



10-2017

## Insight - October 2017

Dugoni School of Dentistry

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# insight

## News and updates about research and scholarship at University of the Pacific, Arthur A. Dugoni School of Dentistry

Welcome to the first issue of *Insight*, a new quarterly newsletter celebrating some of the many accomplishments from our community of researchers. Whether you are involved in clinical research, biomedical research, the scholarship of teaching and learning, improvement of the health care system, or professional partnerships that advance the field, we aim to spotlight the work of people at the Dugoni School.

### RESEARCH IN THE SPOTLIGHT

#### **Dental Caries: An Update on Dental Trends and Therapy**

*Advances in Pediatrics* includes a review by Dugoni School faculty of caries risk assessment in children, and the role of oral health professionals and other medical professionals.

#### **Source**

[Dental Caries: An Update on Dental Trends and Therapy](#), *Advances in Pediatrics*, Volume 64, Issue 1, August 2017, Pages 307-330

#### **Authors**

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#### **What is it?**

A review of caries risk assessment in children, and the role of oral health professionals and other medical professionals in helping treat patients and providing preventative care.

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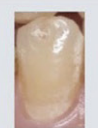









## Research and Scholarship

### What problem does it aim to solve?

There has been a significant increase in the prevalence of dental caries globally, including among children. Domestically, the rate of caries prevalence is stable or decreasing, but there are stark differences along ethnic and socioeconomic lines, and significant access-to-care issues.

### How does it work?

The article reviews the factors behind dental caries and supports the practice of caries management by risk assessment, followed by proactive use of strategies involving oral products and behavioral change. The article also reviews various strategies for arresting and reversing damage to teeth. Brushing and flossing are not sufficient in and of themselves. Behavioral modification techniques are important too. Non-dental medical providers also need to be able to assess oral health, and also use prevention tools like fluoride varnish. Dental decay on teeth with a healthy nerve may be treated in a noninvasive manner using silver diamine fluoride. Glass ionomer cement (GIC) is another good option because it is compatible with a moist surface, doesn't require light curing and supports remineralization.

American Dental Association Caries Classification System.							
	AMERICAN DENTAL ASSOCIATION CARIES CLASSIFICATION SYSTEM						
	Sound	Initial		Moderate	Advanced		
Clinical Presentation	No clinically detectable lesion. Dental hard tissue appears normal in color, translucency, and gloss.	Earliest clinically detectable lesion compatible with mild demineralization. Lesion limited to enamel or to shallow demineralization of cementum/dentin. Mildest forms are detectable only after drying. When established and active, lesions may be white or brown and enamel has lost its normal gloss.		Visible signs of enamel breakdown or signs the dentin is moderately demineralized.	Enamel is fully cavitated and dentin is exposed. Dentin lesion is deeply/severely demineralized.		
Other Labels	No surface change or adequately restored	Visually noncavitated		Established, early cavitated, shallow cavitation, microcavitation	Spread/disseminated, late cavitated, deep cavitation		
Infected Dentin	None	Unlikely		Possible	Present		
Appearance of Occlusal Surfaces (Pit and Fissure)*†	ICDAS 0 	ICDAS 1 	ICDAS 2 	ICDAS 3 	ICDAS 4 	ICDAS 5 	ICDAS 6 
Accessible Smooth Surfaces, Including Cervical and Root‡							
Radiographic Presentation of the Approximal Surface§	 E0 <sup>¶</sup> or R0 <sup>¶</sup> No radiolucency	 E1 <sup>¶</sup> or RA1 <sup>¶</sup>	 E2 <sup>¶</sup> or RA2 <sup>¶</sup>	 D1 <sup>¶</sup> or RA3 <sup>¶</sup>	 D2 <sup>¶</sup> or RB4 <sup>¶</sup> Radiolucency extends into the middle one-third of the dentin	 D3 <sup>¶</sup> or RC5 <sup>¶</sup> Radiolucency extends into the inner one-third of the dentin	

\* Photographs of extracted teeth illustrate examples of pit-and-fissure caries.

† The ICDAS notation system links the clinical visual appearance of occlusal caries lesions with the histologically determined degree of dentinal penetration using the evidence collated and published by the ICDAS Foundation over the last decade; ICDAS also has a menu of options, including 3 levels of caries lesion classification, radiographic scoring and an integrated, risk-based caries management system ICCMS. (Pitts NB, Ekstrand KR. International Caries Detection and Assessment System [ICDAS] and its International Caries Classification and Management System [ICCMS]: Methods for staging of the caries process and enabling dentists to manage caries. *Community Dent Oral Epidemiol* 2013;41[1]:e41-e52. Pitts NB, Ismail AI, Martignon S, Ekstrand K, Douglas GAV, Longbottom C. ICCMS Guide for Practitioners and Educators. Available at: [https://www.icdas.org/uploads/ICCMS-Guide\\_Full\\_Guide\\_US.pdf](https://www.icdas.org/uploads/ICCMS-Guide_Full_Guide_US.pdf). Accessed April 13, 2015.)

‡ "Cervical and root" includes any smooth surface lesion above or below the anatomical crown that is accessible through direct visual/tactile examination.

§ Simulated radiographic images.<sup>33</sup>

¶ E0-E2, D1-D3 notation system.<sup>33</sup>

# R0, RA1-RA3, RB4, and RC5-RC6 ICCMS radiographic scoring system (RC6 = into pulp). (Pitts NB, Ismail AI, Martignon S, Ekstrand K, Douglas GAV, Longbottom C. ICCMS Guide for Practitioners and Educators. Available at: [https://www.icdas.org/uploads/ICCMS-Guide\\_Full\\_Guide\\_US.pdf](https://www.icdas.org/uploads/ICCMS-Guide_Full_Guide_US.pdf). Accessed April 13, 2015.)



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## Research and Scholarship

The article also discusses issues around providing dental care to patients with special needs, and the role of hospital dentistry in treating such patients. The article concludes by looking at the problems caused by lack of access to care, and discusses how teledentistry might help. Greater coordination between dental professionals and other healthcare workers could help reduce the prevalence of dental caries and help patients maintain healthy mouths.

### **What are the real-world implications?**

With an understanding of the latest research on caries prevention and rehearsal, healthcare professionals can take a more active role, even if they aren't in the dentistry field.

### **What are the next steps?**

Ideally policymakers will be able to act on the information in this article when deciding how to allocate funding for health programs, especially preventative care.

Read more "Research in the Spotlight" features on the school web site:  
[dental.pacific.edu/researchspotlight](http://dental.pacific.edu/researchspotlight)

## NOTEWORTHY PUBLICATIONS

Congratulations to Dugoni School faculty, staff and student researchers involved in the following research publications within the last three months as sourced by Scopus, the abstract and citation database of peer-reviewed literature. Visit the abstract links to learn more.

Manikkath, J., Manikkath, A., Shavi, G.V., Bhat, K., Mutalik, S.

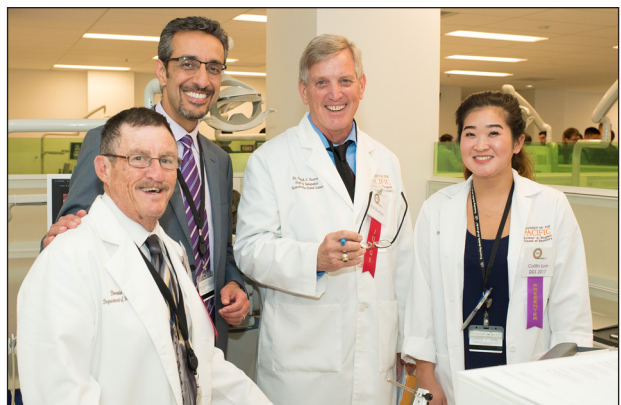
Low frequency ultrasound and PAMAM dendrimer facilitated transdermal delivery of ketoprofen (2017) *Journal of Drug Delivery Science and Technology*, 41, pp. 334-343.

[Abstract](#)

Xu, J., He, J., Yang, Q., Huang, D., Zhou, X., Peters, O.A., Gao, Y.

Accuracy of Cone-beam Computed Tomography in Measuring Dentin Thickness and Its Potential of Predicting the Remaining Dentin Thickness after Removing Fractured Instruments (2017) *Journal of Endodontics*, 43 (9), pp. 1522-1527.

[Abstract](#)



Nascimento, C.R., Andrade, D., Carvalho-Pinto, C.E., Serra, R.R., Vellasco, L., Brasil, G., Ramos-Junior, E.S., da Mota, J.B., Almeida, L.N., Andrade, M.V., Soeiro, M.N.C., Juliano, L., Alvarenga, P.H., Oliveira, A.C., Sicuro, F.L., de Carvalho, A.C.C., Svensjö, E., Scharfstein, J.

Mast cell coupling to the kallikrein-kinin system fuels intracardiac parasitism and worsens heart pathology in experimental chagas disease

(2017) *Frontiers in Immunology*, 8 (AUG), art. no. 840.

[Abstract](#)

Kelsch, N., Davis, C.A., Essex, G., Laughter, L., Rowe, D.J.

Effects of mandatory continuing education related to infection control on the infection control practices of dental hygienists

(2017) *American Journal of Infection Control*, 45 (8), pp. 926-928.

[Abstract](#)

Liu, S., Oh, H., Chambers, D.W., Baumrind, S., Xu, T.

Validity of the American Board of Orthodontics Discrepancy Index and the Peer Assessment Rating Index for comprehensive evaluation of malocclusion severity

(2017) *Orthodontics and Craniofacial Research*, 20 (3), pp. 140-145.

[Abstract](#)

Hwang, H.-S., Oh, M.-H., Oh, H.-K., Oh, H.

Surgery-first approach in correcting skeletal Class III malocclusion with mandibular asymmetry

(2017) *American Journal of Orthodontics and Dentofacial Orthopedics*, 152 (2), pp. 255-267.

[Abstract](#)

Silva, B.S.F., Bueno, M.R., Yamamoto-Silva, F.P., Gomez, R.S., Peters, O.A., Estrela, C.

Differential diagnosis and clinical management of periapical radiopaque/hyperdense jaw lesions

(2017) *Brazilian Oral Research*, 31, p. e52.

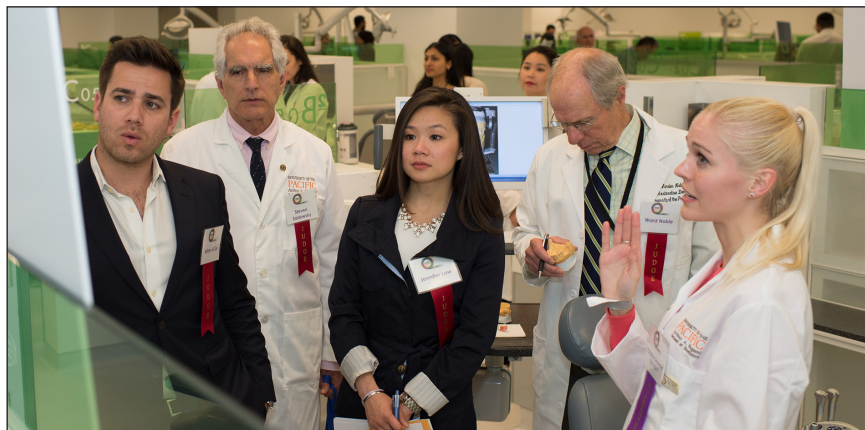
[Abstract](#)

Glassman, P.

Interventions Focusing on Children with Special Health Care Needs

(2017) *Dental Clinics of North America*, 61 (3), pp. 565-576.

[Abstract](#)



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## Research and Scholarship

Długaszewska, J., Szczolko, W., Koczorowski, T., Skupin-Mrugalska, P., Teubert, A., Konopka, K., Kucinska, M., Murias, M., Düzgüneş, N., Mielcarek, J., Goslinski, T.  
Antimicrobial and anticancer photodynamic activity of a phthalocyanine photosensitizer with N-methyl morpholiniumethoxy substituents in non-peripheral positions  
(2017) *Journal of Inorganic Biochemistry*, 172, pp. 67-79.

[Abstract](#)

Waldman, H.B., Perlman, S.P., Wong, A.  
The largest minority population in the U.S. without adequate dental care  
(2017) *Special Care in Dentistry*, 37 (4), pp. 159-163.

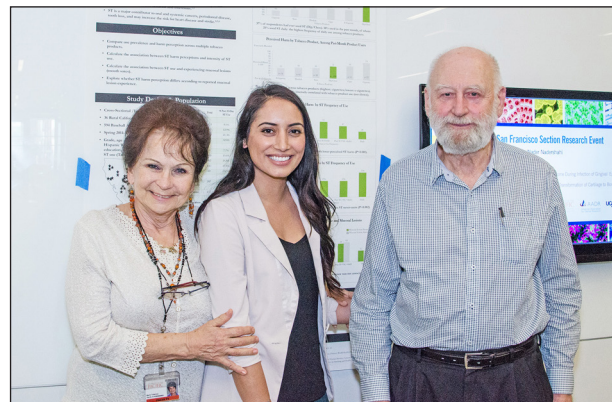
[Abstract](#)

Chen, X., Li, S.-J., Ojcius, D.M., Sun, A.-H., Hu, W.-L., Lin, X., Yan, J.  
Mononuclear-macrophages but not neutrophils act as major infiltrating anti-leptospiral phagocytes during leptospirosis  
(2017) *PLoS ONE*, 12 (7), art. no. e0181014.

[Abstract](#)

Source: Scopus, the largest abstract and citation database of peer-reviewed literature.  
Updated between July 1- September 14, 2017

Visit the publications page on the school website: [dental.pacific.edu/researchspotlight](http://dental.pacific.edu/researchspotlight)





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## Research and Scholarship

### PIPELINE

We're excited to acknowledge people who have submitted research projects for funding from external sources or have built new partnerships in efforts to advance our research and scholarship.

- ❑ Dr. Paul Glassman from the Pacific Center for Special Care and Drs. Mark Christiansen and Sig Abelson have submitted applications to request funding for continuing work to improve oral health among AIDS patients and in rural and other underserved communities.
- ❑ New research collaborations have been initiated by Drs. Anders Nattestad, Steven Sadowsky and Karen Schulze with Dr. Jill Helms' group at Stanford University to enhance osseointegration of implants.
- ❑ Dr. Art Dugoni has helped us to initiate a partnership with Helix12 in Palo Alto to screen compounds for their ability to inhibit inflammation, oral cancer or infection. This represents a new arrangement for our school, since the partner provides no funds for the collaboration but would share revenues with us for projects that lead to patents.
- ❑ Applications for research with corporate partners have been submitted by Drs. Miroslav Tolar, Ove Peter, Douglas Young, and Hee Soo Oh.
- ❑ Letters of intent have been submitted to the Chan and Zuckerberg Foundation, the Tobacco-Related Disease Research Program of California, or the Harold Amos Foundation by Drs. Der Thor, Tori Xiao, Ana Morandini, Taka Chino, and Johnah Galicia.
- ❑ Finally, the National Institutes of Health accepts applications every four months for multiyear grants. The following have submitted applications during the most recent submission period: Ana Morandini, Ove Peters, David Ojcius, Heesoo Oh, Johnah Galicia.

**Contact** *Insight*: Have a suggestion for the next issue of *Insight*? Contact Dr. David Ojcius, Assistant Dean for Research and Chair of the Department of Biomedical Sciences, for editorial suggestions or to learn more about how to get involved in research at the Dugoni School.

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