth	Edentulism Prevalence	Periodontal Disease Prevalence	Average Dental Treatment Needed in Those with Teeth			Service Considerations	
							Extraction per Pax (n)	Fillings per Pax (n)	Scaling/ Periodontal Therapy (%)	Wheelchair Users	Needing Sedation or GA
PwID in a Private Dental Service	16.7	24	26.9	1.5/0.3/0.8	0%	0%	0.7	1.3	87%	8.3%	37.5%
Autism Day Centre	21.7	24	28.1	0.1/0.5/0.2	0%	0%	0.2	0.2	67%	0%	33%
PwID Training Centre 1	27.1	30	23.1	1.8/3.8/0.9	0%	23.3%	1.9	0.83	55%	0%	37%
PwID Training Centre 2	28.3	26	26.5	1.3/1.7/0.3	0%	28%	1.3	0.6	76%	0%	35%
PwID Day Centre	30.2	30	25.4	3.2/2.1/0.8	0%	33.3%	2.2	1.5	76%	13%	30%
Mixed Disability Day Centre	31.3	29	-	2.8/2.0/2.0	0%	-	2.7	3.2	72%	52%	14%
Employment Centre for PwID	32.1	163	24.7	1.8/3.2/1.4	3.1%	26.3%	1.7	1.6	86%	0%	4.3%
PwID Residence 1	48.9	101	13.2	4.4/9.6/0.5	13%	42.5%	4.0	1.3	82%	6.9%	15%
PwID Residence 2	52.2	103	12.3	3.5/14/0.5	22.4%	48%	3.1	1.3	85%	35%	34%

Figure I. Extreme oral condition for a PwID in a local nursing home.

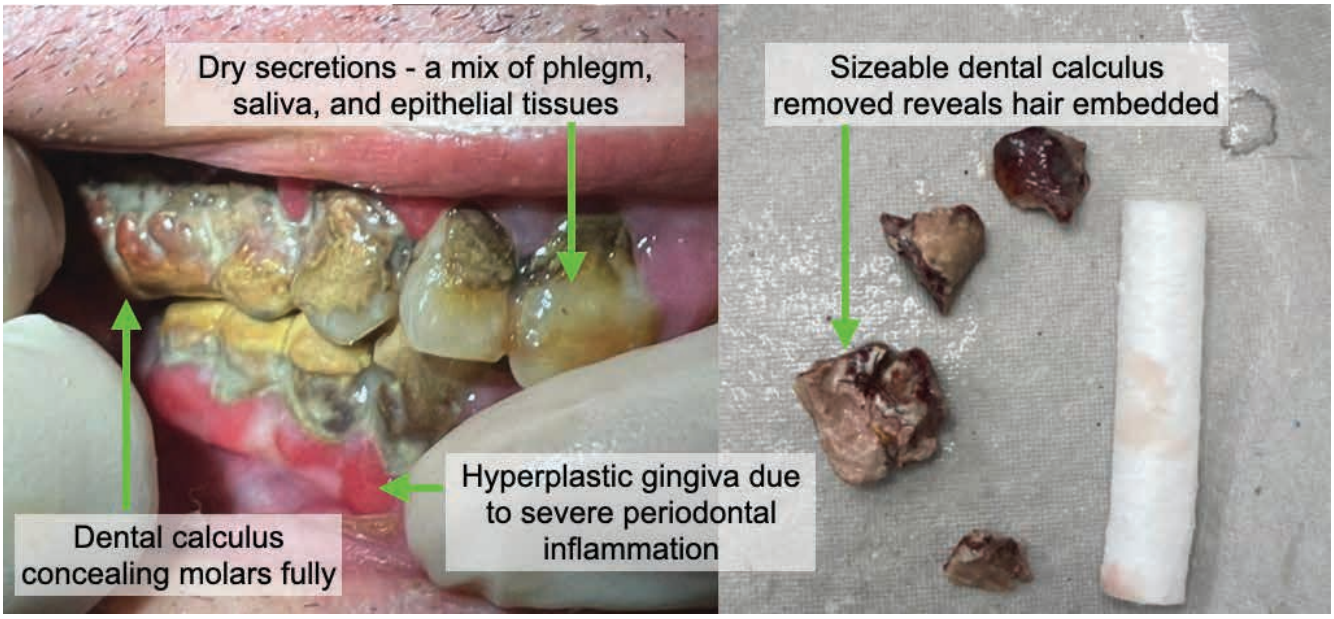

Table II. Illustration of patient-specific barriers that can impede dental care and oral health for a person with Down's syndrome, adapted from the BDA case mix model.[8,14]

Category Of Barriers	Possible Barriers Faced By A Person With Down's Syndrome In Dental Care
Ability to communicate	• Impairment of receptive or expressive communication • Premature hearing loss or impacted ear wax • Visual impairment due to cataract, refractive disorders, or retinal abnormalities
Ability to cooperate	• Cooperative difficulties can be due to anxiety, pain, poor experiences, psycho-emotional disorders, or neurodegenerative conditions
Medical status	• Atlanto-axial joint instability, macroglossia, obesity, and anaemia can be concerns during dental GA • Cardiac defects requiring antibiotic prophylaxis prior to dental extractions • Neutrophil dysregulation affecting dental infections and surgical healing • Early presentation of conditions such as chronic leukaemia, osteoporosis, etc that require dental clearance prior to medical therapy
Oral disease risk	• Anti-epileptic medications can result in gingival hyperplasia, a unique presentation of periodontal disease • Malformed teeth, poorer manual dexterity, mouth breathing can increase risk of dental decay • Sleep apnea and bruxism can increase tooth wear
Accessibility	• Requiring an accompanying person for dental treatment • Flat-feet and bunion affect ambulating
Ethical-legal-social barriers	• Treatment decisions are made in accordance to the Mental Capacity Act • Dental treatment costs are partially subsidised in Singapore, and with extensive treatment need can sometimes be prohibitive

PHYSICIAN'S ROLE IN ORAL HEALTH

When PWIDs present at the doctor's, there can occasionally be undiagnosed and confounding dental problems. From the authors' experience, dental issues in PWIDs can first present as:

- behavioural or mood changes;
- poor appetite, food rejection, or weight loss;
- self-injurious behaviour, such as head banging, jaw slapping; and
- oral sensory seeking such as chewing on inedible objects.

History-taking on previous dental visits or oral hygiene compliance can shed some light on potential dental issues, even when intraoral check is not always possible. A referral can then be made to an appropriate dental service – to exclude dental problems or provide necessary treatment.

The BDA case mix tool can be used as a framework to inform a PWID's pathway to dental care. For example, a fully homebound person would require referral to a domiciliary dental service.[15] Someone with profound cooperation difficulties (requiring general anaesthesia) or with medical complexities may warrant a direct referral to hospital-based special care dental services (refer to **Table III**). Other PWIDs will benefit from having their mental capacity assessed or seeking social work support prior to attending the dental clinic. Nonetheless, the majority of PWIDs should be able to receive appropriate dental treatment with general dentists and oral health therapists.

Cross-disciplinary communication that medical physicians provide helps PWIDs achieve better health outcomes. This may need significant and frequent efforts to liaise with medical specialists, dentists, oral health therapists, nurses, allied health professionals, social workers, and the wider caregiving circle. Provision of updated medical history and medication is also a fundamental need for dental treatment planning for PWIDs, particularly since health records are not yet fully integrated. Other examples of cross-disciplinary work for PWIDs include blood taking, optometry screening (refer to **Figure IIa**), or even nail cutting (refer to **Figure IIb**) during dental sedation.[15]

One simple yet key support a physician can provide is to advocate for oral health and its importance to PWIDs and their caregiving circle. There may be many priorities in a PWID's health journey, financial considerations, or a lack of general health literacy. However, starting on adequate preventive strategies and simple treatment can greatly improve oral health status many decades later.[8] Therefore, early interventions could prevent costly and extensive procedures, as well as the adverse health effects of prolonged dental diseases.

Table III. List of public dental services with special care/needs-qualified dentists. These clinicians provide for adult PwID and medically-complex persons who need an expert level of care. (updated as of 01 July 2024)

For children PwID aged 12 and below who similarly require more expertise, please approach paediatric dentists.

Dental Services	Fee Structure	Referral For Subsidy
Geriatric and special needs dental clinic, National Dental Centre Singapore	Subsidised and Private	CHAS referral Polyclinic referral Internal referral
National University Hospital	Subsidised and Private	CHAS referral Polyclinic referral
Dental Clinic, Tan Tock Seng Hospital	Private	N.A.

Figure IIa. Cross-disciplinary work – MINDS optometry support for a PwID during dental sedation.

Figure IIb. Cross-disciplinary work – Finger- and toenail-clipping for a sedated PwID at a charity dental clinic with help of volunteers and dermatologist.

CONCLUSION

Achieving health equity for PWID is an obligation under international human rights law; similarly for oral health.[16] While our society has yet to attain this, we as healthcare professionals have the privilege of supporting our patients achieve a healthier and better life.

REFERENCES

1. Global Burden of Disease Collaborative Network. Global Burden of Disease Study 2019. Seattle: Institute of Health Metrics and Evaluation (IHME); 2020. Available from http://ghdx.healthdata.org/gbd-results-tool.
2. Lim GXD, Hamzah SZ, Bernardino RRM, Sukhumalind P, Ishak NS, Adiwoso AW. Disability and oral health in the Association of Southeast Asian Nations - A survey for conceptualisation and development. Proceedings of Singapore Healthcare. 2022;31. doi:10.1177/20101058221111579
3. Teo CHK, Mahesh M, Lim GXD. Oral health status and barriers to care in a multiethnic mixed disability center: Rethinking disability community dental services. Spec Care Dentist. 2020 Jul;40(4):344-355. doi: 10.1111/scd.12483. Epub 2020 Jun 5. PMID: 32501578.
4. Lim GXD, Yang JR. Oral Health Status of Adults with Disabilities in Singapore Preliminary Results of CASA-MODAL. Poster Presented - International Association of Disability and Oral health Congress, Dubai, UAE. Sep 2020. doi: 10.13140/RG.2.2.36269.51680. Available from www.researchgate.net/publication/345602881_Oral_Health_Status_of_Adults_with_Disabilities_in_Singapore_Preliminary_Results_of_CASA-MODAL#read
5. Tan SHX, Lee GKY, Goh CE, et al. Impact of income and financial subsidies on oral health care utilization among persons with disabilities in Singapore. Community Dent Oral Epidemiol. 2024 Jun;52(3):336-343. doi: 10.1111/cdoe.12962. Epub 2024 Apr 21. PMID: 38644526.
6. Borgnakke WS, Ylöstalo PV, Taylor GW, Genco RJ. Effect of periodontal disease on diabetes: systematic review of epidemiologic observational evidence. J Clin Periodontol. 2013 Apr;40 Suppl 14:S135-52. doi: 10.1111/jcpe.12080. PMID: 23627324.
7. Borgnakke WS, Genco RJ. Periodontal disease and diabetes mellitus. In International Textbook of Diabetes Mellitus (eds R.A. DeFronzo, E. Ferrannini, P. Zimmet and K.G.M.M. Alberti). Wiley Online Library; 2015. doi.org/10.1002/9781118387658.ch68
8. Diz Dios P, Kumar N. A Practical Approach to Special Care in Dentistry. UK: Wiley-Blackwell; 2022.
9. Lim GXD. Deep Brain Stimulation: literature review of the unseen challenges to optimal dentistry. J Disab Oral Health. 2017;18(2):31-42. doi:10.443/JDOH_Lim12
10. Tanaka T, Takahashi K, Hirano H, et al. Oral Frailty as a Risk Factor for Physical Frailty and Mortality in Community-Dwelling Elderly. J Gerontol A Biol Sci Med Sci. 2018 Nov 10;73(12):1661-1667. doi: 10.1093/gerona/glx225. PMID: 29161342.
11. Son M, Jo S, Lee JS, Lee DH. Association between oral health and incidence of pneumonia: a population-based cohort study from Korea. Scientific Rep. 2020 Jun 12;10(1):9576. doi: 10.1038/s41598-020-66312-2. PMID: 32533077; PMCID: PMC7293333.
12. Subramaniam J, Mohamad Noor NA, Toh E, Tan HS, Lim GXD. Professional Oral Care Intervention in Nursing Homes - an audit of a community-based pilot programme for pneumonia prevention in Singapore. Oral Presented - Malaysia International Dental Exhibition and Conference, Kuala Lumpur, Malaysia. Aug 2023. Available from https://youtu.be/pV2DwcGE2Ao
13. Chiang TC, Huang MS, Lu PL, Huang ST, Lin YC. The effect of oral care intervention on pneumonia hospitalization, Staphylococcus aureus distribution, and salivary bacterial concentration in Taiwan nursing home residents: a pilot study. BMC Infect Dis. 2020 May 27;20(1):374. doi: 10.1186/s12879-020-05061-z. PMID: 32460697; PMCID: PMC7251833.
14. Bateman P, Arnold C, Brown R, et al. BDA special care case mix model. Br Dent J. 2010 Apr 10;208(7):291-6. doi: 10.1038/sj.bdj.2010.294. PMID: 20379244.
15. Lim GXD. Domiciliary Dental Treatment under Oral Sedation for a Senior with Learning Disability and Agoraphobia – a Case Report. SAAD Digest. 2022 Feb 24;38:98-102. ISSN: 0049-1160.
16. WHO. Global report on health equity for persons with disabilities. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO. Available from https://www.who.int/publications/i/item/9789240063600

LEARNING POINTS

- **Oral health is an important aspect of general health.**
- **This can often be overlooked in persons with intellectual disability (PWIDs) due to barriers to care.**
- **Physicians have an important role in advocating for oral health in PWIDs and supporting their care journey.**