

Utilizing concept maps to help pediatric dental residents learn medical conditions

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1 | PROBLEM

Certain specialties in dentistry require students to acquire extensive medical knowledge in addition to becoming proficient clinicians. Pediatric dentistry serves as an example, necessitating commitment to memorization and retention of numerous pediatric medical diseases and syndromes. With the immense amount of knowledge required, many residents find difficulty in organizing and retaining information, which affects their application of the learned material during didactic exams and clinical care.

2 | SOLUTION

To become proficient with understanding pediatric diseases and syndromes, residents at the University of California, San Francisco 2-year pediatric dental residency program were instructed to construct “concept maps.” These illustrations allow learners to organize knowledge in a systematic manner by visually representing the relationship between correlated concepts. Studies have demonstrated that concept mapping improved students’ academic performance and helped them connect new knowledge with prior knowledge.^{1,2} By showing an introductory video called “How to use a mind map,” the residents gained insight on how to commence the project. Creativity was encouraged, as long as the following components were incorporated in the concept map: description, cause/pathophysiology, complications, treatment, and oral manifestations/dental management. Assessment of concept maps was based on these criteria: oral-systemic connection, ease of understanding, use of evidence-based

support, and organization of ideas. Additional points were awarded for using images in the concept map.

Two examples of concept maps created by a resident are shown below, the first illustrating an “anemia” diagram (Figure 1), and the second illustrating “infective endocarditis” (Figure 2). In Figure 1, colors and images were added strategically in certain locations to create an ineffaceable concept map, a technique called “method of loci.”³ This technique utilizes images to reinforce the retention of information. Figure 2 illustrates the student’s creativity by personifying parts of the heart, utilizing keywords that describe infective endocarditis.

3 | RESULTS

Upon completion of the assignment, residents reported enhanced confidence in treating medically compromised patients. They also felt more poised in discussing dental implications and treatment modalities with physicians who were involved with the patient’s care. Furthermore, residents demonstrated their creativity in the assignment by using colors and images in their concept maps. Creating a concept map takes more effort and time compared to passively reading the material. However, research has revealed that introducing some desirable difficulty into the learning process can lead to superior knowledge retention.⁴ As the integration of dental and medical sciences begins to progress, students need to absorb and apply massive amounts of information in a relatively short period of time. Concept maps provide an innovative way to help students manage and organize the information in meaningful ways, which might lead to enhanced understanding

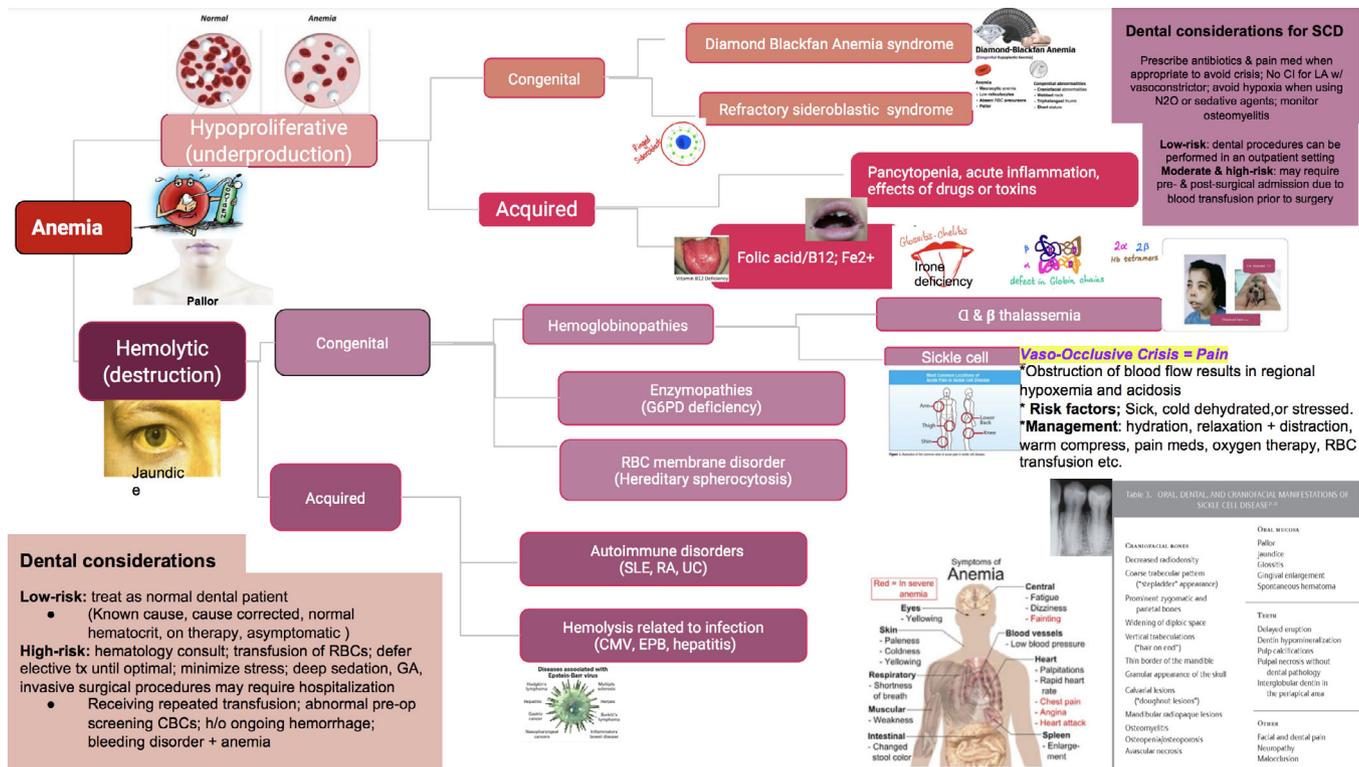


FIGURE 1 Anemia concept map

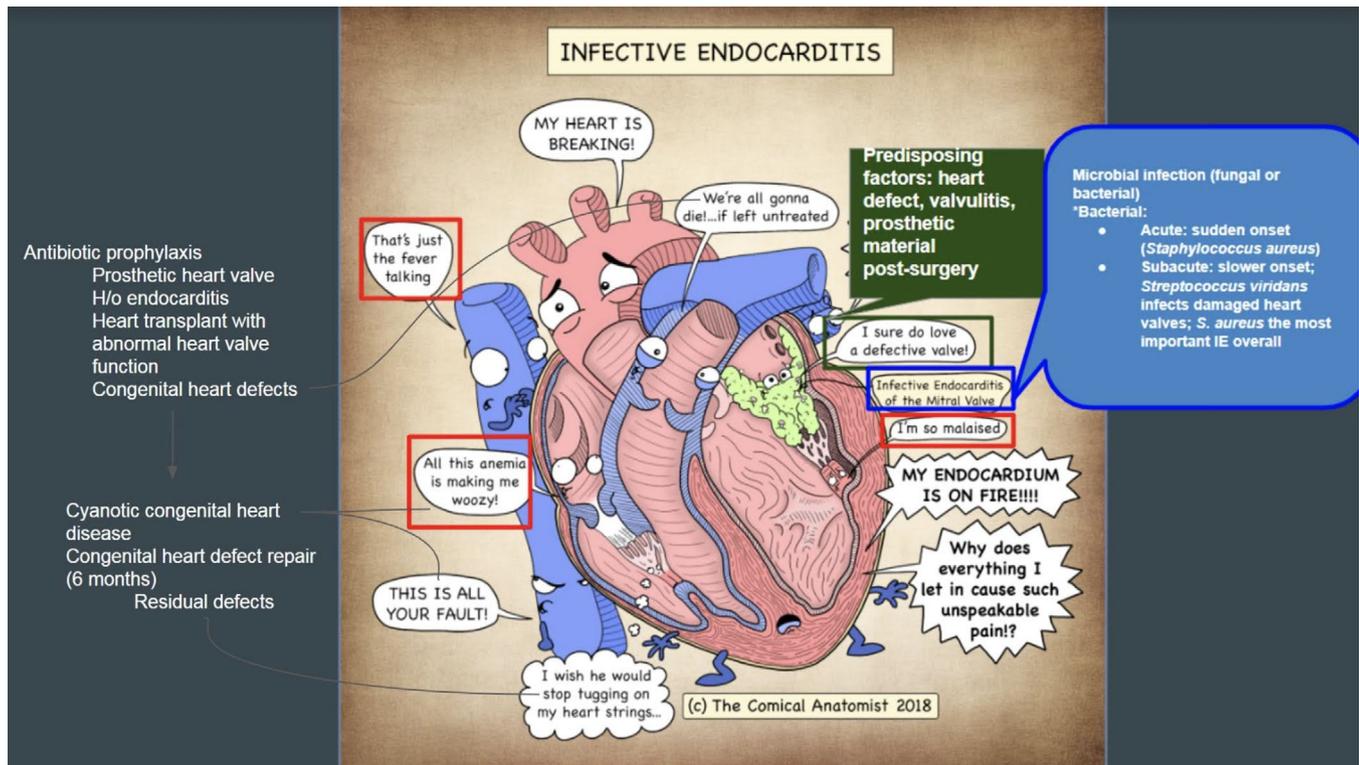


FIGURE 2 Infective endocarditis concept map

and longer retention. In addition to pediatric dentistry, concept maps can be applied to teaching and learning in other content areas such as oral surgery, pathology, and medical syndromes and diseases that require students to learn and retain great amounts of knowledge.

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