HIGH BLOOD PRESSURE AND ORAL HEALTH: WHAT’S THE LINK?

Angela F. Filzen, D.D.S.
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“...............for out of the abundance of the heart the mouth speaketh.”
Learning Objectives

• Explore the relationship between oral health and high blood pressure

• Discuss oral manifestations caused by the adverse effects of antihypertensive drugs

• Discuss drug interactions between antihypertensive and drugs used in dentistry

• Identify the role of the dentist in the management of patients with cardiovascular disease
**HIGH BLOOD PRESSURE AND ORAL HEALTH**

**KNOW YOUR NUMBERS**

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**What is the AHA recommendation for healthy blood pressure?**

This chart reflects blood pressure categories defined by the American Heart Association.

<table>
<thead>
<tr>
<th>Blood Pressure Category</th>
<th>Systolic mm Hg (upper #)</th>
<th>Diastolic mm Hg (lower #)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normal</strong></td>
<td>less than 120</td>
<td>and less than 80</td>
</tr>
<tr>
<td><strong>Prehypertension</strong></td>
<td>120 – 139</td>
<td>or 80 – 89</td>
</tr>
<tr>
<td><strong>High Blood Pressure (Hypertension) Stage 1</strong></td>
<td>140 – 159</td>
<td>or 90 – 99</td>
</tr>
<tr>
<td><strong>High Blood Pressure (Hypertension) Stage 2</strong></td>
<td>160 or higher</td>
<td>or 100 or higher</td>
</tr>
<tr>
<td><strong>Hypertensive Crisis</strong></td>
<td>Higher than 180</td>
<td>or Higher than 110</td>
</tr>
</tbody>
</table>

* Your doctor should evaluate unusually low blood pressure readings.
The role of the dentist in the management of patients with cardiovascular disease

TO IDENTIFY PATIENTS WITH HYPERTENSION, BOTH DIAGNOSED AND UNDIAGNOSED

TO ROUTINELY MONITOR BLOOD PRESSURE WHICH ALLOWS FOR CO-MANAGEMENT OF THE DISEASE
In 1963 the American Society of Anesthesiologists (ASA) adopted the five-category physical status classification system. This is a system for assessing the fitness of patients before surgery. It currently comprises six categories:

1. Healthy Person
2. Mild systemic disease
3. Severe systemic disease
4. Severe systemic disease that is a constant threat to life
5. A moribund person who is not expected to survive the operations
6. A declared brain dead person whose organs are being removed for donor purposes
ASA I

Patients are considered to be healthy, non-smoking, with no or minimal alcohol use. All major organs and organ systems appear in good health. Patients are able to walk up one flight of stairs or two level city blocks without distress. Little or no anxiety. Little or no risk during dental treatment. This classification represents a "green flag" for all dental treatment, usually not needing a medical consult unless other flags go up about patient hiding medical concerns when presented with an unhealthy general physical assessment.
ASA II

Patients have mild to moderate systemic disease or are healthy ASA I patients who demonstrate a more extreme anxiety and fear toward dentistry. Patients are able to walk up one flight of stairs or two level city blocks, but will have to stop after completion of the exercise because of distress since they do not have substantive functional limitations. Minimal risk during dental treatment. This classification represents a "yellow flag" for treatment, with a slight warning flag indicating to proceed with caution with all dental care. Examples: History of well-controlled disease states including non-insulin dependent diabetes, prehypertension, epilepsy, asthma, or thyroid conditions; ASA I with a mild respiratory condition, pregnancy, and/or active allergies as well as current smoker and/or social alcohol drinker including obesity (30 < BMI < 40). May need medical consultation before all dental care.
ASA III

Patients have one or more moderate to severe systemic diseases that limits activity, but is not incapacitating. Patients are able to walk up one flight of stairs or two level city blocks, but will have to stop enroute because of distress and thus have substantive functional limitations. If dental care is indicated, stress reduction protocol and other treatment modifications are indicated. This classification represents a "yellow flag" for treatment, with a slight to strong warning flag indicating to proceed with extreme caution during dental treatment. Examples: History of more than three months of angina pectoris, transient ischemic attack, myocardial infarction, cerebrovascular accident, congestive heart failure, coronary artery disease with stents, slight chronic obstructive pulmonary disease, and poorly controlled insulin dependent diabetes or hypertension as well as morbid obesity (BMI ≥40), active hepatitis, alcohol dependence or abuse, implanted pacemaker, moderate reduction of ejection fraction, end-stage renal disease undergoing regularly scheduled dialysis. Will need medical consultation before all dental care.
ASA IV

Patients have severe systemic disease that limits activity and is a constant threat to life. Patients are unable to walk up one flight of stairs or two level city blocks. Distress is present even at rest. Patients pose significant risk since patients in this category have a severe medical problem of greater importance to the patient than the planned dental treatment. Whenever possible, planned dental treatment should be postponed until such time as the patient's medical condition has improved to at least an ASA III classification. This classification represents a "red flag", with a strong warning flag indicating that the risk involved in treating the patient is too great to allow planned dental care to proceed. Examples: History of less than three months of unstable angina pectoris, myocardial infarction, cerebrovascular accident, severe congestive heart failure, coronary artery disease with stents, ongoing ischemia or severe valve dysfunction, severe reduction of ejection fraction, sepsis, disseminated intravascular coagulation, moderate to severe chronic obstructive pulmonary disease, including uncontrolled diabetes, hypertension, epilepsy, or thyroid condition as well as renal failure with refractory ascites and end-stage renal disease not undergoing regularly scheduled dialysis. If emergency treatment is needed, medical consultation is still indicated.
ASA V

Patients are moribund and are not expected to survive more than 24 hours with or without an operation. These patients are almost always hospitalized, terminally ill patients. Elective dental treatment is definitely contraindicated; however, emergency care, in the realm of palliative treatment may be necessary. This classification represents a “red flag" for dental care and any care is done in a hospital situation. Examples: History of ruptured abdominal or thoracic aneurysm, massive trauma, intracranial bleed with mass effect, ischemic bowel in the face of significant cardiac pathology or multiple organ or system dysfunction.
ASA VI

Clinically dead patients being maintained for harvesting of organs.

It is important to note that ASA status can change as medical history changes so it is important to update before all dental procedures; modified by Margaret J. Fehrenbach, RDH, MS, from the American Society of Anesthesiologists as well as Medical Emergencies in the Dental Office (Malamed, Mosby), which uses traffic lights instead of the usual medical record flags (see pages 53-56). See Wikipedia that sites this chart for more information.
Oral health link to heart trouble

US tests find that heart patients had more bacteria in their mouths

WASHINGTON: People with the most germ-infested mouths are the most likely to have heart attacks, United States researchers reported yesterday.

A study that compared heart attack victims to healthy volunteers found the heart patients had higher numbers of bacteria in their mouths, the researchers said. Their findings add to a growing body of evidence linking oral hygiene with overall health.

Dr. Oelisok Andriankaja and colleagues at the University at Buffalo in New York were trying to find out if any species of bacteria might be causing heart attacks.

Their tests on 386 men and women who had suffered heart attacks and 840 people free of heart trouble showed that two types of bacteria - *Tannerella forsythia* and *Prevotella intermedia* - were more common among the heart patients.

But more striking, the people who had the most bacteria of all types in their mouths were the most likely to have had heart attacks, they told a meeting of the International Association of Dental Research in Miami.

"The message here is that even though some specific periodontal pathogens have been found to be associated with an increased risk of coronary heart disease, the total bacterial pathogenic burden is more important than the type of bacteria," said Dr. Andriankaja, who is now at the University of Puerto Rico.

"In other words, the total number of bugs is more important than one single organism," she said.

Doctors are not sure how bacteria may be linked with heart attacks but several studies have shown associations between gum disease and heart disease.

In Singapore, while cardiac experts said that no local research had been carried out on the link between oral hygiene and heart problems, they said a connection could not be ruled out.

Dr. Stanley Chia, associate consultant at the National Heart Centre's cardiology department, said that bacterial infection in general can cause changes to blood vessels, raising the risk of heart attacks. So, bacteria from the mouth could enter the bloodstream and possibly trigger a chain reaction leading to heart attacks, he said.

And with four out of five adult Singaporeans believed to have some form of gum disease, the latest study may act as a reminder to brush up on oral hygiene.

As Dr. Koh Chun Gwan, senior consultant at the periodontics unit of the National Dental Centre, observed: "A lot of Singaporeans don't visit a dentist and do not know about dental diseases."

REUTERS

Additional reporting by April Cheng in Singapore
HIGH BLOOD PRESSURE AND ORAL HEALTH

Gum Disease and Heart Disease: The Bacteria Connection

- **Bacteria from the mouth** enter the bloodstream through the gums.
- Oral bacteria stick to fatty plaques in the bloodstream, directly contributing to blockages.
- Oral bacteria trigger an inflammatory response, causing the blood vessels to swell, reducing blood flow and increasing the risk of clots.

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“Both periodontal disease and cardiovascular disease are inflammatory diseases, and inflammation is the common mechanism that connects them,” says Dr. David Cochran, DDS, PhD, President of the AAP and Chair of the Department of Periodontics at the University of Texas Health Science Center at San Antonio.

For individuals with and without periodontitis (the most severe form of gum disease), frequent tooth brushing was found to accompany a decreased prevalence of hypertension.

Overall, study participants with poor oral hygiene habits were more likely to have higher hypertension frequency.

“Associations Among Oral Hygiene Behavior and Hypertension Prevalence and Control”
Journal of Periodontology, July 2015
Oral manifestations caused by the adverse effects of antihypertensive drugs

- XEROSTOMIA
- GINGIVAL HYPERPLASIA
- LICHENOID REACTION
- LOSS OF TASTE/TASTE ALTERATION
THE ROLE OF THE DENTIST IN THE MANAGEMENT OF PATIENTS WITH CARDIOVASCULAR DISEASE

DRUG INDUCED GINGIVAL HYPERPLASIA

Healthy Gingiva

Moderate gingival enlargement

Severe gingival enlargement

Management of drug-induced gingival enlargement
Aust Prescr 2003;26:11-3 | 1 January 2003
Barbara Anne Taylor, Department of Periodontics, United Dental Hospital of Sydney, Sydney
“DENTAL TREATMENT IN HYPERTENSIVE PATIENTS NECESSITATES SPECIAL ATTENTION, BECAUSE ANY STRESSFUL PROCEDURE MAY INCREASE BLOOD PRESSURE AND TRIGGER ACUTE COMPLICATIONS SUCH AS CARDIAC ARREST OR STROKE”
Drug interactions between antihypertensive and drugs used in dentistry

Dental Considerations:
- Control of pain and anxiety is very important in patients with high medical risks
- Shorter appointments
- Local anesthetics with epinephrine should be decreased/low doses
- No use of retraction cords with high epinephrine
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TAKE HOME RECOMMENDATIONS

- {Annual} Cross-training of dental team with medical team on proper taking of blood pressure, which includes observational assessments and competency assessments.
- Use of Patient assessment tool like that of ASA at initial visit-updated as patient medical history changes.
- Standard dental protocol to take blood pressure readings on all patients, every visit
  - Post operative blood pressure for surgical procedures
  - Protocol should include blood pressure readings for elective treatment, referral, etc.

Incorporate triage protocol with medical for elevated blood pressures being referred over.
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RESOURCES

- Little and Falaces's: Dental Management of the Medically Compromised Patient, Eighth Edition
- B Taylor, Department of Periodontics, United Dental Hospital of Sydney, Sydney, “Management of drug induced gingival enlargement”, Aust Prescr 2003:26:11-3, 1 January 2003
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CONTACT INFORMATION

ANGELA F. FILZEN, D.D.S.
DIRECTOR, OFFICE OF ORAL HEALTH
MISSISSIPPI STATE DEPARTMENT OF HEALTH
570 E WOODROW WILSON
JACKSON MS 39215
601-576-7500
Angela.Filzen@msdh.ms.gov
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