

ANTIBIOTIC STEWARDSHIP PROGRAM

DENTAL UPDATE

Topic: Antibiotic Prescribing Optimization January 2021

Wisconsin policy makers, oral and medical health care team members, and the public are not immune to the paramount concern for antibiotic safety, quality, and care. While antibiotics save lives and are critical tools for treating a number of common and more serious infections, including those that can lead to sepsis and antibiotic resistance, scarce antibiotic choices for multidrug-resistant organisms are an urgent worldwide public health problem.

Purpose

This collaboration will be led by Dr. Barry Fox, the antibiotic stewardship director within the Wisconsin Department of Health Services (DHS), Division of Public Health, which receives activity support from the CDC. The purpose of the Wisconsin Oral Health Antibiotic Stewardship Program (WOHASP) is to offer education and guidance to increase awareness of evidence-based antibiotic prescribing and use.

Education and Awareness

Improving antibiotic prescribing and use is critical to effectively treating current and future bacterial infections while protecting patients from antibiotic harm. Education and awareness for all stakeholders is essential to stem antibiotic misuse harms and the emergence and spread of antibiotic resistance.

Communication

With the goal of communicating on a quarterly basis, WOHASP will provide clinical observations, peer-reviewed articles, and national organization consensus opinions to support the development, implementation, and integration of evidence-based antibiotic advisory guidance.

Topic 1: Antibiotic Prescribing Optimization

The general guiding principle for prescribing optimization is to have short, effective, narrow-spectrum beta-lactam antibiotics when antibiotics are indicated.

SPECIFIC SITUATIONS AND CONDITIONS

Deeper oral infections

Oral health care should be considered as a first line treatment for periapical or pulpal pathology, if possible and appropriate (4). Prolonged antibiotic therapy is generally not indicated.

Heart conditions

American Heart Association guidelines for prophylaxis have not significantly changed since 2007 (1). Note that patients with pacemakers and/or defibrillators are not considered to have a “heart condition” requiring routine antibiotic prophylaxis (2). Serious adverse events have been associated with inappropriate prophylaxis (3).

Allergies

Beta-lactam allergies should be thoroughly investigated before prescribing clindamycin. Should a patient report a beta-lactam allergy not associated with anaphylaxis, angioedema, or hives, consideration should be given to prescribing cephalexin over clindamycin for prophylaxis.

Two educational videos, one intended for oral health professionals and one for patients, on debunking penicillin allergy myths are available on the [Wisconsin Department of Health Services, Antimicrobial Stewardship webpage](#), under the “Health Professionals” and “Patients” tabs.

ANTIBIOTIC CONSIDERATIONS

Antibiotic classes

Clindamycin is no longer the preferred choice for patients with penicillin allergies or if a “stronger” antibiotic is indicated. Aside from short-term gastrointestinal side effects from clindamycin, the risk of *Clostridioides difficile* infection is deemed to be too great for routine use of clindamycin (5). Select patients with severe penicillin allergies may be considered for clindamycin therapy.

An amoxicillin and metronidazole combination is an acceptable consideration if treatment requires enhanced anaerobic activity. The risk of *Clostridioides difficile* infection is reduced with this choice of antibiotics. However, the use of metronidazole may cause some patients to experience nausea. Augmentin (amoxicillin/clavulanate) is a suitable alternative to the amoxicillin/metronidazole combination for enhanced anaerobic activity (6).

Pharmacokinetic (PK) and pharmacodynamic principles (6)

Pharmacokinetic and pharmacodynamics principles of the beta-lactam/penicillin class of antibiotics should also be considered. The half-life of penicillin is a short 0.5-0.7 hours, and for amoxicillin it is 1-1.3 hours (7). Also, a minimum of 40% of time above the minimum inhibitory concentration (MIC) of germs is the guiding principle for effective therapy (8). Hence, prescriptions for penicillin and cephalosporin class antibiotics should generally include dosing every eight hours, in spite of any compliance concerns. Every 12-hour antibiotic dosing is less desirable to achieve these goals.

Treatment for Group A strep follows a different PK paradigm and should not be considered a valid model in dentistry.

For more serious infections, and for patients with BMI greater than 25 or weight greater than 230 pounds, higher doses of amoxicillin (i.e., 1 gram orally three times daily), may be considered without any significant risk of increased gastrointestinal side effects. Combinations of amoxicillin 500mg and Augmentin 500mg three times daily may also be reasonable, in spite of the need for two generic prescriptions. Augmentin XR (extended release, 2 grams two times daily) may be considered as well, but may not necessarily be covered under insurance plans, or may be covered with a higher co-payment.

Duration of antibiotic therapy

Duration of antibiotic therapy should generally adhere with the length of time needed to accomplish the clinical goal. For pre-procedure prophylaxis (but NOT post-procedure), a regimen lasting 24 hours is appropriate. Prescriptions that are not for prophylaxis purposes should generally be no longer than 5-7 days, with 14 days as the upper limit for any prescribing (8).

A general reference on [best practices in dentistry prescribing](#) is available from CDC.

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Antibiotic Stewardship Guidance Limitations: *The Wisconsin Antibiotic Stewardship Program provides materials and guidance with the understanding and recognition that information on antibiotic use is continuously evolving. Consensus statements, peer-reviewed articles, and evidence-based guidelines also have limitations. Prior to the implementation of a guideline, stakeholders, oral health providers, and health care organizations should conduct a review per their policies, procedures, and quality assurance functions to ensure guidelines comply with local, regional, and national requirements for patient care, safety, and quality.*