I'm sure you get calls on a regular basis from dentist's offices requesting antibiotic prescriptions for routine dental work for many of your patients. I do. Sometimes, despite my arguing that the patient doesn't need the antibiotics, the dentist insists and will not do the work without the script.

Well, the guidelines have now been updated and many more of our patients don't need antibiotic prophylaxis for dental, gastrointestinal (GI), and genitourinary (GU) procedures. Will that stop the dentists from calling? Maybe not, but we have an obligation to inform them of the new guidelines if they are not yet in the know.

The new American Heart Association (AHA) guideline updates the 1997 guideline. The very low risk of getting infectious endocarditis from GI, GU, and dental procedures and possible adverse events from taking the antibiotics were taken into account when devising the new recommendations. In fact, it is more common to get bacteremia leading to infective endocarditis from daily activity than from a dental procedure. For only the highest-risk cardiac defects does the AHA now state that prophylaxis “is reasonable” (see Table 1). Since there have been no randomized controlled trials (RCTs) comparing prophylaxis to no prophylaxis, the AHA has changed their wording to state that prophylaxis “is reasonable” whereas it was “recommended” in the past. The bottom line is that we don’t know if it is effective in preventing infective endocarditis.

What types of dental, GI, and GU procedures qualify for prophylaxis? Any dental procedure where oral mucosa is perforated and procedures...
Practicing and Teaching Medicine with a PDA in 2008

continue to proliferate faster than I can write this article.

In the last year, the free version of Epocrates became available for the newer Blackberry PDAs. While this does not include all the databases for diagnosis and infectious diseases available in the Essentials version, it does include most of the drug database minus the alternative medicine products. When the iPhone was released, there was great demand from physicians to have an Epocrates version that would work on that PDA. Epocrates just responded by making a public announcement that it is working with Apple developers to create a version of Epocrates software installed directly on the iPhone (not requiring Internet access). Epocrates has already released a special site that is formatted directly for the iPhone browser and works well as long as the phone has Internet access.

PDAs are still a great way to carry important medical information with you wherever you go. There are thousands of medical applications that are free and available for purchase. A useful popular program produced by an STFM group is the Shots program, which is updated yearly. Take a look a MedMeister.com, developed by an STFM member, to find many free programs that work with iSilio (a special document reader). Included are two programs that I helped develop for family physicians—DermMeister and the Family Medicine Maternity Guide. There are many evidence-based medicine programs that are available for purchase developed by STFM members such as DynaMed and Inforetriever (now known as Essential Evidence Plus). These and many more medical programs are great to use when teaching medical students and residents. Find out what software your students are using and ask them to look up answers to clinical questions on their PDAs. It gives them a sense of contributing to the patient care and can help you get answers to questions quickly.

Whether you choose to combine your PDA with your phone or carry a stand-alone PDA, information that you carry will help you practice and teach medicine. David Eddy said “The complexity of modern medicine exceeds the inherent limitations of an unaided human mind.” Don’t hesitate to aid your mind with the PDA. It is still the best way to add gigabytes to your own internal hard drive memory and extend your human mind.

Richard Usatine, MD, University of Texas Health Science Center at San Antonio, Editor

Thomas Agresta, MD, University of Connecticut, Coeditor
involving the gingival tissue or periapical portion of the tooth qualify. This includes biopsies, suture removal, and orthodontic band placement but not anesthetic injections, X rays, or orthodontic adjustment. GI procedures including esophagoduodenoscopy (EGD) and colonoscopy with biopsies do not require prophylaxis nor do elective GU procedures in a patient without a urinary tract infection (UTI). But, if a procedure is not elective and infection is present, appropriate antibiotic coverage is warranted (typically for enterococcus).

Respiratory tract procedures and procedures on infected skin and muscular tissue should be treated as appropriate to the infection. Patients undergoing surgery of the respiratory tract, such as tonsillectomy and adenoidectomy, who have conditions listed in Table 1, are reasonable to treat prophylactically as in Table 2.

Antibiotic choice is nearly the same as in the prior guideline (See Table 2). All should be dosed 30–60 minutes prior to the procedure, but may be dosed up to 2 hours after the procedure if accidentally forgotten.

It is worthwhile to update your dental colleagues to avoid unnecessary phone calls and antibiotic prescriptions.

Table 1

Cardiac Conditions for Which Antibiotic Prophylaxis With Dental Procedures Is Reasonable¹

- Prosthetic cardiac valve or prosthetic material used for cardiac valve repair
- Previous infectious endocarditis
- Congenital heart disease (CHD)—ONLY those listed below
  - Unrepaired cyanotic CHD, including palliative shunts and conduits
  - Completely repaired CHD with prosthetic material or device, during the first 6 months after the procedure (endothelialization still occurring)
  - Repaired CHD with residual defects at the site or adjacent to the site of prosthetic patch or device (interfere with endothelialization)
- Cardiac transplant patients who develop cardiac valvulopathy

Table 2

Recommended Antibiotic Regimens for Dental Prophylaxis (Dose Once 30–60 Minutes Prior to Procedure)¹

<table>
<thead>
<tr>
<th>Situation</th>
<th>Antibiotic</th>
<th>Adult Dose</th>
<th>Pediatric Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral</td>
<td>Amoxicillin</td>
<td>2 gm</td>
<td>50 mg/kg</td>
</tr>
<tr>
<td>Unable to take oral medications</td>
<td>Ampicillin OR Cefazolin* or Ceftriaxone*</td>
<td>2 gm IM or IV</td>
<td>50 mg/kg IM or IV</td>
</tr>
<tr>
<td>Allergic to PCN or Ampicillin—oral</td>
<td>Cephalexin† OR Clindamycin OR Azithromycin or Clarithromycin</td>
<td>2 gm</td>
<td>50 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Cefazolin* or Ceftriaxone* OR Clindamycin</td>
<td>1 gm IM or IV</td>
<td>50 mg/kg IM or IV</td>
</tr>
<tr>
<td>Allergic to PCN or Ampicillin—unable to take oral medications</td>
<td></td>
<td>600 mg OR 500 mg</td>
<td>20 mg/kg OR 15 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Cefazolin* or Ceftriaxone* OR Clindamycin</td>
<td>1 gm IM or IV</td>
<td>50 mg/kg IM or IV</td>
</tr>
<tr>
<td></td>
<td></td>
<td>600 mg IM or IV</td>
<td>20 mg/kg IM or IV</td>
</tr>
</tbody>
</table>

* Do not use cephalosporins in a patient with a history of anaphylaxis, angioedema, or urticaria with penicillins or ampicillin.
† Other first- or second-generation oral cephalosporin may be substituted.
PCN—penicillin
IM—intramuscular

References


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Teaching Points—A 2-minute Mini-lecture

First Diagnosis of Hypertension

By Ann Rodden, DO, Medical University of South Carolina

Editor’s Note: The process of the 2-minute Mini-lecture is to get a commitment, probe for supporting evidence, reinforce what was right, correct any mistakes, and teach general rules. In this scenario, Dr Rodden (Dr R) works with a third-year student (MS3) who has seen a woman with elevated blood pressure.

Dr R: It looks like our first patient this morning is Mrs J. We have some time to talk because she isn’t back in the room yet. She is a very nice 38-year-old woman who came in for an annual physical about 3 months ago. At that time she had an elevated blood pressure. So she is here today to see how her blood pressure is doing.

MS3: Is she on any medication for her pressure?

Dr R: Very good. Lucky for Mrs J she has been healthy and has no medical conditions. You asked previously if I started medications with Mrs J. No, we discussed hypertension and what it means. She is worried about it because both her parents had hypertension, and her mother also had diabetes and high cholesterol. So at the last visit we talked about things she could do to decrease her blood pressure. Can you tell me a few of those?

MS3: A systolic of 140 or higher and a diastolic of 90 or higher.

Dr R: Are those numbers different for someone with diabetes or chronic kidney disease?

MS3: Yes, it goes lower to 130 and 80.

Dr R: It would be great if people could exercise every day. I always say: “30 minutes a day more days than not.” It doesn’t always have to be at the same time, so she can do 15 minutes during lunch and the other 15 minutes later in the day. How intense does it have to be?

MS3: Every day?

Dr R: And shoot for 50%–85% of that number? That’s a good guideline, but it’s a bit complicated. I tell folks: “As long as you feel like you are exerting yourself, it will be helpful. When you finish exercising, you should be able to say to yourself, ‘That was good exercise.’” When she and I talked 3 months ago we also determined her BMI (body mass index) and discussed that she is overweight. She wanted to work on her diet and exercise so that she can try to get to a normal weight besides also lower her blood pressure.

So, we have addressed diet and exercise, which we will go over with her again when we get in there. You also mentioned smoking, alcohol, and drugs of abuse. Why are these important?

MS3: The heart rate should go up to 220 minus the age?

Dr R: And shoot for 50%–85% of that number? That’s a good guideline, but it’s a bit complicated. I tell folks: “As long as you feel like you are exerting yourself, it will be helpful. When you finish exercising, you should be able to say to yourself, ‘That was good exercise.’” When she and I talked 3 months ago we also determined her BMI (body mass index) and discussed that she is overweight. She wanted to work on her diet and exercise so that she can try to get to a normal weight besides also lower her blood pressure.

So, we have addressed diet and exercise, which we will go over with her again when we get in there. You also mentioned smoking, alcohol, and drugs of abuse. Why are these important?

MS3: Smoking is known to cause an elevation in blood pressure. Alcohol is good in small amounts, but too much alcohol can be bad. And I was taught to always ask about drugs of abuse.

Dr R: Yes, smoking can affect the blood pressure and so can too much alcohol. One alcoholic beverage a day for women and two for men is fine, but more than that can affect the blood pressure. You are also correct about asking about illegal drugs. Cocaine and amphetamines can cause the blood pressure to go up but so can some over the counter...
medications and prescription medications so it is always good to get a thorough list of all medications and herbs that a person may be taking.

Now that we have that information and the vital signs from the nurse showing that she is still having elevated blood pressures, what are we going to do today for her?

MS3: Well, I guess the next step would be the physical exam.

Dr R: Good. What areas do we focus on in a patient with a new diagnosis of hypertension?

MS3: We should listen to her heart and lungs and check for edema in the legs.

Dr R: That’s a good place to start. Since high blood pressures affect the blood vessels in the body, where else would you like to examine?

MS3: Well, in the eyes would be one place. Also, the carotid arteries would be good to listen to.

Dr R: Very good. We listen to the carotids, abdomen, and femoral arteries to check for bruits. Examining the abdomen for enlarged kidneys or masses is also good along with a basic neurologic check and the pulses and edema check at the feet. The thyroid is also good to palpate since hyperthyroidism can cause hypertension. Also, we already talked a little about weight and her BMI.

After doing the exam, would you want to order any tests? I ask this knowing she came in fasting this morning for labs in case she was hypertensive.

MS3: I would assume then you are getting a fasting lipid panel and maybe a BMP to check electrolytes and diabetes. Since you mentioned the thyroid, if you have any concerns about hyperthyroidism, we could check a TSH.

Dr R: Good. So we are—in general—checking physical exam or lab findings to find causes: an abdominal bruit that might reveal renovascular hypertension or a large thyroid suggesting hyperthyroidism. And we’re looking for sequelae of hypertension. Looking for atherosclerosis—carotid bruits, for example.

You can also get a baseline EKG especially if we are going to start any treatments that could affect the heart rate. Other tests to consider would be a urinalysis to check for kidney disease along with the creatinine checked in the BMP. There are always other tests to do if you are concerned about another cause for the hypertension. Usually these tests will be done later if she continues to have problems with medications, or her history or physical makes you think she might have an underlying cause to her hypertension.

Looks like we are well on our way to discussing this with our patient and evaluating her hypertension. Let’s go in and see her.

Alec Chessman, MD, Medical University of South Carolina, Editor
Evidence-based Answer

Although the inflammatory markers procalcitonin (PCT) and C-reactive protein (CRP) are increased in acute pyelonephritis, it is unclear what cutoff values should be used clinically. In general terms, CRP testing is more sensitive, and PCT testing is more specific. (SOR B, based on diagnostic cohort studies with heterogeneous results.)

Delays in the test results may further limit the utility of these tests at some institutions. PCT and CRP have been proposed as serum markers for helping to differentiate acute pyelonephritis (APN) from lower urinary tract infection (UTI) in children. Four cohort studies of these serum markers were identified that used the gold standard of reversible changes on renal scintigraphy to diagnose pyelonephritis. The key outcomes of these studies are given in Tables 1 and 2.

In the first study, which included 60 patients, 37 were found to have APN, and 23 had lower UTI. PCT averaged 0.38 μg/L in lower UTI and 5.37 μg/L in APN (P<.0001). The CRP in lower UTI averaged 0.13 μg/L and 3.41 μg/L in APN (P<.0001). The CRP in lower UTI averaged 74.5 mg/L and 120 mg/L in APN (P<.012).

The third study involved 100 patients, 53 with APN and 47 with lower UTI. The PCT mean in lower UTI averaged 0.44 μg/L versus 4.48 μg/L in APN (P<.0001). The CRP mean in lower UTI averaged 36.4 mg/L versus 106 mg/L in APN (P<.0001). This study also looked at different cutoff values for PCT (≥0.5, ≥0.8, ≥1 ng/mL). Based on sensitivity, specificity, negative predictive value, and positive predictive value, they determined the cutoff value of 0.8 ng/mL was most accurate.

A slightly different type of study initially categorized patients clinically into APN or lower UTI. A dimercaptosuccinic acid (DMSA) renal scan was performed 6 months later on all patients to assess for renal scarring (suggesting local parenchymal infection). Of the 77 patients enrolled, 58 met the clinical criteria for the APN. After DMSA, only 13 of the 58 patients with clinically diagnosed APN (22%) had renal damage (confirming the clinical diagnosis), and 45 (78%) lacked renal damage (and likely had a lower UTI).

Patients with a clinical diagnosis of APN had a median PCT level of 1.16 μg/L and a median CRP level of 97.0 mg/L. Patients with DMSA-confirmed APN had a median PCT level of 9.28 μg/L and a median CRP level of 162.2 mg/L. The differences in the PCT and CRP levels between the groups were statistically significant (P<.0002 and P<.026, respectively).


SOR—strength of recommendation
LOE—level of evidence

Jon O. Neher, MD, University of Washington, Editor

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POEMs for the Teaching Physician

Pedometer Use Increases Physical Activity and May Promote Weight Loss

Clinical Question: Should clinicians recommend the use of pedometers for their adult patients to improve health outcomes?

Setting: Various (meta-analysis)

Study Design: Meta-analysis (other)

Synopsis: These investigators thoroughly searched for studies that evaluated the effect of pedometer use. Their search included MEDLINE, EMBASE, the Cochrane Library, bibliographies of retrieved articles, and conference abstracts for English language-only studies. Both randomized and observational trials were included. Two authors independently searched for and critiqued all studies, and discrepancies were resolved by consensus. Heterogeneity assessment occurred using sensitivity analysis. Funnel plots and analyses of the number of missing studies required to change the results determined the potential for publication bias. From an initial identification of 2,246 articles, only 26 studies (evaluating 2,767 participants) met eligibility criteria, including eight methodologically acceptable randomized controlled trials (RCTs). The remainder were classified as observational studies. The mean age of participants was 49 years. Separate analysis of both the RCTs and observational trials found a statistically significant increase in physical activity (2,000 to 2,400 steps per day) in the pedometer use group. Patients setting a personal step goal and using a step diary were most likely to increase their physical activity. Participants using pedometers significantly decreased their baseline body mass index by an average of 0.38 units. Although average blood pressure levels were minimally decreased in the intervention group (3.8 mm Hg systolic; 0.3 mm Hg diastolic), there were no significant improvements in lipid or glucose levels compared with the control group.

Bottom Line: Pedometer use is associated with increased physical activity (average increase=2,200 steps daily), reduced blood pressure, and minimal weight loss (0.39 reduction in baseline body mass index). Patients setting a personal step goal monitored with a daily diary were most likely to significantly increase activity. Current studies are short term and do not evaluate true patient-oriented outcomes. (LOE=1a-)


Alpha-blocker or Nifedipine May Help Pass Kidney Stones

Clinical Question: Can drug treatment improve passage of ureteral stones?

Setting: Various (meta-analysis)

Study Design: Meta-analysis (randomized controlled trials)

Synopsis: The researchers conducting this study combined the results of small studies evaluating the effectiveness of alpha-blockers, a calcium channel blocker, or both, to increase the passage of ureteral calculi. The meta-analysis was well done. Two authors independently searched several databases, including the Cochrane database, to find randomized studies. They also conducted a hand search of urologic journals and conference proceedings. Two authors also independently abstracted data. They identified 22 studies. Only one study was considered to be of good quality with a Jadad score of 3 (out of a possible 5), with all the rest scoring 1 or 2. But all one of the studies was unblinded, and the researchers did not report on whether allocation was concealed in the studies. There was mild heterogeneity found among the alpha-blocker studies, as well as evidence of publication bias. Alpha-blockers, primarily tamsulosin, were studied in 16 trials enrolling 1,235 men. Nine trials evaluated the time to stone expulsion in patients with stones of 3 mm to 18 mm in size and located in the distal portion of the ureter, with a 2-day to 6-day average improvement in time to stone passage. The calcium channel blocker was studied in nine trials of 868 patients with an average stone size of greater than 5 mm located in all aspects of the ureter. The average reduction in time to stone expulsion was not reported, though stone passage was more likely, on average, with treatment (relative risk=1.50; 95% CI=1.34–1.68) over the various periods of follow-up.

Bottom Line: This meta-analysis of low-quality studies shows that ureteral stone passage can be enhanced by treating patients with an alpha-blocker such as tamsulosin (Flomax) or the calcium channel blocker nifedipine (Procardia). Better studies may refute these findings, but for now either approach is an option. (LOE=1a-)


LOE—level of evidence. This is on a scale of 1a (best) to 5 (worst). 1b for an article about treatment is a well-designed randomized controlled trial with a narrow confidence interval.

Mark Ebell, MD, MS, Michigan State University, Editor