

2014 Update on Basic Physical Diagnosis:

Reducing the Occurrence of Many Medical Emergencies in the Dental Office

Dr. Daniel G. Pompa

Oral and Maxillofacial Surgeon

Today there are many medically compromised patients coming to our offices. “The U.S. and global population demographics are constantly changing, chronic diseases are becoming more prevalent, new medications are being developed and brought to the market.”¹ Many of these patients are often treated in dental offices without an adequate medical history and evaluation being taken prior to the onset of treatment.

It has been estimated that at least one or two office related deaths may occur during the career of a typical dental practitioner. These would not necessarily occur during the office visit, but could happen within 24 hours after the initial treatment.^{2,3}

The overwhelming majority of medical emergencies that occur in dentistry happen during or immediately after local anesthetic administration. Anything a doctor can do to minimize stress at this time serves to prevent potential problems from developing.⁴ “More than 50% of all postoperative deaths are cardiac in nature.”⁵ “Over 50% of emergencies that occur in the dental office are syncope or simple fainting.”⁶ Even this *simple* fainting episode, improperly managed, may and has resulted in a fatal outcome.

This article will describe four important recommendations that can easily be implemented in any dental office that are all non-invasive, cost effective, easy to learn and can be performed by the dentist or knowledgeable staff members.

Recommendation # 1:

A) Use the “**DASH**” approach for an updated Medical History.

Ask the patient,

“**Since your last visit to our office have you had any:**

1) Drugs prescribed by your doctor?

2) Allergies or bad reactions to any medications, foods or environmental factors/ items?

3) Surgeries performed (major or minor)?

4) Hospital visits or hospital stays?”

This should be documented in the chart for every visit and completed by the doctor or a staff member, and the patient. It should then be initialed and dated by both. I would recommend an ink stamp, pre-printed labels or a standard outline form on a digital history format, as follows:

D _ A _ S _ H _

//_ date and _____ initialed _/_/_ date and _____ initialed

For any positive **DASH response, the doctor must be notified**

prior to the initiation of *any* dental treatment

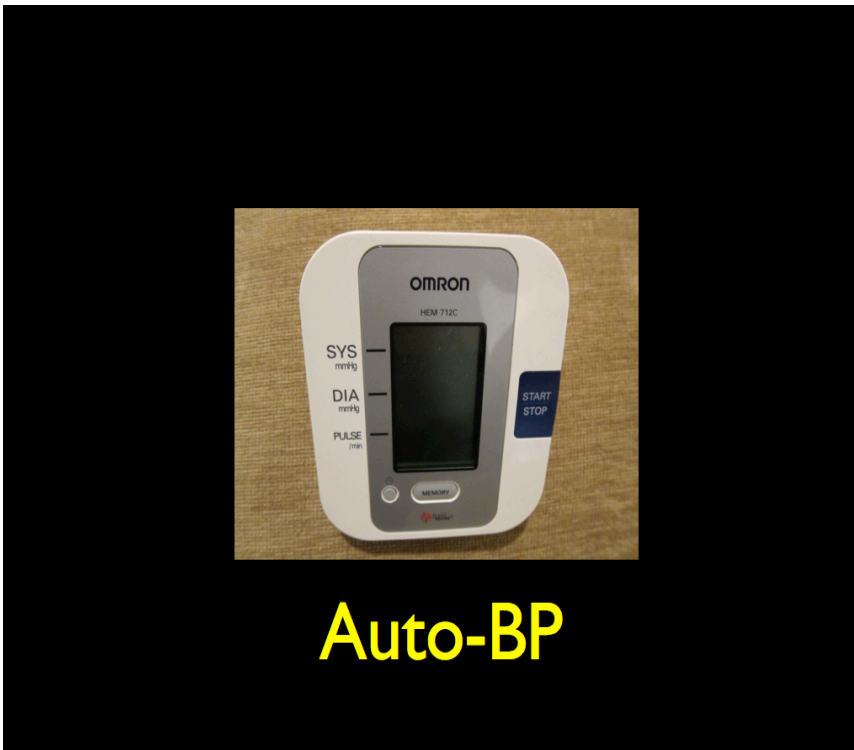
B) Ask the question: “Has your driver’s license ever been suspended or revoked for any reason?” (This may indicate a medical condition(s) such as uncontrolled diabetes, vestibular balance disorders, epilepsy and alcohol abuse which the patient may otherwise fail to disclose.)

C) Measure and document the patient’s blood pressure. Hypertension is the “Silent Killer,” since it is a contributing factor to a number of other medical conditions and is often undiagnosed. Note that the drug inserts for local anesthetic agents state that a BP should be recorded when a local anesthetic is administered. This can be done with either an automatic apparatus or with a manual one. Many automatic devices also register pulse readings. The typical local anesthetic drug insert states:

“Cardiovascular vital signs (BP) and respiratory vital signs...should be monitored after each local anesthetic injection.” The insert further states that when administering a dental block (inferior alveolar)...” Patients receiving these blocks should have circulation (BP) and respiration monitored and be constantly monitored.”* ⁷

The above is in the fine print, and, as such, we are responsible for its content. Failure to comply could place the dentist at risk for legal action should the administration of the local anesthetic precipitate a medical emergency. In our legal system, ignorance is no excuse for an untoward outcome.

Therefore:



Recommendation # 2:

Purchase an automatic blood pressure machine with different cuff sizes to appropriately fit pediatric, adult, and obese patients, and, preferably, register the pulse at the same time. These can range from \$65 to \$100+, depending on optional

features such as: a printout, and/or a USB connection to download multiple readings. Many are capable of detecting the presence of arrhythmias.

Recommendation # 3

Determine the Rate Pulse Product as follows:

Rate Pulse Product (RPP): is a number that is determined by: multiplying the Systolic BP X the Pulse Rate

For example: 120/82 is the BP and the pulse is 80.

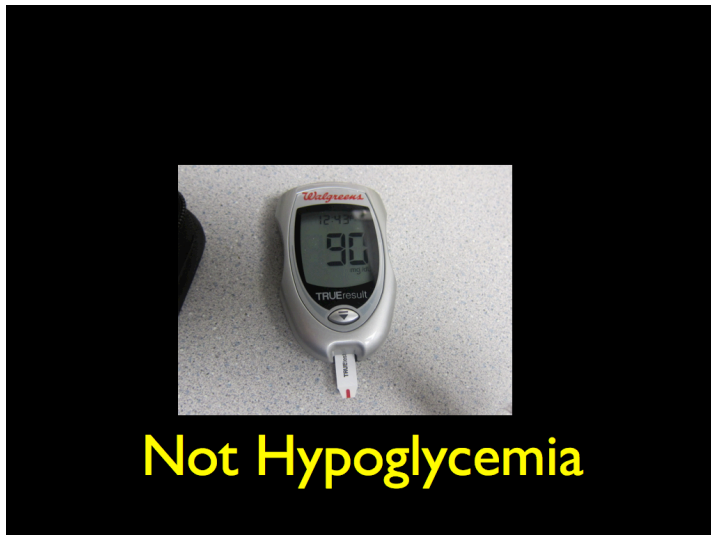
Therefore the RPP would be $120 \times 80 = 9,600$

Any resulting product over 12,000 is of concern, as this patient may be at higher risk for developing a sudden medical emergency. This is especially true if there is a history of cardiac disease, angina, congestive heart disease and, now, according to the latest medical evidence, diabetes. Many of these patients should be considered for referral to their primary care physician for a diagnostic workup. Some of these patients should also be considered for oral anxiolytic premedication prior to dental treatment and others may elect to be treated with IV sedation. These options should be presented, discussed, and reviewed.

Recommendation # 4

Have a Glucometer in the office

Since diabetes is the fastest growing condition in the U.S. and is now considered a *Cardiac Disease Indicator* rather than a risk factor for cardiac disease, a greater portion of the medical history should be devoted to questions about this medical disorder. For example: *When was your last blood test (for diabetes) and what was the result?* If unknown, and you suspect hypoglycemia, then use a Glucometer.



A Glucometer can be purchased at most drugstores and some brands include free test strips. Total cost is usually under \$20.

Recommendation # 5

Purchase a Pulse Oximeter

In the past, a Pulse Oximeter would cost thousands of dollars, however, today the cost is less than \$50. It can be purchased in a local drugstore or ordered online. Besides indicating the patient's pulse rate, in real time, throughout the procedure (vs. the automatic BP/ pulse indicator which does not), it also tells you the Oxygen Saturation Percentage, which indicates the percentage of blood that is loaded with oxygen. More specifically, it measures what percent of hemoglobin (the protein in red blood cells that carry oxygen) is saturated. This is a very precise indicator of oxygen perfusion. Normal readings are between 95% and 100%. If it is lower than 93%, supplemental oxygen should be considered.** The Oxygen Saturation Percentage is important, as the lower the saturation, the more likely it is that the patient can go into a crisis, as the parameters for a safety zone are significantly diminished. Administering supplemental oxygen when the oxygen saturation is below 93% can significantly reduce the probability of a cardiac perfusion and/or respiratory exchange crisis from occurring both intra-and post-operatively.

The pulse rate is the most important indicator of the cardiovascular system, followed closely by the blood pressure. The Systolic BP correlates with changes in myocardial oxygen demand and the Diastolic BP is the important determinant of coronary perfusion.⁸

The pulse oximeter also registers the pulse in **real time**. A patient experiencing stress/



anxiety and also having an increased pulse rate will experience less oxygen supplying the myocardium. This is because oxygen is only delivered to the myocardium during the phase of the heart cycle known as *Diastole*. With this increasing pulse, the relative time of the *Diastole* phase is reduced along with a corresponding increase in relative time given to *Systole*. If the heart muscle should already be compromised, this could become a problem. Therefore, a rising pulse, as **seen and heard** on

the pulse oximeter, could be a strong indicator for a potential cardiac/angina episode. This could be preempted and avoided by determining (pre-treatment) the Rate Pulse Product as well as being apprised (both visually and by sound) of an increasing pulse rate **prior to and/or during** any dental procedure.

Dealing with a medical emergency after it occurs is much more difficult than preventing one from occurring. Not all emergencies can be determined or prevented prior to their occurrence, however, implementing these recommendations can potentially reduce the likelihood of a medical crisis from taking place in your office.

Case History:

You have a 22 y/o male patient sitting in your dental chair experiencing an episode of altered consciousness. You now record a BP of 136/96, BUT you take the BP after the patient experiences this problem. (If the BP were taken prior to the emergency it would have been recorded as 140/100.) Without a baseline which to compare, you are clueless as to what is a good differential diagnosis. The patient is maintaining consciousness but is talking in a slurred speech and looking at you as if he does not know who you are. You believe the patient is in pre-syncope or in a hypoglycemic state. You do not have a glucometer. (If you did, you would find his blood sugar to be 60, he is a diabetic and was only asked if he took his meds today to which he replied that he did. The question not asked was, "Did you eat after taking your medication and how long ago did you take the *insulin*?") It is now one hour since he took his insulin (the amount of time for the signs

and symptoms to occur for insulin shock) and you find out he was late and rushed to arrive at the office on time. Your patient is now sweating, confused, and you think he is going to faint. You administer spirits of ammonia and 100% oxygen. He now worsens and becomes unconscious. You support his airway and continue to give 100% oxygen, but he is not responding. You call 911 but there was just a power failure in your building and your phone is not working. Concurrently there is a blizzard and the response time (you find out by calling on your cell phone) is at least 1 hour. What do you do? And what could you have done to prevent this from escalating to this point? There is a simple solution to this crisis that does not involve an IM or IV route of administration of a drug.

Find out the answers to these questions as well as others by taking Dr. Pompa's course in Syracuse on Saturday, March 8th or attending one of his other seminars listed below.

Having the correct up-to-date equipment, knowing where it is and how to use it, and taking a good medical history could make all the difference in this and many other situations.

Since complications most often occur without any fault on the part of the practitioner and are foreseeable, and many predictable, the reasonable health care provider should be aware of optimal immediate and long term treatment for these complications.⁹

* A constant monitoring device, that is cost effective, easy to use, and readily accessible would be the use of the pulse oximeter. (This would be in compliance with the drug insert and may even be above the standard of care for a dental office not delivering IV or general anesthesia.)

** This is somewhat controversial when dealing with patients with Chronic Obstructive Pulmonary Disease (COPD), but for a short-term procedure, it should not be withheld.

“By failing to prepare you are preparing to fail.”

Ben Franklin

References:

- (1) The ADA Practical Guide to Patients with Medical Conditions, Lauren L. Patton, Wiley-Blackwell, Publication, 2012 by the ADA
- (2) McCarthy, R.M.: Sudden Death, Anesth. Symposium II, South. Calif. Soc. Oral Surg., April, 1973.
- (3) McCarthy, R.M.: Death in the dental office: failure to administer proper aid can bring ruin to a dentist's career, American Dent. Assoc. News 5:6, Dec. 2, 1974.
- (4) Handbook of Local Anesthesia: Dr. Stanley F. Malamed, Fifth Edition 2004, Elsevier Mosby Co.
- (5) Mangano D.M: Perioperative cardiac morbidity. Anesthesiology 1990;72:153
- (6) Malamed, S.F., JADA, Managing Medical Emergencies, 1993 Aug. p40-50.
- (7) Drug insert for Lidocaine HCL 2% and Epinephrine 1:100,000 USP Rx only, Solutions for local anesthesia in Dentistry. Manufactured by Novocol
- (8) Saraghi, Mana, DMD. "Medical Emergencies in the Dental Office" Presentation given at the 2013 reater New York Meeting.
- (9) "Handbook of Local Anesthesia" Chapter 19 by contributor Dr. Daniel L. Orr II, "Legal Considerations" see (4) above.

"Update on Medical Emergencies: How to Save a Life, Including Your Own, 2014"

This presentations will teach you how to respond to a life-threatening crisis in your office or anywhere. The indications for emergency drug use along with the appropriate dosages will be reviewed. Developing and maintaining an Emergency Drug Kit will be taught. We will distribute and teach you to use laminated color-coded instructional cards, depicting each emergency and the suggested treatment for that emergency with a clear plan to follow. This Seminar incorporates interactive live demonstrations, hands-on drug administration with a multimedia presentation format.

In addition to presenting to the NYSAGD (New York State Academy of General Dentistry) in Syracuse on March 8, 2014 Dr. Pompa is scheduled to be present this Full Day Seminar both locally and nationally on the following dates: Feb. 28, 2014 at the Queens County Dental Society, March 27th, 2014 in Houston, Texas, May 4, 2014 in Sands Point, Long Island, May 21, 2014 in Baltimore, Maryland, September 28, 2014 in New Jersey and on November 21, 2014 in Alexandria, Virginia. The Houston, Baltimore and Virginia presentations are through the *ADA Seminar Series program*.



Dr. Daniel Pompa is an oral and maxillofacial surgeon and a Fellow of The American Association of Oral and Maxillofacial Surgeons. Dr. Pompa is a Seminar Series Speaker for the American Dental Association and an on-line Author as well. He has lectured extensively and has been published in such journals as the Journal of the American Dental Association and Dentistry Today, where he has also been listed as one of the “Leaders in Continuing Education.”

For more information and to contact Dr. Pompa he can be reached at (516) 287-0917 or DPompaOMS@gmail.com.
