

## ***Antibiotics before Dental Work?***

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*Dr Kennedy, I have a murmur and mitral valve prolapse (MVP). Should I still be taking antibiotics before going to the dentist?*

In my practice I get this question multiple times on a weekly basis from both dental professionals and patients.

The question of who should and should not receive antibiotics before dental procedures is important and confusing because new recommendations are dramatically different than recommendations in the past.

To better understand the change I think it's first important to understand why antibiotics prior to dental procedures for certain individuals were recommended in the first place.

### **Bugs—**

Certain bacteria normally exist on the surface of our skin, in our mouth, and in our GI and urinary tracts. During dental procedures these bacteria can be introduced into our blood stream. In most people the bacteria are quickly cleared without any untoward clinical consequence. However, in some patients with congenital heart conditions or prosthetic heart valves for example, bacteria can cause a potentially lethal complication known as infectious endocarditis (IE).

In high risk individuals altered or turbulent blood flow is created for example across a prosthetic valve or through a congenital defect such as a hole between the two bottom chambers of the heart.

This abnormal high velocity blood flow traumatizes the surface of the delicate cardiac tissue known as endothelium which line the heart valves, blood vessels and inner surface of the heart. Damaged endothelium promotes clots with platelet and fibrin deposition, upon which bacteria can take hold. This clotting on the valve provides a place for the bacteria to attach themselves and for an infection to be established. Next, bacteria multiply and proliferate forming a collection known as a vegetation. The vegetation releases more bacteria into the blood stream where they can travel to infect additional organs such as the brain and spleen.

### **Drugs (antibiotics to prevent endocarditis)**

To prevent this potential complication, individuals with heart murmurs (which are caused by turbulent blood flow across leaky or blocked heart valves and of which MVP is an example) received antibiotics designed to kill bacteria usually found on the surface of the skin. The most common antibiotic prescribed for patients without a known allergy is penicillin.

### **Individuals at highest risk for IE:**

- Congenital heart conditons
- Intavenous drug users

- Colorectal cancer
- Weakened immune system (low white blood cell counts)

### **Why were antibiotics recommended in the past?**

1. IE is an uncommon but life-threatening disease, and prevention is preferable to treatment of established infection.
2. Certain underlying cardiac conditions predispose to IE.
3. Bacteremia with organisms known to cause IE occurs commonly in association with invasive dental, GI, or GU tract procedures
4. Antibiotic prophylaxis was proven to be effective for prevention of experimental IE in animals.
5. Antibiotic prophylaxis was thought to be effective in humans for prevention of IE associated with dental, GI, or GU tract procedures.

### **Why recommendations have changed:**

1. IE is much more likely to result from exposure to random bacteremia associated with daily activities than from dental, GI or GU tract procedures.
2. Prophylaxis may only prevent an exceedingly small number of IE, if any, in people undergoing dental, GI or GU tract procedures.
3. The risk of antibiotic-associated adverse events such as allergic responses exceeds the benefit, if any, from antibiotic prophylaxis.
4. Maintenance of optimal oral health and hygiene may reduce the incidence of bacteremia from daily activities and is more important than prophylactic antibiotics for a dental procedure to reduce the risk of IE.

### **Your Heart—Heart Conditions Still Requiring Antibiotic Prophylaxis:**

- Prosthetic cardiac valve or prosthetic material used for valve repair
- Previous history of IE
- Unrepaired Cyanotic Congenital Heart Conditions
- Heart conditions with prosthetic material for 6 months post op (to allow for endothelialization)
- Repaired Congenital Heart Conditions with residual defects (turbulent flow)

### **Summary**

- According to new guidelines, many fewer patients are candidates to receive IE prophylaxis. Although long assumed that dental procedures may cause IE, scientific proof is lacking to support these assumptions. Data suggests that total number of cases of IE caused by bacteremia from a dental procedure is exceedingly small.
- The vast majority of cases of IE caused by oral microflora most likely result from random bacteremias caused by routine daily activities, such as chewing food,

- tooth brushing, flossing, use of toothpicks, use of water irrigation devices, and other activities.
- Data also suggests we should focus more on dental hygiene to prevent IE, especially in patients at highest risk.
  - MVP is the most common underlying condition that predisposes to acquisition of IE in the Western world; yet, the absolute incidence of endocarditis is extremely low for those with MVP, and it is not usually associated with the grave outcomes.

***Thus, IE prophylaxis is no longer recommended for this group of individuals.***

- Finally, the administration of prophylactic antibiotics is not risk free and widespread use promotes the emergence of resistant microorganisms.

*Dr. John Kennedy is an invasive cardiologist and board member of the American Heart Association. He has a particular interest in the negative impact of stress on our cardiovascular system and speaks regularly to businesses about managing stress in the workplace. Dr. Kennedy is co-author of the book "Breathe: Heal Your Heart in Just 15 Minutes a Day," which will be released by John Wiley & Sons in February 2009.*



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