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2022 ANNUAL SEMINAR

# Special Care Advocates in Dentistry 2023 Lit. Review

SAID's Search of Dental Literature Published in Calendar Year 2022



Compiled by: Dr. Kimberly Espinoza Dr. Scott Howell

# Search Method

Recent journal articles related to oral health for people with disabilities and medical complexity

PubMed (Medline); Limits: English, 2022 & Journal of American Dental Association; 2022 & Special Care in Dentistry; 2022





# Search Terms

# Stand-alone disability terms: Dental Care for Disabled [Mesh] Dental Care for Chronically III [Mesh] Dental Care for Aged [Mesh] Dental Service, Hospital [Mesh] Keywords: special care dentistry; special needs dentistry

# Search Terms

**Disability-terms combined with dental terms:** Disabled Persons [Mesh]; Chromosome Disorders [Mesh]; Brain Diseases [Mesh] NOT Brain Abscess [Mesh]\* Mental Disorders [Mesh]; Mental Health [Mesh] Communication Disorders [Mesh]; Seizures [Mesh]; Enteral Nutrition [Mesh]; Self-Injurious Behaviors [Mesh] Keywords: disability, disabled, special needs, Down syndrome, cerebral palsy, intellectual disability, autism, autistic, mental illness, "special health care needs"\*\*, "mentally ill", "brain health"\*\*\*, polypharmacy\*\*\*\*

Changes from 2022 to 2023 search

\*/\*\* +4 articles

\*\* +5 articles

\*\*\* + 15 articles



# Mesh Example

Not a complete list of Mesh Terms under Mental Disorders

# **Anxiety Disorders Bipolar and Related Disorders** Disruptive, Impulse Control, and Conduct Disorders **Dissociative Disorders** Feeding and Eating Disorders **Mood Disorders** Motor Disorders **Neurocognitive Disorders Neurodevelopmental Disorders** Neurotic Disorders **Personality Disorders** Schizophrenia Spectrum and Other Psychotic Disorders Substance-Related Disorders Trauma and Stressor Related Disorders

**Mental Disorders [Mesh]:** 

# Search Terms

# Sedative terms combined with dental terms:

Conscious Sedation [Mesh]; Deep Sedation [Mesh]; Nitrous Oxide [Mesh] Anesthesia, General [Mesh]; Anesthesia, Intravenous [Mesh] Keywords: sedation, general anesthesia

## Other terms combined with dental terms:

Immobilization [Mesh]; Antibiotic Prophylaxis [Mesh] Gastroesophageal Reflux [Mesh]; Gagging [Mesh] Keywords: medical restraint, medical immobilization, protective stabilization, behavioral management, behavior management, behavioral support, behavior support, GERD

# Search Terms

### Stand-alone other terms:

Gingival Overgrowth [Mesh] Silver Diamine Fluoride [Supplementary Concept] Macroglosia, olidogonita, hypodontia, anodontia\*

Cleft Palate [Mesh], Cleft Lip [Mesh], "cleft lip", cleft palate\*\* [Limit = systematic review]

Changes from 2022 to 2023 search \* +153 articles \*\* +82 articles

# Search Terms & Mesh Example

**Dental terms:** 

Dental Health Services [Mesh] Dentistry [Mesh] Oral Health [Mesh] Stomatognathic Diseases [Mesh]\* Keywords: dental care

Stomatognathic Diseases [Mesh]:

Ankyloglossia Jaw Diseases Mouth Diseases Pharyngeal Diseases (removed) Stomatognathic System Abnormalities Temporomandibular Joint Disorders Tooth Diseases (\*Bruxism reviewed separately)

# Search Terms & Mesh Example

("Dental Care for Disabled" [Mesh] OR "Dental Care for Chronically III" [Mesh] OR "Dental Care for Aged" [Mesh] OR "Dental Service, Hospital"[Mesh] OR "special care dentistry" OR "special needs dentistry") OR ("silver diamine fluoride"[Supplementary Concept] OR "gingival overgrowth"[Mesh] OR "bruxism"[Mesh] OR macroglossia OR oligodontia OR hypodontia OR anodontia) OR (("Immobilization" [Mesh] OR "medical restraint" OR "medical immobilization" OR "protective stabilization" OR "behavior management" OR "behavioral management" OR "behavioral support" OR "behavior support" OR "antibiotic prophylaxis" [Mesh] OR "gastroesophageal reflux" [Mesh] OR "GERD" OR "polypharmacy" OR "Sedation" OR "General anesthesia" OR "Nitrous oxide" [Mesh] OR "Conscious Sedation" [Mesh] OR "Deep sedation" [Mesh] OR "Anesthesia, General" [Mesh] OR "Anesthesia, Intravenous" [Mesh] OR "Gagging" [Mesh] OR "Seizures"[Mesh] OR "Enteral Nutrition"[Mesh] OR "Self-Injurious Behavior"[Mesh]) AND ("Dental Health Services" [Mesh] OR "Dentistry" [Mesh] OR "Oral Health" [Mesh] OR ("Stomatognathic Diseases" [Mesh] NOT "Pharyngeal Diseases" [Mesh]) OR "dental care") ) OR (("Special Health Care Needs" OR "Disabled Persons" [Mesh] OR "Mental Disorders" [Mesh] OR "Mental Health" [Mesh] OR "Disability Studies" [Mesh] OR "Communication Disorders" [Mesh] OR "Chromosome Disorders" [Mesh] OR ("Brain Diseases" [Mesh]) OR "Down syndrome" OR "cerebral palsy" or "autism" OR "autistic" OR "intellectual disability" OR "mental illness" OR "mentally ill" OR "brain health" OR "disability" OR "disabled" OR "special needs") AND ("Dental Health Services" [Mesh] OR "Dentistry" [Mesh] OR "Oral Health" [Mesh] OR ("Stomatognathic Diseases" [Mesh] NOT "Pharyngeal Diseases" [Mesh]) OR "dental care") )\*

Limits: Humans, English, 2022 = 1409  $\rightarrow$  1370 articles results on 6/5/2023

\*Cleft search done separately

# Results

# **Initial Search Results:**

1618 titles reviewed (1370 PubMed, 74 SCD, 174 JADA)

# **First Round Review:**

473 abstracts reviewed (402 PubMed, 51 SCD, 20 JADA)

# **Second Round Review:**

51 full articles reviewed (47 PubMed, 3 SCDA, 1 JADA)

# The 100 most-cited papers in dentistry for individuals with neurodevelopmental disorders

Qualitative evaluation of YouTube videos on dental fear, anxiety and phobia

Is **periodontitis** associated with age-related **cognitive impairment**? The systematic review, **confounders assessment** and meta-analysis of clinical studies

> Effect of **silver diamine fluoride** on **hyperplastic gingivitis** in an adult with intellectual disability: A case report

Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# **#1. Literature Search**

Web of Science: "Dentistry, Oral Surgery & Medicine"

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Keywords from ICD-11 related to neurodevelopmental disabilities or developmental anomalies Exclusion: birth defects (e.g. cleft palate)

# **#2. Ordered by Number of Citations**

a) Web of Science: Core Collection Databaseb) Scopus c) Google Scholar

# **#3.** Analysis

Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

#### Supplementary material 1. Database search strategy (October 21, 2020)

- #1 (TS=("Disabled Persons" OR "Disabl\*" OR "special-needs" OR "special needs" OR "handicap\*" OR "disabil\*" OR "special-care" OR "disabled Children" OR "Children with Disabilities" OR "Children with Disability" OR "Disabled Child" OR "Developmental Disabilities" OR "Intellectual Disability" OR "Intellectual Disabilities" OR "Intellectual Development Disorder" OR "Psychosocial Mental Retardation" OR "Psychosocial Mental Retardations" OR "Mental Deficiencies" OR "Mental Deficiency" OR "Mental Deficiencies" OR "Mental Deficiency" OR "Spastic Cerebral Palsy" OR "Hypotonic Cerebral Palsy" OR "Atonic Cerebral Palsy" OR "Dyskinetic Cerebral Palsy" OR "Athetoid Cerebral Palsy" OR "Monoplegic Cerebral Palsy" OR "Spastic Diplegia" OR "Little's Disease" OR "Little Disease" OR "Congenital Cerebral Palsy" OR "Rolandic Type Cerebral Palsy" OR "Quadriplegic Infantile Cerebral Palsy" OR "Mixed Cerebral Palsy" OR "Down syndrome" OR "Trisomy 21" OR "down syndrome\*" OR "Trisomy G" OR "47,XX,+21" OR "Down's Syndrome" OR "Downs Syndrome" OR "Attention Deficit Disorder with Hyperactivity" OR "Hyperkinetic Syndrome" OR "Attention Deficit-Hyperactivity Disorders" OR "attention deficit hyperactivity disorder" OR "ADHD" OR "ADDH" OR "Autistic Disorder" OR "Autism" OR "Kanner's Syndrome" OR "Kanner Syndrome" OR "Infantile Autism" OR "Autism Spectrum Disorder" OR "Autism Spectrum Disorders" OR "Asperger Syndrome" OR "Vision Disord\*" OR "visual impair\*" OR "Vision Disorders" OR "Hearing Disorders" OR "Vision Disorders" OR "Hearing Disord\*" OR "hearing impair\*" OR "developmental speech sound disorders" OR "developmental speech fluency disorder" OR "Developmental language disorder" OR "Language Development Disorders" OR "Learning Disabilities" OR "Learning Disabilities" OR "Developmental motor coordination disorder" OR "Motor Skills Disorders" OR "Stereotyped movement disorder" OR "Stereotypic Movement Disorder" OR "Stereotypic Movement Disorder" OR "developmental delay" OR "Neurodevelopmental Disorders" OR "Neurodevelopmental Disorders" OR "Cri-du-Chat Syndrome" OR "X-Linked Mental Retardations" OR "Prader-Willi Syndrome" OR "WAGR Syndrome" OR "Trisomy Syndrome" OR "Williams Syndrome" OR "Fetal Alcohol Spectrum Disorders" OR "Fetal Alcohol Syndrome" OR "Partial Fetal Alcohol Syndrome" OR "FASD" OR "FASDs" OR "Alcohol Related Birth Defects" OR "Fragile X Syndrome" OR "Fragile X Syndromes" OR "Marker X Syndrome" OR "Marker X Syndromes" OR "Martin-Bell Syndrome" OR "FRAXE Syndrome" OR "FRAXE Syndromes" OR "FRAXA Syndrome" OR "FRAXA Syndromes" OR "Kernicterus" OR "Bilirubin Encephalopathy" OR "Bilirubin Encephalopathies" OR "Myodystrophica" OR "Myodystrophy" OR "Tourette Syndrome" OR "Gilles de la Tourette Syndrome" OR "Tourette Disease" OR "Tourette Disorder" OR "Tourette Syndrome"))
- #2 WC=(Dentistry, Oral Surgery & Medicine)

Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.



Number of Papers (out of top 100 cited)

Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.



Number of Citations (out of top 100 cited)

Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

## **#1.** Down syndrome – A review of the literature. 1997.

Desai SS. Oral Surgery Oral Medicine Oral Pathology Oral Radiology and Endodontics. 84(3):279-285.

#2. Identification of a new variant of fimA gene of Porphyrmonas gingivalis and its distribution in adults and disabled populations with periodotitis. 2002.
 Nakagawa I, Amano A, Ohara-Nemoto Y, et al. Journal of Periodontal Research. 37(6):425-432.

**#3. Periodontal Disease in Downs Syndrome – A review. 1986.** Reulandbosma W, Vandijk J. Journal of Clinical Periodontology. 13(1):64-73.

**#4. New views on periodontal microbiota in special patient categories. 1991.** Slots J, Rams TE. Journal of Clinical Periodontology. 18(6):411-420. The 100 most-cited papers in dentistry for individuals with neurodevelopmental disorders:



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# Article Study Type



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# **Subject of Articles**



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# Ages Focus of Articles



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# **Population Focus of Articles**



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

# **Top 5 Journals Cited**



Kammer PV, Moro JS, et al. Spec Care Dentist. 2022. 42(4):369-375.

## **Older articles**

About 2/5 articles over 20 years old About 4/5 articles over 10 years old

#### Multiple sources

About 1/3 articles from 5 journals About 2/3 articles from other sources

## Study types

92% of articles observational or review

### Top areas studied

Epidemiology, Perio, Ortho

## **Populations studied**

About 50% Down syndrome, autism About 3/5 children and/or adolescents About 2/5 included adults

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.

# **#1. Searched YouTube Videos**

25 October 2022 Dental Fear, Dental Anxiety, Dental Phobia Top 100 viewed videos from each search term (300 total) Removed duplicates ( $300 \rightarrow 181$ ) Excluded: Games, cartoons, entertainment, meditation videos, non-English ( $181 \rightarrow 145$ )

# **#2.** Qualitative Analysis of Videos

**#3. Statistical Analysis of Videos** 

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.



Figure 2. Frequency count of videos uploaded on YouTube from 2007 to 2022.

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.



Figure 3. Source of videos on dental fear, dental anxiety, and dental phobia

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.



No Yes

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.

Groups of Video								
	With Misleading Information (%)	Without Misleading Information (%)	<i>p</i> -Value					
Source of video			0.158					
Lay public	23.8	76.2						
Professions a	9.0	91.0						
Others <sup>b</sup>	12.5	87.5						
Informant			0.684					
Health professions	12.5	87.5						
Non-health professions	10.2	89.8						
Number of views			0.004					
High view	19.4	80.6						
Low view <sup>c</sup>	4.1	95.9						

Table 11. Proportion (%) of videos with misleading information according to different video features.

<sup>a</sup> Videos created by hospital, dental clinic, or dental health professions; <sup>b</sup> Videos from television programs, television shows, network news, and educational settings; <sup>c</sup> Video with <5756 views = low view, by median split.

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.

Misinformation: People with dental fear or anxiety being exposed to videos of dental procedures would be beneficial.
 Truth: Not everyone would have their dental fear or anxiety alleviated after watching such videos. Some might become more anxious.

Misinformation: All psychological and non-pharmacological treatments were grouped as "cognitive-behavioral interventions" (CBI). Truth: CBI is a psychological intervention.

**Misinformation:** Dental fear and dental phobia are the same thing. **Truth:** They differ in severity and phobia leads to avoidance behavior.

Misinformation: "Specific dental phobia". Truth: Such a term has yet to be established in the literature.

Wong NSM, Yeung AWK, McGrath CP, Leung YY. Int J Environ Res Public Health. 2022 31;20(1):750.

# Misinformation: A video title said there were new drugs that could help dental anxiety. Truth: The drug actually replaced injection (helped with anesthesia) without targeting anxiety.

Misinformation: Dental phobia is actually a diagnosis in the Diagnostic and Statistical Manual (DSM).
Truth: Some people believed that dental phobia could be an example of specific phobia listed in DSM, but dental phobia itself is not listed in DSM.

Misinformation: Laughing gas is not sedation. Truth: Laughing gas (nitrous oxide) is used for inhalation sedation.

# Is Periodontitis Associated with Age-Related Cognitive Impairment? The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)



Age

**Figure 1.** The timeline continuum of periodontitis versus age-related cognitive impairment. The aging process unequally confounds the time available for periodontitis and age-related cognitive impairment initiation over a lifespan.

The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

## **Systematic Review**

5 Databases (PubMed, Embase, Scopus, Web of Science, Cochrane) 14 cohort studies, 1 cross-sectional study, 2 case-control studies Moderate quality of evidence

Risk of bias: Prevents conclusions being drawn about role of perio

# **Meta-analysis Perio-Cognitive association**

Cognitive impairment OR = 1.36 (95% CI: 1.03-1.79) Dementia OR = 1.39 (95% CI: 1.02-1.88) Alzheimer's disease OR = 1.03 (95% CI: 0.98-1.07)

The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)



Figure 2. Shared risk factors and predictors for periodontitis and age-related cognitive impairment.

The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)



**Figure 3.** Hypothetical mechanism of the neural pathological changes associated with chronic periodontal inflammation. The potential suggested primary role of periodontal pathogens, inflammatory mediators, local and systemic immune response, with a subsequent induction of amyloid beta formation and senile plaque accumulation in the central nervous system.

## The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

	Selection of Cohort				Comparability of Cohorts		Outcome			
Study	Representativeness of the Exposed Cohort	Selection of the Non-Exposed Cohort	Ascertainment of Exposure	Demonstration that Outcome of the Interest Was Not Present at Start of Study	Age and Addition	l Gender/ nal Factor	Assessment of Outcome	Long Enough Follow-Up for Outcome to Occur	Adequacy of Follow-Up of Cohorts	Total
Lee, 2020 [132]	*	*	*		*		*	*		6/9
Choi, 2019 [137]	*	*	*		*	*	*	*		7/9
Iwasaki, 2019 [138]		*	*	*	*	*	*	*		7/9
Chen, 2017 [133]	*	*	*		*		*	*		6/9
Lee, 2017 [134]		*	*		*		*	*		5/9
Tzeng, 2016 [136]		*	*		*		*	*		5/9
Iwasaki, 2016 [139]		*	*	*	*	*				5/9
Stewart, 2013 [142]		*	*	*	*	*				5/9
Naorungroj, 2015 [141]		*	*	*	*	*		*		6/9
Okamoto, 2015 [140]		*	*	*	*	*	*			6/9
Arrive, 2012 [144]			*		*	*		*	*	5/9
Kaye, 2010 [143]			*		*	*	*	*	*	6/9

Table 4. Quality of cohort studies assessed using the Newcastle–Ottawa scale.
## Is Periodontitis Associated with Age-Related Cognitive Impairment?

# The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

	Selection				Compa	arability	Outo	come	
Study	Representativeness of the Sample	Sample Size	Non- Respondents	Ascertainment of the Exposure (Absence or Exclusion)	The Subject Outcome Groups Based on the S Analysis. Conf are Con	s in Different s Are Comparable, Gudy Design or ounding Factors ntrolled.	Assessment of Outcome	Statistical Test	Total
Lee, 2017 [134]		*		*	*	*	*	*	6/8
Holmer, 2018 [131]				*	*	*	*	*	5/8

Table 5. Quality of cross-sectional studies assessed using the Newcastle–Ottawa scale.

Table 6. Quality of case-control studies assessed using the Newcastle-Ottawa scale.

	Selection of Case-Control			Comparability		Exposure			
Study	Is the Case Definition Adequate?	Representativeness of the Cases	Selection of Control	Definition of Control	Comparability of Cases and Controls on the Basis of the Design or Analysis	Ascertainment of Exposure	Same Method of Ascertainment for Cases and Controls	Non-Response Rate	Total
Gill-Montoya, 2015 [147]	*			*	*	*	*		5/9
Stein, 2007 [146]			*		* *	*	*		5/9

Is Periodontitis Associated with Age-Related Cognitive Impairment? The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

# **Comorbidities taken into account**

Blood sugar/diabetes: 14/17

Blood pressure/HTN: 13/17

Stroke/Cerebrovascular disease: 10/17

Cardiovascular disease: 9/17

Cholesterol/Hyperlipidemia: 8/17

Mental health/Depression: 6/17

Kidney disease/dialysis: 4/17

Traumatic brain injury: 3/17

Number of comorbidities: 1/17

Comorbidity index: 1/17

Cancer: 1/17

Respiratory/COPD: 1/17

Liver cirrhosis: 1/17

Hearing loss: 1/17

Is Periodontitis Associated with Age-Related Cognitive Impairment? The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

# **Confounders/covariates considered**

Age: 17/17

Sex: 16/17

Smoking: 11/17

Alcohol: 8/17

Oral hygiene: 3/17

Dental care: 2/17

Is Periodontitis Associated with Age-Related Cognitive Impairment? The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

# **Confounders/covariates considered**

Education: 11/17

BMI: 9/17

Income: 7/17

Medications: 4/17

Physical activity: 3/17

Is Periodontitis Associated with Age-Related Cognitive Impairment? The Systematic Review, Confounders Assessment and Meta-Analysis of Clinical Studies

Arkadiusz Dziedzic. Int J Mol Sci. 2022. 23(23)

# **Discussion: Main Points**

Causality cannot be inferred due to moderate/low quality of the study designs

Inadequate inclusion of confounders

**Residual confounding** 

"None of the reviewed studies met the criteria for longitudinal, large sample projects, with sufficient control of cofounders or standardized outcome measures."

"...the hypothesis that periodontitis and ACI are linked cannot be ruled out and a bidirectional relationship is possible."

Effect of silver diamine fluoride on hyperplastic gingivitis in an adult with intellectual disability: A case report

Lim, GXD and Yang, Jingrong. Spec Care Dentist. 2022, 42(1):73-79.

# **Case Study**

41 year old male Intellectual disability Hyperlipidemia (simvastatin) Allergy: Prawn/squid

> Brushes own teeth Fair/poor oral hygiene

Demineralization and hypersensitive teeth

Gingival inflammation not fully resolving after multiple debridement treatments





Effect of silver diamine fluoride on hyperplastic gingivitis in an adult with intellectual disability: A case report

Lim, GXD and Yang, Jingrong. Spec Care Dentist. 2022, 42(1):73-79.

# SDF

Approved as desensitizing agent in 2016 (US) Also used off-label as caries preventing/arresting agent

Cariostatic action Biofilm disruption Altering collagen within dentinal tubules Remineralization and stabilization of mineral matrix Effect of silver diamine fluoride on hyperplastic gingivitis in an adult with intellectual disability: A case report

Lim, GXD and Yang, Jingrong. Spec Care Dentist. 2022, 42(1):73-79.

## **References from study on SDF + Perio pathogens/gingivitis**

Ho Y. An in vitro pilot study on the effects of Silver diamine fluoride on periodontal pathogens and three-dimensional scaffolds of fibroblasts and epithelium. **Thesis** for Faculty of the Tufts University School of Dental Medicine, ProQuest Dissertations Publishing; c2020. https://search.proquest.com/openview/dc5f017b3cbef6cc9ab91169ecb445ce/1?pqorigsite=gschol ar&cbl=51922&diss=y. Accessed March 1,2021.

Ramirez-Martinez GJ. Antimicrobial effects in vitro of silver diamine fluoride against selected human red and orange complex periodontal pathogens. **Thesis** for Temple University Graduate Board, Temple University Libraries. c2019. https://doi.org/10.34944/dspace/3425. Accessed March 1, 2021.

Alshehri W. Effect of Silver diamine fluoride on the treatment of gingivitis in geriatric patients. **Doctoral dissertation** for Texas: A&M University, OAKTrust; c2020. https://hdl.handle.net/1969.1/189553. Accessed March 1, 2021.

# Special Care Advocates in Dentistry Literature Review

Kim Espinoza and Scott Howell

# **Topics**

- 1. Head and neck cancers
- 2. Cleft palate
- 3. Mental health
- 4. Substance use
- 5. Other topics
- 6. Antibiotic stewardship

# Head and neck cancers

Purpose: Determine dental defects based on treatments for childhood cancer

Methods: Cross-sectional study of children at Hadassah Hebrew-University Medical Center in Jerusalem from 2017 – 2019.

Overall findings: 121 subjects, radiotherapy, particularly to the head/neck region, at younger ages resulted in more anomalies The prevalence of dental developmental anomalies among childhood cancer survivors according to types of anticancer treatment. Halperson E, Matalon V, Goldstein G, Saieg Spilberg S, Herzog K, Fux-Noy A, Shmueli A, Ram D, Moskovitz M. Sci Rep. 2022 Mar 16;12(1):4485. doi: 10.1038/s41598-022-08266-1.

Variable	# of patients (%)
Gender	N=121
Male	76 (63%)
Female	45 (37%)
Diagnosis category (1)	N=121
Acute lymphocytic leukemia	27 (22%)
Acute myelocytic leukemia	10 (8%)
Non-Hodgkin lymphoma	9 (7%)
Hodgkin lymphoma	7 (6%)
Sarcoma	17 (14%)
Neuroblastoma	14 (12%)
Other solid tumors	4 (3%)
Hematological condition	31 (26%)
Other	2 (2%)
Diagnosis category (2)	N=119
Leukemia and lymphoma	53 (45%)
Solid tumor	35 (29%)
Hematological	31 (26%)
Treatment	N=121
Chemotherapy only	83 (69%)
Any radiation (chemotherapy and radiation therapy or radiation therapy only)	38 (31%)
Radiotherapy	N=121
None	83 (69%)
Total body irradiation	14 (12%)
Head/neck	15 (13%)
Other	9 (7%)
Surgical treatment	N=121
No	102 (84%)
Yes	19 (16%)
Bone marrow transplantation	N=121
No	85 (70%)
Yes	36 (30%)

Primarily male Largely leukemia and lymphoma Chemotherapy the more common treatment Fewer surgeries and bone marrow transplants

Figure 1. Long term dental effects. (A) Hypoplasia in the front upper and lower teeth of a girl aged 9 years,

treated for ALL at age 3.5 years. (B) Microdontia showing the second upper right premolar in a girl age

12 years, treated for neuroblastoma at age 4 years. (C) A panoramic radiograph of a 12-year-old boy diagnosed

with Burkitt's lymphoma at age 4 years, revealing: C1. Altered root development at the first lower right

molar, C2. Hypodontia of the second lower left molar. (D) Radiation caries in a 21-year-old boy treated for

neuroectodermal tumor at age 14 years.



Type of malformation	#children N=121	#teeth N=3388	
None	65 (54%)	3079 (91%)	
Hypocalcification or hypoplasia	21 (17%)	62	
Microdontia	21 (17%)	57	
Root changes	26 (21%)	160	
Hypodontia	13 (11%)	30	
Any malformation	56 (46%)	309 (9%)	

		Chemotherapy only $N=83$	Any radiation $N=38$	BMT $N=36$	Head/neck radiation $N=15$
Radiation	Categorical variables	N (%)	N (%)	N (%)	N (%)
resulted in the	Any malformed teeth	36 (43%)	20 (53%)	15 (42%)	9 (60%)
highest	The number of malformed teeth				
number of	0	47 (57%)	18 (47%)	21 (58%)	6 (40%)
mairormations	1	7 (8%)	5 (13%)	4 (11%)	2 (13%)
	2	7 (8%)	3 (8%)	0	2 (13%)
	3	8 (10%)	2 (5%)	5 (14%)	1 (7%)
	4	8 (10%)	0	3 (8%)	0
In most	>5	6 (7%)	10 (26%)	3 (8%)	4 (27%)
circumstances,	The type of malformation (>1 toot	h with malformation)			
the chance for	Hypocalcification or hypoplasia	11 (13%)	10 (26%)	5 (14%)	5 (33%)
malformation	Microdontia	16 (19%)	5 (13%)	7 (19%)	3 (20%)
appears to be	Root changes	15 (18%)	11 (29%)	5 (14%)	4 (27%)
lower than	Hypodontia	9 (11%)	4 (11%)	4 (11%)	2 (13%)
developing a	DMFT, mean (SD)	5.93 (5.73)	8.37 (6.88)	6.67 (6.85)	7.93 (5.46)
malformation					

**Table 3.** Dental developmental anomalies according to anticancer treatment modalities. BMT, bone mineral transplantation; DMFT, decayed, missing, and filled teeth; SD, standard deviation.

Age of treatment appears to play a role in the development of a malformation

The number of children affected isn't necessarily impacted but the number of teeth impacted and when treatment occurred is statistically significant

Type of malformation	$\leq$ 6 years $N = 55$	$>6 \le 12$ years $N=43$	P-value *Chi-squared test utilized
Total number of children with any malformation	31 (56%)	19 (44%)	0.231
Hypocalcification or hypoplasia	8 (15%)	10 (23%)	0.269
Microdontia	18 (33%)	3 (7%)	0.002*
Root changes	15 (27%)	9 (21%)	0.469
Hypodontia	11 (20%)	1 (2%)	0.007*
Total number of malformed teeth	4.15 (6.85)	1.67 (3.82)	0.013*
DMFT	6.07 (6.49)	6.02 (4.70)	0.483

**Table 4.** Dental anomalies in children who received anticancer therapies, according to the age of initiation of treatment. Note that this analysis included only children aged 12 years and younger at the initiation of treatment. DMFT, decayed, missing, and filled teeth. The data are presented as N (%) or as mean (standard deviation).

Purpose: updated meta-analysis to evaluate using probiotics to prevent or treat cancer therapy related oral mucositis

Methods:

- Articles from 2007-2022
- Inclusion criteria
  - RCT
  - full text available
  - patients received chemo, radio, or any therapy
  - description of probiotics
  - description of mucositis severity

Results: Probiotics show some promise in preventing/treating caner therapy related oral mucositis

Preventive Effect of Probiotics on Oral Mucositis Induced by Cancer Treatment: A Systematic Review and Meta-Analysis. Liu YC, Wu CR, Huang TW. Int J Mol Sci. 2022 Oct 31;23(21):13268.



Identification

Screening

Eligibility

Included



Started with 384 studies Full text review of 38 7 studies used for meta-analysis

Author [Year]	Bias Caused by Adequacy of Randomization	Bias Caused by Deviations from Intended Interventions	Bias Caused by Missing Data of Dropouts	Bias in Measurement of the Outcomes	Bias in Selection of the Reported Results	Overall Risk of Bias
Jiang 2019 [17]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Limaye 2013 [22]	Some concerns 1	Low risk	High risk <sup>2</sup>	Some concerns 3	Low risk	High risk
Mirza 2022 [23]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Österlund 2007 [24]	High risk <sup>4</sup>	Low risk	Low risk	Low risk	Low risk	High risk
Sanctis 2019 [21]	High risk 5	High risk <sup>6</sup>	Low risk	Low risk	Low risk	High risk
Sharma 2012 [25]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk
Topuz 2008 [26]	Some concerns 7	Low risk	Low risk	Low risk	Low risk	Some concerns
Xia 2021 [27]	Low risk	Low risk	Low risk	Low risk	Low risk	Low risk

Table 2. Assessment of Methodological Quality of Included Trials (RCT evaluated by ROB 2.0).

<sup>1</sup>: no information and detail on the method of randomization; <sup>2</sup>: high percentage of missing data (24%); <sup>3</sup>: no information on the blindness of the outcome assessor; <sup>4</sup>: open-label design; <sup>5</sup>: open-label design; <sup>6</sup>: high percentage of interruption of probiotic intake (34.3%); <sup>7</sup>: no information and detail for the way of randomization.

# 4 studies with low risk

3 studies with high risk

1 study with some concersn

## Probiotics show reduced risk of oral mucositis

(a)



Figure 3. Forest plot of comparison: probiotics or control group. Outcome: (a) incidence of severe oral mucositis; (b) incidence of severe oral mucositis in patients receiving chemo-radiotherapy; (c) incidence of severe oral mucositis in patients receiving probiotics containing lactobacillus spp. only.

(b)



# **Cleft Palate**

Purpose: Evaluate outcomes for those born with a cleft lip or palate and receiving speechlanguage therapy

## Methods: Inclusion criteria

- Evaluate conventional SLT intervention
- Measure outcomes for speech production, language ability, intelligibility, or patient reported outcomes
- English language

Box 1. The difference between statistically significant and clinically relevant.

Participant	PCC before SLT	PCC after SLT	Difference
A	20%	26%	6%-points
В	25%	29%	4%-points
С	30%	35%	5%-points
D	35%	41%	6%-points
E	40%	45%	5%-points
M (SD)	30% (8%-points)	35% (8%-points)	5%-points (0.8%-points

In the table above, we have illustrated five individuals' pre- and post-intervention speech production measured as percentage of consonants correct [PCC] in a picture-naming task. The pre-post difference is consistent between individuals and, thus, statistically significant ( $t_4 = 13.9$ , p < .001). However, none of the individuals improved to a clinically relevant degree.

In the table below, we have illustrated a similar set of data. Here, the pre-post difference is inconsistent between individuals and, thus, not statistically significant ( $t_4 = 1.6$ , p = .18). Some individuals have, however, improved to a clinically relevant degree; an increase from 25% or 35% to 95% should be important in everyday settings.

Participant	PCC before SLT	PCC after SLT	Difference
A	20%	20%	0%-points
B	25%	95%	70%-points
C	30%	30%	0%-points
D	35%	95%	60%-points
E	40%	40%	0%-points
M (SD)	30% (8%-points)	56% (36%-points)	26%-points (36%-points)

# Statistical

vs Clinical Significance

On the Benefits of Speech-Language Therapy for Individuals Born With Cleft Palate: A Systematic Review and Meta-Analysis of Individual Participant Data. Sand A(1), Hagberg E(1)(2), Lohmander A(1)(2). J Speech Lang Hear Res. 2022 Feb 9;65(2):555-573. doi: 10.1044/2021\_JSLHR-21-00367. Epub 2022 Jan 6.



Figure 2. Overview of the meta-analysis on proportion of individuals who improved to a clinically relevant degree during intervention (number of improved participants divided by sample size). In the forest plot, the point estimate of each study is illustrated as gray boxes, and the lines illustrate 95% confidence intervals (CIs; Clopper–Pearson "exact method"). The sizes of the gray boxes are relative to the (random-effects) weights of the studies (their relative "precision" or inverse variance, compared to full data set). The studies are roughly grouped and delimited by horizontal lines based on study design and intervention implementation. On the bottom, the meta-analytical CI is illustrated as a diamond, and the prediction interval is illustrated as a thick line.



Clinically significant outcomes

Wide variety of positive outcomes.

As little as 20% of participants may improve to as many as 100% participants Figure 3, Illustration of the mixed-effects logistic regression model in which age at intervention was related to the probability that an individual improved to a clinically relevant degree during the intervention. The logistic regression function has been back-transformed to the probability scale (y-axis). The solid black line illustrates the logistic function over the whole age range using the average of the random intercepts. The gray lines illustrate each included study. Note that the studies differ in intercepts (studies are random effects) and age range of studied individuals, but not the coefficient (age was fitted as a fixed effect).



	Total	Imp	proved	Peer level		
Type of cleft	Na	n (%)	Predicted <sup>b</sup>	n (%)	Predicted <sup>b</sup>	
Unilateral CLP Bilateral CLP Cleft palate	240 28 35	193 (80) 18 (64) 25 (71)	79% 68% 76%	52 (22) 8 (29) 14 (40)	17% 16% 36%	

#### Note. CLP = cleft lip and/or palate.

<sup>a</sup>One individual with submucous cleft palate and one individual with soft palate cleft were coded as having a cleft palate; one individual with a cleft lip was excluded. <sup>b</sup>The probabilities reported under "Predicted" are the model predictions (back-transformed to the probability scale) that take between-studies variability into account

> Type of cleft may impact how well an individual is likely to improve, with

Younger participants have a higher



Figure 4. Overview of the meta-analysis on proportion of individuals who had speech production on a level with peers after speechlanguage therapy (SLT). In the forest plot, the point estimate of each study is illustrated as gray boxes, and the lines illustrate 95% confidence intervals (CIs; Clopper–Pearson "exact method"). The sizes of the gray boxes are relative to the (random effects) weights of the studies (their relative "precision" or inverse variance compared to full data set). The studies are roughly grouped and delimited by horizontal lines based on study design and intervention implementation. On the bottom, the meta-analytical CI is illustrated as a diamond, and the prediction interval is illustrated as a thick line.

Study Luyten et al., 2016 Alighieri et al., 2019 Lindeborg et al., 2020 Scherer et al., 2008 Dobbelsteyn et al., 2014 Sritacha et al., 2016 Pumnum et al., 2015 Prathanee et al., 2015 Prathanee et al., 2014 Prathanee, 2011 Makarabhirom et al., 2015 Hanchanlert et al., 2015 Sweeney et al., 2020 Roxburgh et al., 2016 Derakhshandeh et al., 2016 Pamplona & Ysunza, 2018 Pamplona et al., 2017	Peer Level 0 0 	N 5 2 38 7 6 4 12 16 9 16 6 29 2 5 5 32 41		Proportion 0.00 0.079 0.60 0.00 0.50 0.25 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.50 0.25 0.50 0.50 0.50 0.25 0.50 0.50 0.50 0.50 0.25 0.50	95% Cl [0.00, 0.52] [0.017, 0.21] [0.26, 0.88] [0.00, 0.41] [0.12, 0.88] [0.0063, 0.81] [0.21, 0.79] [0.25, 0.75] [0.25, 0.75] [0.25, 0.75] [0.22, 0.96] [0.10, 0.44] [0.0051, 0.72] [0.0079, 0.16] [0.00, 0.086]	Weight 4.1% 2.6% 7.0% 5.3% 4.7% 4.5% 3.8% 5.6% 6.0% 5.2% 6.0% 4.5% 6.0% 4.5% 6.0% 4.5% 6.0% 4.5% 7.0%
Pamplona et al., 2017 Pamplona et al., 2014 Van Demark & Hardin, 1986 Random-effects model Heterogeneity, <i>I</i> <sup>2</sup> = 78%, <i>Q</i> =	0 26 2 81.50	41 90 13 343		0.00 0.29 0.15 <b>0.21</b> Prediction	[0.00, 0.086] [0.20, 0.39] [0.019, 0.45] <b>[0.10, 0.34]</b> interval [0.00, 0.	7.0% 7.4% 5.8% <b>100%</b> 71]
			Proportion peer-level speech			

Low likelihood (21%) that those who undergo speech therapy will reach the level of speech as their peers

# **Mental Health**

 Prevalence of dental disorders among people with mental illness: An umbrella review. Choi J, Price J, Ryder S, Siskind D, Solmi M, Kisely S. Aust N Z J Psychiatry. 2022 Aug;56(8):949-963. doi: 10.1177/00048674211042239. Epub 2021 Aug 30.

 A Systematic Review and Meta-Analysis of the Association Between Periodontal Disease and Severe Mental Illness.
Cai V(1), Peng Ng C, Zhao J, Siskind D, Kisely S. Psychosom Med.
2022 Sep 1;84(7):836-847. doi: 10.1097/PSY.000000000001102.
Epub 2022 Jun 28.

3. Risk factors and oral health-related quality of life: A case-control comparison between patients after a first-episode psychosis and people from general population.

Kuipers S, Castelein S, Barf H, Kronenberg L, Boonstra N. J Psychiatr Ment Health Nurs. 2022 Jun;29(3):430-441. doi: 10.1111/jpm.12820. Epub 2022 Feb 2.

#### Figure 1. PRISMA diagram.



1. Umbrella Review, dental disorders and mental illness

### Studies included: 11

### Inclusion criteria:

- Metal-analyses
- Oral health of adults with mental illness, including substance use disorders

#### Table 5. Summary.

	DMFT/caries	Periodontal disease	Edentulism	Dental erosion
SMI	Generally suggestive to highly suggestive	N/A	Suggestive	N/A
Substance use	Non-significant to highly suggestive	Non-significant to highly suggestive	N/A	Weak
Common mental disorders (depression and anxiety disorders)	Non-significant to weak	Non-significant to weak	Weak to suggestive	N/A
Eating disorders	Weak	N/A	N/A	Weak to suggestive

DMFT: decayed, missing and filled teeth; SMI: severe mental illness.

- Convincing (class I) when the number of cases>1000, p<0.00001, I2<50% and there are no small study effects as detected in tests for publication bias.
- Highly suggestive (class II) when the number of cases>1000, p<0.00001, the largest study in the meta-analysis has a statistically significant effect and class I criteria are not met.
- Suggestive (class III) when the number of cases>1000, p<0.001 and class I and II criteria not met.
  - Weak (class IV) when p<0.05 and class I-III criteria not met.

Evidence for mental illness as a predictor for oral health conditions varies



FIGURE 1. Articles yielded from search strategy. CNKI = China National Knowledge Infrastructure; CQVIP = Chongqing VIP.

Studies included: 17

English and Chinese databases searched

Inclusion criteria:

 Compare sample group with internal or external control group 2. Association between periodontal disease and severe mental illness

JBI Critical Appraisal Checklist	No. Studies		
	Yes	No	Unclear
Were the criteria for inclusion in the sample clearly defined?	8	9	
Were the study subjects and the setting described in detail?	13	4	
Was the exposure measured in a valid and reliable way?	4	1	12
Were objective, standard criteria used for measurement of the condition?	12		5
Were confounding factors identified?	8	9	
Were strategies to deal with confounding factors stated?	7	10	
Were the outcomes measured in a valid and reliable way?	6		11
Was appropriate statistical analysis used?	16	1	

JBI = Joanna Briggs Institute.

Mixed level of quality throughout the studies



**FIGURE 2.** Presence of periodontal disease. CI = confidence interval.

Those with SMI had 4.28 times the odds of having periodontal disease

Quite a bit of variability between the studies


**FIGURE 3.** Scores of 3 and 4 on the community periodontal index of treatment needs. CI = confidence interval; CPI = Community Periodontal Index; MH = Mantel-Haenszel.

#### 3. Case-Control measuring QOL after first-episode psychosis

#### Is the exposure (first-episode psychosis) associated with lower QOL?

	Case group (n = 81)		Contro (n = 16	Control group (n = 166)		
Risk factors	n	%	n	%	χ <sup>2</sup>	р
Risk factors in general						
Smoking	43	53.1	40	24.1	20.51	.00
Illicit drugs	9	11.1	22	13.3	0.23	.69
Alcohol	52	64.2	127	76.5	4.13	.05
Sugary food/drinks	64	79.0	119	71.7	1.52	.28
Antipsychotics and other common medication that is related to oral health	66	81.5	N/A	N/A	N/A	
Risk factors dental behaviour						
Low frequency brushing	40	49.4	43	25.9	13.45	.00*
Short duration brushing	33	40.7	46	27.7	4.25	.04
Few use of dental aid	31	38.3	60	36.1	0.11	.78
Risk factors preventive care						
Low number of dental visits	36	44.4	73	44.0	0.00	1.00
Low number of dental hygienist visits	67	82.7	143	86.1	0.50	.57
Financial risk factors						
Not enough finances	26	32.1	8	4.8	34.13	.00*
No insurance oral care	27	33.3	58	34.9	0.06	.89

Note: <sup>\*</sup>Statistically significant p-values (p < .05) and corrected for multiple testing using Bonferroni correction (Bonferroni adjustment for alpha=<.004)

### Psychosis possible risk factor for increase smoking, low frequency brushing, and not enough finances

Dimension	Case (n =	Case (n = 81)		= 166)		
(N items, min-max score)	Median	Range	Median	Range	Mann Whitney U	p
Functional limitation (9 items 0-36)	1	9	0	10	5428.5	.00
Physical pain (9 items, 0-36)	1	18	1	14	6418.0	.54
Psychological discomfort (5 items 0-20)	0	15	0	10	4635.5	.00
Physical disability (9 items 0-36)	0	12	0	12	5622.5	.00°
Psychological disability (6 items 0-24)	у О	10	0	12	6163.0	.05
Social disability (5 items 0–20)	0	2	0	3	6635.5	.63
Handicap (6 items 0-24)	0	9	0	9	6297.5	.09
OHIP total score (0–196)	5	60	1	50	4659.0	.00

Note: Statistically significant p-values (p < .05) are corrected for multiple testing using Bonferroni correction (Bonferroni adjustment for alpha =<.006)

<sup>a</sup>As measured on the OHIP-49 scale 0-196. Higher scores mean lower OHRQoL.

Psychosis possible risk factor for increased oral health impact score/lower quality of life

# Takeaways from mental health and oral health

- Evidence demonstrates associations between mental health and oral health
- Unclear to what extent mental health impacts oral health
- Unclear how well we can predict oral health outcomes based on mental health conditions
- Serious Mental Illness (mental illnesses that result in serious functional impairment) appear more likely to predict/impact oral health conditions

### **Other Topics**

Association between primary headaches and temporomandibular disorders Jéssica Conti Réus DDS, MSc, Helena Polmann DDS, MSc, Beatriz Dulcineia Mendes Souza DDS, MSc, PhD, Carlos Flores-Mir DDS, MSc, PhD, Daniela Aparecida Godói Gonçalves DDS, MSc, PhD, Luiz Paulo de Queiroz DMD, MSc, PhD, Jeffrey Okeson DMD, MSc, PhD and Graziela De Luca Canto DDS, MSc, PhD The Journal of the American Dental Association (JADA), 2022-02-01, Volume 153, Issue 2, Pages 120-131.e6

Purpose: Assess the association between primary headaches and temporal mandibular disorders in adults

Methods: Systematic review, 9 qualitative studies and 7 quantitative studies Inclusion criteria:

- 18 years or older
- Primary headaches (migraines, chronic migraines, tension-type headaches, cluster headache, trigeminal autonomic cephalalgias)
- Temporal mandibular disorder
- Assessment of PHs and TMDs
- Observational studies



#### Identified 4,594 studies

#### 9 qualitative studies

#### 7 quantitative studies



Figure 2Meta-analysis of pain-related temporomandibular disorders (TMD) and primary headaches (analytical cross-sectional studies). M-H: Mantel-Haenszel. Analytical cross-sectional studies

Analytical Cross-Sectional Studies: Hypothesize the exposures relationship to the outcome



Figure 3Meta-analysis of pain-related temporomandibular disorders (TMD) and primary headaches (descriptive cross-sectional studies). M-H: Mantel-Haenszel. Descriptive cross-sectional studies

Descriptive Cross-Sectional Studies: Characterize the exposures relationship to the outcome

### Antibiotic stewardship

Quantifying the risk of prosthetic joint infections after invasive dental procedures and the effect of antibiotic prophylaxis. Thornhill MH, Gibson TB, Pack C, Rosario BL, Bloemers S, Lockhart PB, Springer B, Baddour LM. J Am Dent Assoc. 2023 Jan;154(1):43-52.e12. doi: 10.1016/j.adaj.2022.10.001. Epub 2022 Dec 2

Purpose: Determine if there is a positive association between invasive dental procedures (IDP) and late periprosthetic joint infections (LPJI)

Methods: Data taken from the Commercial, Medicare Supplemental, Prescription Benefits, and Dental IBM Market-Scan databases, and data obtained from Medicaid database, data from October 2009 to December 2019 Table 2. Case-crossover analysis comparing the incidence of different dental procedures (with and without AP\* cover) in the 3-month case period (months 1-3 before LPJI<sup>+</sup> admission) and the preceding 12-month control period (months 4-15 before LPJI admission).

DENTAL PROCEDURES	ALL LPJI PATIENTS			COMMERCIAL OR MEDICARE SUPPLEMENTAL LPJI PATIENTS			MEDICAID LPJI PATIENTS		
	Case Period, Procedures/ mo	Control Period, Procedures/ mo	Odds Ratio (95% Cl) Unadjusted, Adjusted <sup>‡</sup> <i>P</i> Values	Case Period, Procedures/ mo	Control Period, Procedures/ mo	Odds Ratio (95% Cl) Unadjusted, Adjusted <sup>‡</sup> <i>P</i> Values	Case Period, Procedures/ mo	Control Period, Procedures/ mo	Odds Ratio (95% Cl) Unadjusted, Adjusted <sup>‡</sup> <i>P</i> Values
Invasive									
All	110.3	124.1	0.890 (0.790 to 1.002) .054, .486	89.3	99.3	0.896 (0.783 to 1.025) .110, .990	21.0	24.8	0.868 (0.674 to 1.117) .271, 1
No AP cover	83.7	102.9	0.814 (0.711 to 0.932) .003, .027	67.7	81.2	0.829 (0.711 to 0.966) .016, .144	16.7	22.5	0.766 (0.576 to 1.020) .068, .612
AP cover	26.3	21.1	1.252 (0979 to 1.601) .073, .657	21.7	18.1	1.197 (0.908 to 1.578) .203, 1	4.0	2.2	1.665 (0.924 to 3.000) .089, .801
Intermediate									
All	41.0	56.2	0.750 (0.623 to 0.902) .002, .018	27.7	39	0.719 (0.572 to 0.905) .005, .045	13.3	17.2	0.812 (0.596 to 1.107) .188, 1
No AP cover	31.0	43.8	0.728 (0.589 to 0.901) .003, .027	21.3	30.3	0.716 (0.552 to 0.928) .012, .108	11.3	14.9	0.798 (0.570 to 1.116) .188, 1
AP cover	10.0	12.3	0.829 (0.572 to 1.203) .323, 1	6.3	8.7	0.737 (0.455 to 1.195) .216, 1	2.0	2.2	0.906 (0.403 to 2.036) .812, 1
Noninvasive									
All	114.0	137.8	0.842 (0.754 to 0.941) .002, .018	85.0	98.2	0.876 (0.770 to 0.997) .046, .414	29.0	39.6	0.760 (0.612 to 0.943) .013, .117
No AP cover	92.3	113.7	0.829 (0.733 to 0.938) .003, .027	67.7	79.2	0.867 (0.750 to 1.002) .054, .486	25.3	36.2	0.732 (0.581 to 0.921) .008, .072
AP cover	21.7	24.2	0.908 (0.706 to 1.170) .456, 1	17.3	19.1	0.918 (0.691 to 1.220) .555, 1	3.7	3.4	1.063 (0.572 to 1.976) .846, 1

Those with no AP cover, odds are they won't get an LPJI if they have invasive (surgical) dental procedure

Those with no AP cover, odds are they won't get an LPJI if they have intermediate (restorative with gingival manipulation) dental procedure

Those with no AP cover, odds are they won't get an LPJI if they have intermediate (restorative with gingival manipulation) dental procedure



**Figure.** Incidence of invasive, intermediate, and noninvasive dental procedures (DPs) during the 15 months before late periprosthetic joint infection (LPJI) hospital admission. Top row: Plots for all DPs. Middle row: plots for DPs not covered by antibiotic prophylaxis (AP). Bottom row: plots for DPs covered by AP. LPJI admission is denoted by the vertical blue arrow. The incidence of invasive (blue), intermediate (light green), and noninvasive (green) DPs are plotted during the 15 months before LPJI admission, divided into a 3-month case period immediately before admission and a 12-month control period before that. Dotted lines show the trend of DP incidence for the control period extended into the case period for each DP type.

#### **Care Decision Tree**

When is it appropriate to prescribe prophylactic antibiotics for patients with orthopaedic implants?



https://www.aaos.org/globa lassets/quality-and-practiceresources/dental/dentalprophylaxis-auc-decisiontree-1.pdf

### **Appropriate Use Criteria**



## Thank you!

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