PSNet
PATIENT SAFETY NETWORK

Safety In Dentistry

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Perspective

In a famous scene from the 1976 film, *Marathon Man,* Laurence Olivier, playing dentist Dr. Christian Szell tortures Babe Levy (played by Dustin Hoffman) while repeatedly asking, "Is it safe?" When I (R.B.R.) was in dental school, some patients would tease me with that quote before I started their treatments. This question did not fill me with self-confidence, but it did spark an abiding curiosity about the safety of dental care.

On the surface, the answer is disturbingly clear: dental care, like medical care, is inherently risky. The high-speed dental handpiece (drill) is often used with a diamond-coated bur (bit) that rotates at up to 400,000 revolutions per minute (1) in close proximity to the patient's lips, tongue, and throat. It was no surprise, then, that a review of the literature (2) we conducted identified reports of serious lacerations and other injuries associated with high-speed handpieces.(3)

Consider next that sodium hypochlorite (bleach) is the solution most often used to irrigate the root canals of a tooth during endodontic (root canal) treatment. Sodium hypochlorite is highly cytotoxic. We identified several reports describing sodium hypochlorite being extruded past the apex (tip of the root) of the tooth into the surrounding tissues (4), or inadvertently injected into the mucosa instead of local anesthetic.(5) Because dental work occurs in close proximity to the airway, there were numerous reports of foreign body aspirations.(6) There have even been deaths associated with dental care, reported both in the scientific literature and in the media. One Associated Press news article wrote about a dentist who was "charged in the death of a patient who became unresponsive while having 20 teeth pulled and several implants installed."(7)

From Anecdotes to Understanding to Prevention

The events described above are a series of anecdotes. While they offer a glimpse into the risks of dental care, such stories cannot reveal the full picture, nor help us answer fundamental questions like how often someone aspirates a foreign body in the dental office. Much of foundational patient safety work in dentistry has been conducted in the acute care setting. The safety of care in ambulatory settings like the dental office is understudied, even though it is the far more common setting for care. Indeed, 65% of the American

population sees a dentist at least once per year (8), and dental care expenses exceed $100 billion annually in the United States.(9)

The process of moving from ignorance about risk to improved care is encapsulated in the four elements of AHRQ's Patient Safety Initiative: (i) identifying threats to patient safety; (ii) identifying and evaluating effective patient safety practices; (iii) teaching, disseminating, and implementing effective patient safety practices; and (iv) maintaining vigilance.(10) The elegance of this framework is that it applies equally across settings: whether in acute, long-term, or ambulatory care. Thus, the *what* is the same, but the *how* may be very different, depending upon the context.

What's Different About Dentistry?

Patient safety issues in dentistry share some features with ambulatory care in medicine, in that there are opportunities for diagnostic errors, patient factors play a significant role in safety events, and providers often have a longstanding relationship with their patients.(11) However, there are differences between ambulatory safety issues in dentistry and medicine. For instance, the range of medication errors may be narrower in dentistry, as fewer medications are used and prescribed. The nature of what is done in the clinic is also different: dental care encompasses a wide range of procedures, ranging from cleaning teeth to performing bone grafts. The largest distinguishing feature, though, may well be in the organizational characteristics of typical dental practices. The majority of the approximately 200,000 dentists in the United States work in sole proprietorships, in which individual dentists own their practices.(12,13) By contrast, under 20% of physicians are in solo practices, and over a quarter are in practices with more than 100 physicians.(14)

Additionally, dental insurance has evolved separately from medical insurance, and federal and state assistance for dental care is limited.(15) Finally, dental records are usually independent of medical records. Together, all of this means that dentists as individuals and dentistry as a profession cannot expect to benefit collaterally from the increasing interest in ambulatory safety. We must spearhead our own dental setting–focused patient safety efforts.

Making Dentistry Safer

Being among the small number of dental patient safety researchers, our goal is to create the tools and information dental care teams need to keep their patients safe. Our first objective is to contribute to the first element of the Patient Safety Initiative (10) by identifying threats to patient safety in the dental office. Our contributions to date include summarizing existing information sources (e.g., case reports), establishing a classification to help describe and organize the types of dental patient safety events (e.g., wrong site or wrong patient), creating a severity scale for dental patient safety events, and developing tools to efficiently detect dental charts that contain patient safety events.(2,16,17)

One important point we have learned from these efforts is that patient safety events may be common in dental practice: our early findings in four dental school clinics showed that a quarter of patients had experienced at least one such event (unpublished data). In our assessment of dental patient safety case reports in the professional and scientific literature, we found that the nearly a quarter (23%) of events were associated with delayed treatment and unnecessary treatment associated with misdiagnosis.(2) This

highlights the importance of diagnosis in dentistry, which has traditionally been seen as a procedure-focused profession. Although dentistry has standardized procedure codes, e.g., D6104 for bone graft at time of implant placement (18), the profession is only beginning to adopt standardized diagnostic terms.(19)

Clearly, though, the greatest hurdle is to establish a robust patient safety culture in the dental ecosystem.(20) As challenging as it has been to establish a safety culture in medicine, these efforts have been aided by significant funding and the organizational structure of large health care institutions, which can bring in relevant experts and can be made accountable (by regulators and payers) for performance. In contrast, the typical dental practice ecosystem is fragmented into small practices and lacks clear leadership.

Ultimately, patient safety, like politics, is local. Leaders of individual practices must not only decide to allocate resources to patient safety activities within a dental practice, they must also cultivate an environment in which individuals feel that talking about patient safety concerns is valued. Payers are positioned to be major influencers, as health care as a whole is moving into an era of accountability, in which incentives are aligned with the quality of care. Some larger group dental practices are already shifting toward pay-for-performance models.(21; Willamette Dental Group, oral communication, 2015) It is our hope that these pioneering practices are harbingers of a new profession-wide commitment to patient safety in dentistry in which each dental team member continually asks "Is it safe?" and strives to make dental care ever safer.

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