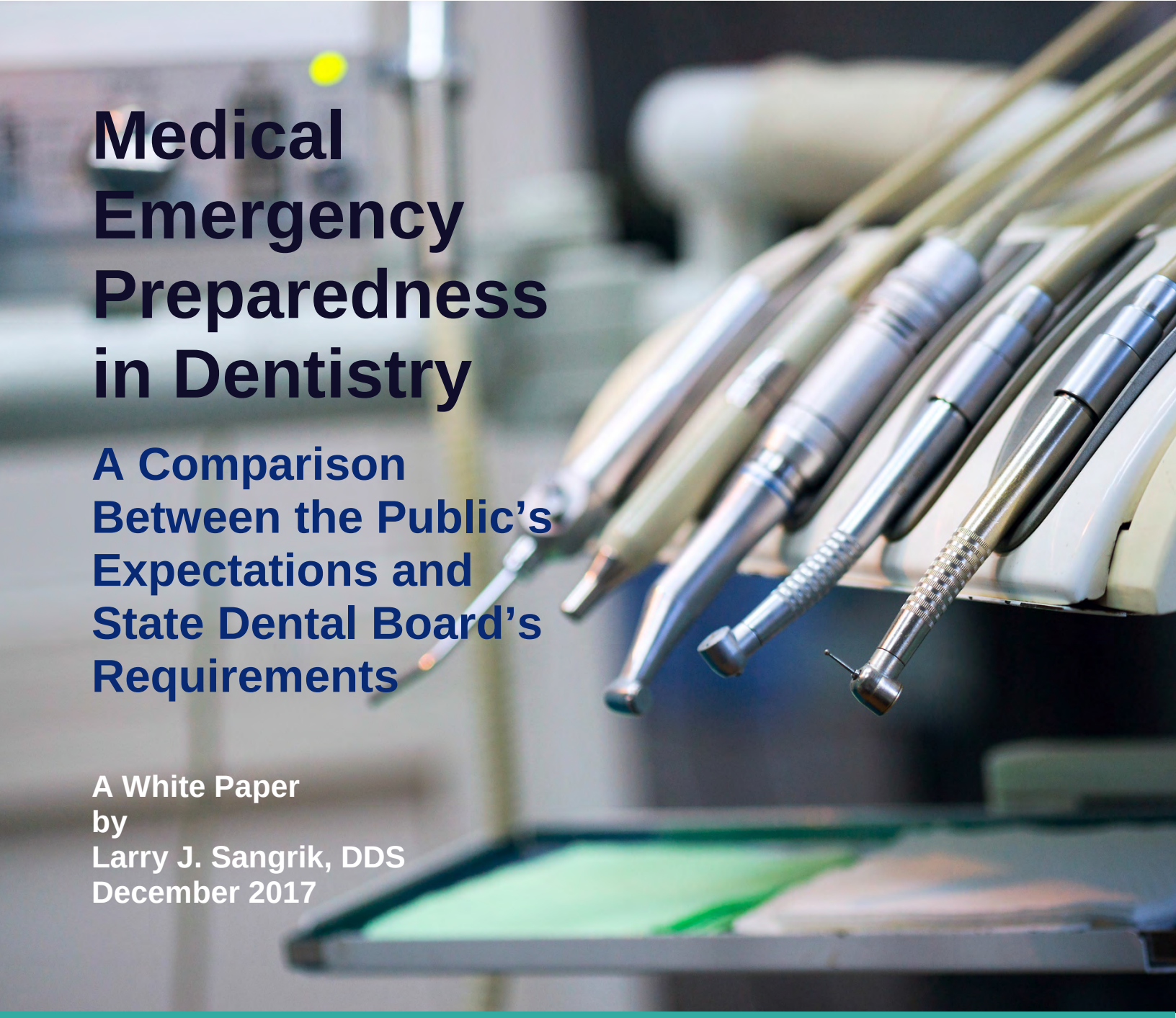

Medical Emergency Preparedness in Dentistry

A Comparison Between the Public's Expectations and State Dental Board's Requirements

A White Paper
by
Larry J. Sangrik, DDS
December 2017

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➢ Abstract

Various risk factors predict that medical emergencies occurring during dental treatment are increasing in frequency, diversity and intensity. State dental boards are charged with protecting the public by establishing and enforcing standards upon those licensed to provide dental care. This white paper compares patient expectations with regard to a general dental office's medical emergency preparations against the standards and requirements actually imposed by governmental agencies.

➢ Hypothesis

With regard to medical emergency preparedness in dental offices, a disparity exists between the public's expectations and the standards of the state dental boards which are charged with protecting their interests.

➢ Status Quo

Currently, the dental profession has no comprehensive mechanism to assess the extent or variety of medical emergencies that occur during the course of treatment. Moreover, no national standard exists on what constitutes reasonable preparedness for a medical event on the part of the dentist.

However, in 2018 the American Dental Association will release a medical emergency training tool for sale (4-part video and workbook). In that product, they will define a medical emergency as "any time the dentist's attention is diverted from the dental procedure (*or the associated anesthesia procedure*) to attend to the patient's physiological or psychological needs."

While a "medical emergency" can encompass many things, typically only fatalities are reported by the lay media. This leads to some erroneous conclusions both by agencies governing the dental profession and rank-and-file practicing dentists. These include:

1) When measured as a percentage of dental appointments, medical emergencies during dental treatment are extremely rare events. Many dentists believe they will never encounter one during their career.

2) Medical emergencies are always catastrophic events usually involving life-threatening events.

3) Medical emergencies during dental treatment occur disproportionately on children.

4) Medical emergencies during dental treatment usually are related to anesthesia complications; in particular, failure to identify and respond to a patient transitioning from moderate (conscious) sedation to deep (unconscious) sedation.

While the above statements might apply to ***fatalities*** occurring in dental offices, they are known to be not true for the much broader subject of ***all*** medical emergencies occurring during dental treatment.

In reality, known risk factors lead one to believe that medical emergencies during dental treatment are increasing in frequency, intensity and diversity.

1) The general population is aging. An older population means an increased presence of undiagnosed or untreated diseases associated with the aging process (e.g. cardiovascular disease, Type II diabetes).

2) Advances in medicine have resulted in dental patients with complex medical histories. The out-patient nature of most dental care meant that in the past, patients with serious medical conditions were eliminated from the pool of dental patients. If they survived their condition, they were often homebound. Today, medical treatment allows many people with major medical problems to not only survive but have a reasonable standard of living, including the ability to pursue dental treatment.

3) Dentistry has become more sophisticated. Along with being more invasive, some dental procedures now involve extensive periods of time.

4) The use of sedation is increasing in dentistry. This trend is likely to continue. Today's dental patient expects not only technical excellence, but also to receive care in comfort. All levels of sedation carry some level of inherent medical risk.

5) Implant dentistry is now commonplace. Dentistry, by its very nature, always presents some risk of aspiration. Fragments of teeth, broken instruments and dropped dental devices (e.g. crowns) have always been present. However, the minute abutments and screws associated with implant dentistry hold a particular risk of being dropped and aspirated.

Taken together, it is prudent that the dental profession take reasonable steps to insure dental offices can respond appropriately to medical events they may encounter.

➢ Methodology

This paper compares the findings of two previously unpublished studies. The first measured the public's expectations with regard to medical emergency preparedness in America's dental practices. The second study was a survey of state dental boards that sought to determine if priorities identified in the first study where reflected in various state's dental practice acts.

The first study, hereinafter the "*RMBF study*," was a privately-financed survey conducted in 2013 as part of National Children's Dental Health Month. It was developed by this author and conducted using SurveyMoney, an online service that provides rewards to people willing to complete surveys for various entities.

A total of 591 "signed on" to take the survey. Individuals under age 18 were instructed to terminate the survey.

The second study was a written survey of state dental boards conducted over 2016-17. In addition to the fifty states, opinions were sought from the dental boards of the District of Columbia, Puerto Rico and the U.S. Virgin Islands.

The Executive Director (or equivalent) of each state's dental board was mailed a single page questionnaire with reply envelope. The questionnaire asked a series of (multiple choice or T/F) questions corresponding to the six areas of medical emergency preparedness identified in the RMBF study.

Although many dental boards post their regulations online, it was felt that a common survey answered by the Board would eliminate bias or errors introduced by this paper's author when interpreting the laws, rules and regulations of a given state. Because the state's Executive Director of the dental board would be most familiar with the nuances of a given state's rules, he/she could answer most accurately. Such an individual could complete the survey in about two minutes.

The survey sought to determine the dental regulations regarding a "basic" dental license. A basic license was defined as the initial license required to practice dentistry. It may be held by either a general dentist or a specialist. In addition to use of local anesthetics, most states allow the dentist to administer nitrous oxide and/or prescribe an oral sedative in a dosage suitable for unsupervised, out-patient use. Regulations regarding advanced anesthesia services such as moderate sedation (aka conscious IV sedation), deep sedation or general anesthesia were not included as part of the survey.

Those states that failed to respond were sent a second identical questionnaire at 90 days. After an additional 90 days, those states that had not yet responded had a letter sent (with an

identical survey) to the Governor with a request that their office intervene and direct their dental board to reply.

Thirty-eight of the fifty-three dental boards (72%) eventually responded to one of the three requests.

The two studies were then compared to find both areas of commonality and differences in objectives.

➢ Background on the RMBF Study

In 2007, 9-year old Raven Maria Blanco of Virginia Beach died of respiratory arrest during a routine dental check-up. Subsequently, her parents established the Raven Maria Blanco Foundation (RMBF) in an effort to increase awareness of the dental community to better prepare for a medical emergency occurring during dental treatment.

The foundation was deeply influenced by two lecturers, Drs. John Roberson and Chris Rothman, who developed "*The Six Links of Survival*." The Six Links model advocated six unchanging tenets:

1) In addition to CPR every dentist needs periodic training for a wide range of medical emergencies.
2) In addition to CPR every member needs periodic training on medical emergencies to provide optimum assistance to the dentist.
3) Every dental office needs to regularly conduct mock drills on a wide range of emergencies.
4) Every dental office needs a written emergency plan to aid in identifying the nature of the emergency and assist the dental team in their response.
5) Dental offices need to stock emergency medications.
6) Dental offices need to maintain medical emergency equipment.

The specifics of these six tenets would vary depending on the nature of the practice. Although all dental office need a basic level of preparedness, those offices performing more invasive procedures and/or offering advanced anesthesia services (e.g. oral surgeons) would need to develop each "link" to a greater degree than an office that does not offer such services (e.g. orthodontists).

After several years of advocating medical emergency preparedness to organized dentistry and seeing little interest, RBMF considered pursuing a legislative tract. Before doing so, they wanted to test the validity of the "Six Links" hypothesis.

In celebration of the 2013 National Children's Dental Health Month, RMBF issued a grant to this author to determine if the "Six Links" model reflected the expectations of the general public.

After learning that the "Six Links" model was highly accurate in expressing the public's desires, RMBF tried to persuade their home state of Virginia to mandate protections for dental patients.

After failing to successfully enact change in either the Virginia's dental board or legislature, RMBF realized they lacked finances to successfully realize their goal. In late 2015 they discontinued their efforts.

Because the results of the 2013 study were never published, they gave ownership of the study to this author.

➢ Participants in the RMBF Study

Within the abilities and limitations of the study, the respondents represented a reasonable cross-section of the American population that utilizes dental services on a regular basis.

- ✓ Younger adults (18-32) represented about 20% of responders. Middle age (33-50) and older adults (over 51) each represented about 40%.
- ✓ There was a slight gender bias toward females (61%) answering the survey with males representing (39%).
- ✓ For reasons unknown, respondents were disproportionately from the south (40%). The other geographic sectors Northeast, Midwest and West were nearly identical around 20% each.
- ✓ Most respondents went to relatively small dental practices: Nearly 70% see a dental practice with one or two dentists, about 15% visit a practice with three or four dentists.
- ✓ Nearly two-thirds (63.11%) reported they see their dentist at least once a year and 69.14% indicated they had been a patient of the practice for 2 years or more.
- ✓ Three-quarter of the respondents believed their dentist's practice to be privately owned with about 10% saying it was corporately owned. About 1 in 8 were unsure.
- ✓ Roughly a quarter of the respondents described their dentist's practice as being located in an urban area. Nearly half described the office's location as "suburban," with the remaining quarter as "small town" or "rural."

➢ Conclusions from the RMBF Study

Taken as a whole, the study indicated that respondents recognize the following.

1) Dentistry is a sophisticated element of contemporary healthcare. As such, it appears they recognize there is a risk of medical events occurring in conjunction with dental treatment.

2) The evidence suggests that the public would accept the ADA's description of a medical emergency. This encompasses the concept that medical events during dental treatment range in diversity from minor events to major crises and may originate from causes other than operator error or anesthesia complications. .

More significant, are the specific conclusions that emerged:

1) **Status Quo:** Perhaps most importantly, respondents overwhelmingly believe their personal dentist's office is *already* highly and comprehensively prepared to manage a medical emergency. A significant portion of the survey asked participants to provide their perceptions about their personal dentist. Regardless of whether or not these expectations are actually true, they do reflect the level of confidence they place in their dental provider.

   - ✓ Nearly three-quarters (72%) of patients are highly or somewhat confident that their personal dentist has taken a medical emergency review course within what they believe to be a reasonable period of time.

   - ✓ Nearly two-thirds (64%) are highly or somewhat confident that the staff of their personal dentist has taken a medical emergency training program within a reasonable period of time.

   - ✓ Confidence (high or somewhat) in practicing mock drills fell to roughly four in ten (39.76%) in part because patient's expressed a high degree of uncertainty (28.48%) about their dentist's performance. Only one in three (36.27%) were confident their personal dentist was not holding mock drills.

   - ✓ Their belief (high or somewhat) that the following items are on the premises are as follows.

     - 57.65% Written emergency plan (21.49% unsure)
     - 61.75% Seven recommended medications (22.25% unsure)
     - 62.06% Assorted sizes of BP cuffs (22.22% unsure)
     - 75.89% Supplemental oxygen for breathing patients (17.19% unsure)
     - 69.18% Supplemental oxygen for non-breathing patients (21.17% unsure)
     - 62.47% AED (22.85% unsure)
     - 52.41% Glucose monitor (27.04% unsure)

   Overall, the pubic has an extremely high confidence that the entire dental team of their personal dentist is currently highly trained. They have significant (but somewhat less) confidence, that medications, manuals and equipment present to support the efforts of the people responding to the emergency.

2) **Training:** The public places an extremely high premium on the value of periodic training in medical emergency preparedness. The public was nearly evenly divided that dentists should receive periodic training every 3-5 years (34.89%), every two years (30.22%) and annually (34.69%). Only 1 person in 493 respondents did not feel periodic training was necessary.

   The American Heart Association has long held that efficacy in infrequently preformed procedures like Basic Life Support or Advanced Cardiac Life Support declines after two years. Approximately two-thirds of the population believes a similar frequency of retraining is necessary for other medical emergencies.

   In similar fashion, the public expects the entire dental team to receive periodic medical emergency training at least every five years with two of three expecting it every two years.

3) **Other Areas of Preparedness:** The public placed a high degree of importance on both mock drills and having a written emergency plan to guide a dentist throughout a crisis. Roughly seven of eight respondents saw value in mock drills with 94% seeing some degree of value in a written emergency plan.

   The survey deliberately placed little emphasis on the public *selecting* which medications and equipment should be available. Those decisions are best left to professionals. However, as previously stated, of the items offered, most believe their personal dentist already has them available.

Finally, the evidence supported that the public is already highly committed to the concept of medical emergency preparedness.

1) The survey questioned if any action would be taken if it was learned that their personal dentist was deficient in any one (of the six) areas of medical emergency preparedness. Nearly 80% said they would take some form of action. These included:

   - ✓ 6.53% would report the matter to their state dental board with the expectation of punitive action being taken against the dentist by the state.
   - ✓ 17.68% would report the matter to their state dental board with the expectation that the dentist's license would be temporarily suspended until the deficiency was resolved.
   - ✓ Nearly 1 in 5 (19.58%) would quietly change dentists.
   - ✓ Over 1 in 3 (36.00%) would confront the dentist and suspend treatment until they felt the deficiency was resolved.

2) The survey questioned attitudes about medical emergency preparedness between general (primary care) dentists and dental specialties. In most instances general dentists were expected to have similar states of readiness to most of the recognized specialties, with one exception.

   - ✓ As expected, most patients held oral surgeons (*defined to survey participants as "specialists in extractions, wisdom teeth, facial surgery and general anesthesia"*) to a higher standard than general dentists.

   - ✓ However, a surprising 1 in 5 (21.63%) stated that a general dental office should have *the same level* of medical emergency preparedness as an oral surgeon's office.

3) The survey questioned the public's willingness to pay for improved medical emergency preparedness. Although they assume their personal dentist is already prepared, they understood that cost could be incurred to see that other offices meet the same standard. Seven of ten patients stated they would pay over $1.00 per appointment to know all offices were compliant, with most willing to pay $2.00-5.00.

4) Finally, the survey revealed that if a medical emergency were to occur during treatment, the readiness (or lack of readiness) would affect two-thirds (68.53%) of patients in their decision to speak to an attorney regarding litigation.

➢ Conclusions from the State Dental Board Survey

Despite the risk factors previously stated, most state dental boards did not appear to have a comprehensive approach to medical emergency preparedness for their basic licensees.

TRAINING: 33 of 38 respondents required some level of post-dental school training in medical emergency preparedness. Of those, 31 (94%) solely required Basic Life Support (i.e. CPR). This suggests that state dental boards believe the most likely medical emergency during routine dental treatment is sudden cardiac arrest. However, there is no evidence to support the premise that sudden cardiac arrest is a widespread problem during routine dental care.

Of those states that required some type of medical emergency preparedness training for basic licensees, only one wrote their own requirements. It appears that state dental boards seek programs that are "pre-defined" (i.e. developed and written) by an outside entity (e.g., Basic Life Support for Healthcare Providers by the American Heart Association).

STAFF TRAINING: Although a number of dental boards required that *some* members of the dental staff maintain Basic Life Support competency, no state mandates that *all* members of the dental team (including business staff) be trained to operate as a cohesive team assisting a dentist during a medical emergency on a patient. While it is commendable that the American

Dental Association intends to offer a training tool specifically targeted at this need, the state dental boards do not currently appear to view staff training as a priority.

MEDICATIONS & EQUIPMENT: Of the 38 boards answering the survey, only eight (21%) required specific medications or equipment be available on the premises of a dentist with a "basic" dental license. Medication and equipment requirements broke down as follows:

The seven medications suggested by the American Dental Association and used as a basis by many lecturers was the most common requirement with six states (16%) requiring their presence in dental offices.

The presence of an AED came next with five of the responding states (13%) mandating it. Its requirement may be a consequence of the American Heart Association considering it a key component of Basic Life Support for Healthcare Professionals. This may be another example of state dental boards favoring the institution of standards developed by others. It also could be further evidence that dental boards view acute cardiac arrest as the condition for which they most want dentists prepared.

With regard to medications and equipment, perhaps the most disturbing concern was the low priority placed on providing supplemental oxygen. Of the 38 responding entities, only two states (Idaho and Massachusetts) reported requiring supplemental oxygen be available in all dental offices for both breathing and non-breathing patients. It is curious that two other states required supplemental oxygen to assist breathing patients but did not mandate that equipment be available if the patient degrades and stops breathing.

MOCK DRILLS: Only one state (New Jersey) required a mock emergency drill (once annually).

WRITTEN EMERGENCY PLAN: Seven dental boards (18%) reported requiring dentists to maintain a written emergency plan to guide them through a medical emergency. Observing other requirements also required with the emergency plan provides insight into the board's approach to medical emergency management.

Two state boards that required emergency plans had no requirement for any training or any equipment beyond CPR. A third board required an annual mock emergency drill but had no educational requirement, including no requirement for CPR. While the emergency manual may assist the dentist in identifying the nature of a medical emergency, the dental team will likely be ill prepared to respond to it without training, medications and equipment.

While the four remaining dental boards all required that the dentist maintain a drug kit containing the seven basic medications, only two of them required oxygen to be available. The paradox is that all medical emergencies except hyperventilation benefit from supplemental oxygen. One of the two boards requiring oxygen only required oxygen to be available for a breathing patient.

OTHER OBSERVATIONS: Several dental board respondents wrote unsolicited comments on the survey emphasizing that although they had little or no expectations of basic licensees, they had much stricter requirements for those individuals with advanced anesthesia privileges (sedation or general anesthesia). It is self-evident that those dentists with advanced anesthesia privileges need advanced training to manage complications of anesthesia (e.g. respiratory depression and airway management).

However, the comments also reflected an undesirable bias by the dental boards. The state dental board's behavior appears to reflect an attitude that medical emergencies during dental treatment equate to anesthesia complications and fatalities. The boards do not see non-lethal, non-anesthesia related events to be of significance or merit.

In reality, medical emergencies during dental care occur for one of three reasons: ① error by the dentist or dental team, ② a reasonable risk and sequela to treatment (e.g. syncope after injection) and ③ random events (e.g. patient experiencing a stroke). Errors managing complications in sedation or general anesthesia have generated most of the known dental office deaths and the greatest media interest; errors are likely the least likely cause of a medical emergency during dental treatment. A generation ago, Malamed identified that nearly half of all medical emergencies in a dental office are syncope (i.e. sequela to treatment). Given the tens of thousands of Americans receiving dental care on a typical weekday, it is reasonable to assume random events such as heart attacks, hypoglycemia, or stroke must be happening in such a large and varied population.

Based on their surveys, only Massachusetts attempted a comprehensive approach to medical emergency preparedness in all dental offices, coming close to Roberson's and Rothman's *Six Links of Survival*. They required all <u>*clinical*</u> staff to receive ongoing training in both Basic Life Support *and* general medical emergency preparedness. They required dental offices to stock the basic seven emergency medications, as well as have an AED, supplemental oxygen for both breathing and non-breathing patients and have a written emergency manual. Yet even they, while clearly well-intended far ahead of their peers, failed to recognize the importance of training all the staff (e.g. business office personnel) and the value of an emergency manual to provide guidance when a crisis occurs.

If the Roberson/Rothman Six Link's model does represent optimum preparedness for a medical emergency by a dental office (*and the public believes it does*), then no state or jurisdiction is currently mandating that dental offices follow it.

➢ Analysis and Comparison between the Two Studies

It appears the public intuitively senses the risk factors for medical emergencies during dental care. They suspect a variety of medical problems can develop during treatment ranging from minor to catastrophic. They do not view dental offices as mere places of public accommodation. Instead, they expect dentists to serve as well-trained first responders if any type of medical crisis were to develop, regardless of whether the emergency was a direct

result of the underlying dental care. Moreover, they presume the dentist functions as a first responder in a well-equipped environment and assisted by a competent staff.

By contrast dental boards currently view facilities of basic licensed dentists as inherently safe environments from a medical emergency perspective, similar to a general place of public accommodation such as a store, church or hotel. While only two responding states have no medical emergency requirements, 29 require only that someone on the dental team be current in CPR. If the American Heart Association is correct in their assertion that CPR is a basic skill that should be known merely as an act of good citizenship, then most dental boards are mandating little more than many non-healthcare employers require of their employees.

From a regulatory perspective, dental boards see their role in medical emergency preparedness as ***limited*** to requiring dentists to be competent to manage complications arising ***directly*** from the services offered (i.e. sedation/anesthesia). In this sense they are not reflecting the expectations of the public.

➢ Recommendations

If the risk factors for medical emergencies occurring during dental treatment are accurate, then state dental boards are failing to keep pace with both the current ***needs*** of the public and their ***expectations***.

Specifically, these include:

1) DENTIST TRAINING: Basic Life Support will always be ***one*** aspect of comprehensive medical emergency preparedness. However, dental boards need to take a much wider view of the medical emergency preparedness. Basic-licensed dentists need to receive ongoing training to address a variety of medical events, regardless of whether the underlying medical problem was a direct result of dental treatment. For example, if a patient were to become hypoglycemic during treatment, the public would likely expect a basic-licensed dentist to both accurately identify and respond to the condition.

   Based on current circumstances, appropriate medical emergency training for basic-licensed dentist will likely be the most challenging concept to address.

   State dental boards will likely remain small entities within much larger state governments. As such, it is unlikely they will ever have the resources to independently develop appropriate standards in areas such as medical emergency preparedness. As evidenced by their reliance on Basic Life Support (BLS) and Advanced Cardiac Life Support (ACLS) of the American Heart Association, state dental boards will seek to adopt standards developed by others.

   At present neither the American Dental Association nor other elements of organized dentistry appear interested in establishing criteria in medical emergency preparedness

for basic-licensed dentists. Perhaps an outside entity will emerge to fill the void. Hospitals already operate in this fashion. Instead of each state developing individual (and varying) standards of quality, both the state and the public rely on *The Joint Commission*, an independent entity. In similar fashion, a state dental board could reference recognized standards established by others without the labor and cost of developing a state-specific standard independently. Additionally, identical standards would be adopted by all states rather than subtle differences between jurisdictions.

2) COMPREHENSIVE COMPETANCY: In contrast to state dental boards which focus exclusively on the individual licensee, the public emphasizes a comprehensive approach to a competent environment (staff training, mock drills, proper equipment, defined protocols and appropriate medications). Although not asked as part of the survey, several states stated they conduct office inspections for dental offices offering sedation and/or general anesthesia. While this is probably not achievable given the budgets of most dental boards, it is reasonable that candidates for license renewal sign an affidavit that defined standards of medical emergency preparedness exist within all facilities in which they practice.

   Here, too, an independent entity that focuses on the facility (including the dentist) rather than the individual licensee might better reflect the public's expectations.

While some improvements in medical emergency preparedness fall within dental boards scope of responsibility, one area does not: access to a vendor offering a comprehensive approach to medical emergency preparedness. The Six Links approach can be divided into two groups. There are three educational needs: dentist training, staff training, and mock drills. Then there are physical items: emergency manual, medications and equipment. Because educational entities and purveyors of merchandise see their roles differently, there currently is no single vendor to whom a dentist can turn for an integrated, comprehensive source of all their medical emergency needs. Perhaps, if the dental boards place an increased emphasis on medical emergency preparedness, the private sector will respond.

➢ Summary

Comparison of the RMBF Study against those states that answered the dental board survey appears to confirm the hypothesis: ***the public has higher standards regarding medical emergency preparedness for dental offices than state dental boards currently require.***

Moreover, the public's expectations appear reasonable in light of known risk factors for medical emergencies occurring during dental treatment.

If the dental profession fails to respond to the public's reasonable expectations they may eventually turn elsewhere to have their needs met. Sadly, other areas of healthcare (e.g. anesthesiology) are already showing evidence of invading the dental profession.

As dental science advances, it is critical that leaders in the dental profession, both inside and outside of government, demonstrate to the public that all procedures from the most mundane to the most sophisticated are performed in a safe environment.

Appendix A

RMBF Study

Raw Data

Conducted for the 2013 National Children's Dental Health Month
by the
Raven Maria Blanco Foundation

Q1 Which best describes you?

Answered: 591 Skipped: 0

Responses	Percentage of those answering	
373	63.11%	I see a dentist regularly (check-ups at least once a year)
111	18.78%	I see a dentist occasionally (check-ups less than once a year)
097	16.41%	I only go to a dentist for emergency care (when in pain or for an acute issue)
010	01.69%	I never go to a dentist (not even in an emergency)

Q2 How long have you been a patient of your current general dentist?

Answered 580 Skipped 11

092	15.86%	Less than 2 years } (Skip Q3 and proceed to Q4)
401	69.14%	2 years or more }
087	15.00%	I do not currently have q general dentist (Proceed to Q3)

Q3 I currently do not have a dentist because…

Answered 86 Skipped 505

010	11.63%	I do not believe going to the dentist regularly is important
046	53.49%	I do not have dental insurance and cannot afford treatment
017	19.77%	I do not go to the dentist due to fear and/or anxiety
013	15.12%	N/A (I have a dentist)

Q4 How old are you?

Answered 504 Skipped 87

015	02.98%	Under 18
090	17.86%	18 – 32
186	36.90%	33 – 50
213	42.26%	51 or older

Q5 Are you male or female

Answered 504 Skipped 87

198	39.29%	Male
306	60.71%	Female

Q6 Is your dentist…
Answered 497 Skipped 94

390	78.47%	Male
107	21.53%	Female

Q7 In what area of the country does your dentist practice?
Answered 497 Skipped 94

099	19.92%	Northeast (*ME, NH, VT, MA, RI, CT, NY, PA, NJ*)
092	18.51%	Midwest (*WI, MI, OH, IL, IN, MO, ND, SD, NE, KS, MN, IA*)
200	40.24%	South (*DE, MD, DC, VA, WV, NC, SC, GA, FL, TN, MS, AL, OK, KY, TX, AR, LA*)
106	21.33%	West (*ID, MT, WY, NV, UT, CO, AZ, NM, AK, OR, CA, HI, WA*)

Q8 How many dentists practice in the dental office where you go for treatment?
Answered 497 Skipped 94

211	42.45%	One
132	26.56%	Two
052	10.46%	Three
021	04.23%	Four
034	06.84%	Five or more
047	09.46%	Unsure

Q9 Is the dental practice where you go for treatment…
Answered 497 Skipped 94

383	77.06%	Privately owned by the dentist(s)
051	10.26%	Corporately-owned
063	12.68%	Unsure

Q10 Where is the dental practice located?
Answered 497 Skipped 94

139	27.97%	Urban
222	44.67%	Suburban
109	21.93%	Small town
027	05.43%	Rural

Q11 How many dental hygienists practice in the dental office where you go for treatment?
Answered 497 Skipped 94

069	13.88%	One
093	18.71%	Two
073	14.69%	Three
137	27.57%	Four or more
125	25.15%	Unsure

Q12 In your estimation, how old is your general dentist?
Answered 497 Skipped 94

053	10.66%	25 – 35
278	55.94%	36 – 50
166	33.40%	51 or older

Q13 During dental school, all dentists are trained to deal with a wide range of medical emergencies which may occur during treatment. How often do you believe a dentist should review his/her training for a wide range of medical emergencies?
Answered 493 Skipped 98

071	14.40%	Every 5 years
101	20.49%	Every 3 years
149	30.22%	Every 2 years
171	34.69%	Every year
001	00.20%	Periodic review is not important

Q14 Based on your answer to the previous question, how confident do you feel your general dentist has received this training within the time period you expected?
Answer 493 Skipped 98

177	35.90%	I am highly confident my general dentist has done this training
178	36.11%	I am somewhat confident my general dentist has done this training
044	08.92%	I suspect my general dentist has not done this training
006	01.22%	I strongly believe my general dentist has not done this training
088	17.85%	Unsure

Q15 How important do you believe it is for your dentist's entire staff to be formally trained to assist in responding to a medical emergency occurring during dental treatment?
Answered 491 Skipped 100

318	64.77%	Extremely important
148	30.14%	Important
019	03.87%	Moderately important
005	01.02%	Limited importance
001	00.20%	Unimportant

Q16 How often do you believe your dentist's entire staff would need to be re-trained to assist in responding to a medical emergency?
Answered 491 Skipped 100

062	12.63%	Every 5 years
103	20.98%	Every 3 years
145	29.53%	Every 2 years
178	36.25%	Every year
003	00.61%	Periodic review is not important

Q17 Based on your answer to the previous question, how confident do you feel your dentist's staff is currently receiving this training within the time period you listed above?
Answer 491 Skipped 100

128	26.07%	I am highly confident my general dentist's staff has done this training
187	38.09%	I am somewhat confident my general dentist's staff has done this training
062	12.63%	I suspect my general dentist's staff has not done this training
014	02.85%	I strongly believe my general dentist's staff has not done this training
100	20.37%	Unsure

Q18 Hospitals routinely hold mock drills to prepare for various medical emergencies. How important is it for your dentist to hold mock drills to prepare for a medical emergency occurring during treatment?
Answered 488 Skipped 103

144	29.51%	Extremely important
156	31.97%	Important
130	26.64%	Moderately important
050	10.25%	Limited importance
008	01.64%	Unimportant

Q19 How confident are you that your dentist is currently holding mock drills with his/her staff to prepare for a medical emergency occurring during treatment?
Answered 488 Skipped

054	11.07%	I am highly confident my general dentist has done this training
140	28.69%	I am somewhat confident my general dentist has done this training
117	23.98%	I suspect my general dentist has not done this training
038	07.79%	I strongly suspect my general dentist has not done this training
139	28.48%	Unsure

Q20 Hospitals, schools and other entities that deal with the public have written emergency plans to help dictate a specific response and mitigate confusion. How important is it for your dentist to have a written plan specific for his/her office to address a medical emergency occurring during dental treatment?
Answered 484 Skipped 107

205	42.36%	Extremely important
182	37.60%	Important
069	14.26%	Moderately important
023	04.75%	Limited importance
005	01.03%	Unimportant

Q21 How confident are you that your dentist currently has a written plan?
Answered 484 Skipped 107

090	18.60%	I am highly confident my general dentist has a written plan
189	39.05%	I am somewhat confident my general dentist has a written plan
083	17.15%	I suspect my general dentist does not have a written plan
018	03.72%	I strongly believe my general dentist does not have a written plan
104	21.49%	Unsure

Q22 The American Dental Association recommends dentists stock seven specific medications for use during medical emergencies. However, no state requires a dentist to have them available. Hwo confident do you feel you dentist currently has all seven medications available? ① Aspirin (blood thinner for heart attacks) ② An asthma inhaler (Ventolin/Albuterol) ③ Nitroglycerin (used in heart attacks to open coronary arteries) ④ Diphenhydramine (trade name Benedryl®, used for minor allergic reactions) ⑤ Epinephrine (use in asthma, cardiac arrest and anaphylactic shock) ⑥Ammonia inhalants (fainting) ⑦ Glucose (low blood sugar).
Answered 481 Skipped 110

134	27.86%	I am highly confident my general dentist has all seven medications
163	33..89%	I am somewhat confident my general dentist has all seven medications
067	13.93%	I suspect my general dentist does not have all seven medications
010	02.08%	I strongly believe my general dentist does not have all seven medications
107	22.25%	Unsure

For Questions 23 -27, answer whether you believe your general dentist has the following medical emergency equipment.

Q23 At least three sizes of blood pressure cuffs to accommodate all sizes of patients

Answered 477 Skipped 114

120	25.16%	I am highly confident my general dentist has these devices
176	36.90%	I am somewhat confident my general dentist has these devices
065	13.63%	I suspect my general dentist does not have these devices
010	02.10%	I strongly believe my general dentist dones not have these devices
106	22.22%	Unsure

Q24 A method for providing extra oxygen for breathing patients

Answered 477 Skipped 114

190	39.83%	I am highly confident my general dentist has this device
172	36.06%	I am somewhat confident my general dentist has this device
028	05.87%	I suspect my general dentist does not have this device
005	01.05%	I strongly believe my general dentist does not have this device
082	17.19%	Unsure

Q25 A method of providing extra oxygen for a patient that has stopped breathing

Answered 477 Skipped 114

163	34.17%	I am highly confident my general dentist has this device
167	35.01%	I am somewhat confident my general dentist has this device
038	07.97%	I suspect my general dentist does not have this device
008	01.68%	I strongly believe my general dentist does not have this device
101	21.17%	Unsure

Q26 An automatic external defibrillator (AED), a device to electrically start a non-beating heart

Answered 477 Skipped 114

142	29.77%	I am highly confident my general dentist has this device
156	32.70%	I am somewhat confident my general dentist has this device
052	10.90%	I suspect my general dentist does not have this device
018	03.77%	I strongly believe my general dentist does not have this device
109	22.85%	Unsure

Q27 A glucose monitor (a device to measure the level of sugar in the blood)
Answered 477 Skipped 114

084	17.61%	I am highly confident my general dentist has this device
166	34.80%	I am somewhat confident my general dentist has this device
083	17.40%	I suspect my general dentist does not have this device
015	03.14%	I strongly believe my general dentist does not have this device
129	27.04%	Unsure

Q28 Based on your expectations, if you learned your dentist's office was deficient in any area, what would you likely do?
Answered 475 Skipped 116

031	06.53%	I would report the matter to the authorities (my state's dental board) and expect the dentist's license to be suspended for a specific period of time
084	17.68%	I would report the matter to the authorities (my state's dental board) and expect the dentist's license to be suspended until all areas are corrected.
093	19.58%	I would quietly change dentists
171	36.00%	I would confront the dentist and not continue treatment at that office until I felt the circumstances were changed
096	20.21%	I do not believe these issues are important when choosing a dentist. I would remain a patient.

Questions 29 – 33 ask you to compare the level of medical emergency preparedness you expect in your general dentist's office against various dental specialists.

Q29 Oral surgeons? (Specialists in extractions, wisdom teeth, facial surgery and general anesthesia)
Answered 467 Skipped 124

365	78.16%	Higher expectations for this specialist than a general dentist
101	21.63%	Similar expectations for this specialist and a general dentist
001	00.21%	Lower expectations for this specialist than a general dentist

Q30 Endodontists? (Specialists in root canal therapy)
Answered 467 Skipped 124

292	62.53%	Higher expectations for this specialist than a general dentist
174	37.26%	Similar expectations for this specialist and a general dentist
001	00.21%	Lower expectations for this specialist than a general dentist

Q31 Perioodontists? (Specialists in treating gum diseases)
Answered 467 Skipped 124

199	42.61%	Higher expectations for this specialist than a general dentist
254	54.39%	Similar expectations for this specialist and a general dentist
014	03.00%	Lower expectations for this specialist than a general dentist

Q32 Orthodontists? (Specialists in moving teeth with braces)
Answered 467 Skipped 124

145	31.05%	Higher expectations for this specialist than a general dentist
286	61.24%	Similar expectations for this specialist and a general dentist
036	07.71%	Lower expectations for this specialist than a general dentist

Q33 Pediatric dentists? (Specialists in dentistry for children)
Answered 467 Skipped 124

250	53.53%	Higher expectations for this specialist than a general dentist
211	45.18%	Similar expectations for this specialist and a general dentist
006	01.28%	Lower expectations for this specialist than a general dentist

Q34 Currently, state dental boards have very few requirements for medical emergency preparedness. Eight states have no requirements. Preparing dental offices in all six areas of medical emergency preparedness would take time and money. How much would you be willing to pay out-of-pocket, per appointment, to cover the costs of increasing medical emergency preparedness in your dentist's office?
Answered 467 Skipped 124

141	30.19%	$5.00 per appointment
098	20.99%	$2.00 per appointment
089	19.06%	$1.00 per appointment
010	02.14%	$0.50 per appointment
009	01.93%	$0.25 per appointment
120	25.70%	I would be unwilling to accept any fee increase to enhance medical emergency preparedness in my dentist's office.

Q35 Would your positive or negative perceptions of your dentist's overall preparedness for a medical emergency occurring during your dental treatment influence your decision to speak to an attorney regarding possible litigation, if a medical event occurred?

Answered 467 Skipped 124

103	22.06%	Yes, if my dentist was well-prepared, I would be less inclined to speak to an attorney.
070	14.99%	Yes, if my dentist was poorly prepared, I would be more inclined to speak to an attorney.
147	31.48%	Yes, to both of the above.
147	31.48%	No, my perceptions regarding my dentist's preparations for an emergency would not influence my decision to speak to an attorney.

Appendix B

Survey of
STATE DENTAL BOARDS
on
Medical Emergency Preparedness

Autumn 2016 – Spring 2017

↓ STATE ↓	Dentist / BLS	Hygienist / BIS	Dent Asst / BLS	Busin staff / BLS	Dentist / Gen Emerg Trining	Hygienist / Gen Emerg Training	Dent Asst / Gen Emerg Training	Busin staff / Gen Emerg Training	Mock Emerg Drills	Medications (Basic 7)	AED	O_2 / Breathing patient	O_2 / Non-breathing pt.	O_2 / No specifications	Glucose Monitor w/ strips	Pulse Oximeter	Written Emerg Plan
Alabama	✓	✓															
Alaska																	
Arizona																	
Arkansas	✓	✓	✓								✓	✓					
California	✓	✓	✓	✓						✓							✓
Colorado																	
Connecticut																	
Delaware	✓	✓															
Florida																	
Georgia																	
Hawaii	✓	✓															
Idaho	✓	✓								✓		✓	✓				

Gray denotes the dental board either: ① never replied after three attempts or ② replied stating that they would not answer the survey.

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STATE DENTAL BOARDS
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Medical Emergency Preparedness

Autumn 2016 – Spring 2017

↓ STATE ↓	Dentist / BLS	Hygienist / BIS	Dent Asst / BLS	Busin staff / BLS	Dentist / Gen Emerg Trining	Hygienist / Gen Emerg Training	Dent Asst / Gen Emerg Training	Busin staff / Gen Emerg Training	Mock Emerg Drills	Medications (Basic 7)	AED	O_2 / Breathing patient	O_2 / Non-breathing pt.	O_2 / No specifications	Glucose Monitor w/ strips	Pulse Oximeter	Written Emerg Plan
Illinois																	
Indiana		✓															
Iowa	✓	✓	✓							[1]							✓
Kansas	✓	✓															
Kentucky	✓	✓				✓[2]				✓	✓						✓
Louisiana	✓																
Maine																	
Maryland	✓	✓															
Massachusetts	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓			✓	✓
Michigan																	
Minnesota	✓	✓	✓		[3]	[3]	[3]			✓							
Mississippi																	

[1] Iowa requires a first aid kit chosen by the dentist but does not specify that it contain any medications. Not included in final tally
[2] Three hours of live CE every two years.
[3] Minnesota dental professionals must take 2 courses from a list of 6 topics. Medical emergency management is one to the choices. However, it is not a requirement. Not included in final tally because not all individuals are required to participate.

Appendix B

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STATE DENTAL BOARDS
On
Medical Emergency Preparedness

Autumn 2016 – Spring 2017

↓ STATE ↓	Dentist / BLS	Hygienist / BIS	Dent Asst / BLS	Busin staff / BLS	Dentist / Gen Emerg Trining	Hygienist / Gen Emerg Training	Dent Asst / Gen Emerg Training	Busin staff / Gen Emerg Training	Mock Emerg Drills	Medications (Basic 7)	AED	O_2 / Breathing patient	O_2 / Non-breathing pt.	O_2 / No specifications	Glucose Monitor w/ strips	Pulse Oximeter	Written Emerg Plan
Missouri	✓	✓															
Montana	✓	✓															
Nebraska																	
Nevada	✓	✓															
New Hamp.	✓	✓															
New Jersey[4]		[5]							✓[6]								✓
New Mexico																	
New York	✓										✓						
N. Carolina	✓	✓	✓														
N. Dakota	✓	✓	✓														
Ohio		✓	✓														
Oklahoma																	

[4] This state reported they are in the process of updating their medical emergency requirements. Answers are based on requirements at the time the survey was completed.
[5] Only if practicing under general supervision. Since not all RDHs included, not included in final tally.
[6] Annual mock drill

Appendix B

Survey of
STATE DENTAL BOARDS
on
Medical Emergency Preparedness

Autumn 2016 – Spring 2017

↓ STATE ↓	Dentist / BLS	Hygienist / BIS	Dent Asst / BLS	Busin staff / BLS	Dentist / Gen Emerg Trining	Hygienist / Gen Emerg Training	Dent Asst / Gen Emerg Training	Busin staff / Gen Emerg Training	Mock Emerg Drills	Medications (Basic 7)	AED	O_2 / Breathing patient	O_2 / Non-breathing pt.	O_2 / No specifications	Glucose Monitor w/ strips	Pulse Oximeter	Written Emerg Plan
Oregon	✓	✓															
Pennsylvania	✓	✓	[7]														
Rhode Is.[4]	✓	✓	✓														
S. Carolina																	
S. Dakota																	
Tennessee	✓	✓	✓														
Texas	✓	✓	✓		✓					✓							✓
Utah	✓	✓															
Vermont																	
Virginia	✓	✓															
Washington	✓	✓	✓								✓						
W. Virginia	✓	✓				[8]				[9]	[9]	[9]	[9]		[9]	[9]	

[4] This state reported they are in the process of updating their medical emergency requirements. Answers are based on requirements at the time the survey was completed.
[7] Only if dental assistant is an expanded function dental assistant. Since not all assistants are required, not included in final tally.
[8] Only if practicing under general supervision. Since not all assistants are required, not included in final tally.
[9] "Recommended" but not required. Not included in final tally.

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STATE DENTAL BOARDS
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Medical Emergency Preparedness

Autumn 2016 – Spring 2017

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Wisconsin	✓	✓															
Wyoming	✓	✓															
Dist of Col	✓	✓	✓														
Puerto Rico	✓	✓	✓														✓
USVI																	
Raw Score→	33	33	14	1	2	2	1	1	1	6	5	3	2	0	0	1	7
TOTALS[10] Percentage[11]→	87%	87%	37%	3%	5%	5%	3%	3%	3%	16%	13%	8%	5%	0%	0%	3%	18%

[10] Based on 38 participants
[11] Rounded to nearest whole number

Appendix B

I am conducting a national research project on the STATE BOARD REQUIREMENTS regarding dental offices and their ability to respond to a medical emergency on a patient. Please complete the following survey (*about 1 minute*) and return in the envelope provided. Base your answers on a standard dental office (*e.g. a general dental practice with no advanced anesthesia privileges*). Kindly reply within 7 days. Thank you, in advance for your assistance.

Your state:

❶ Does your board require BASIC LIFE SUPPORT (aka CPR) for the following? (*Check all that must attend*)

☐ Dentist ☐ Hygienist ☐ Clinical Assistants ☐ Business Staff ☐ No requirements

❷ Does your board require a MEDICAL EMERGENCY PREPAREDNESS COURSE on topics *other* than full cardiac arrest? (*Check all that must attend*)

☐ Dentist ☐ Hygienist ☐ Clinical Assistants ☐ Business Staff ☐ No requirements

If yes, how many hours? _____ If yes, how often? _____ years

❸ Are dental offices in your state required to hold MOCK MEDICAL EMERGENCY DRILLS?

☐Yes, how often? _____ ☐No

❹ Does your board require dental offices to stock EMERGENCY MEDICATIONS?

☐ Yes, "basic seven" recommended by most lecturers on medical emergency preparedness for dentists (*aspirin, diphenhydramine, nitroglycerin, albuterol inhaler, epinephrine, glucose, ammonia inhalants*)

☐ Yes, other list (please specify) _____

☐ No emergency medications are required

❺ Does your board require dental offices to maintain specific medical EMERGENCY EQUIPMENT?

☐ AED
☐ Supplemental oxygen for *breathing* patients
☐ Supplemental oxygen for *non-breathing* patients
☐ Oxygen, but *no specifications* regarding equipment
☐ Glucose monitor & test strips
☐ Pulse oximeter
☐ No emergency equipment is required

❻ Does your board require dental offices to maintain a written MEDICAL EMERGENCY RESPONSE PLAN?

☐ Yes, a professionally published one
☐ Yes, one from any source including one made by the office
☐ No