



<b>Track: Hospital Medicine</b>		
<b>Body System: Integumentary</b>		
<b>Session Topic: Skin Infections</b>		
Educational Format		Faculty Expertise Required
<b>REQUIRED</b>	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
<b>OPTIONAL</b>	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
Professional Practice Gap	Learning Objective(s) that will close the gap and meet the need	Outcome Being Measured
<ul style="list-style-type: none"> <li>Physicians have knowledge gaps with regard to diagnosing and evaluating common skin diseases (e.g. acne, dermatitis, rosacea).</li> <li>Primary care physicians often receive inadequate dermatology training in medical school.</li> <li>Patients with skin disease often have misconceptions about appropriate skin care.</li> <li>Physicians have knowledge gaps with regard to appropriate coding/billing for skin procedures.</li> <li>Physicians have knowledge gaps with regard to selecting appropriate treatment therapies for skin diseases.</li> </ul>	<ol style="list-style-type: none"> <li>Diagnose the most common bacterial skin infections and the likely pathogens.</li> <li>Develop treatment plans for the common pathogens, with emphasis on appropriate antibiotics for MRSA infections.</li> <li>Diagnose common fungal/yeast infections such as tinea pedis, tinea versicolor, tinea corporis, tinea capitis, and onychomycosis.</li> <li>Confirm fungal infection by KOH preparation, culture, or biopsy prior to treatment.</li> <li>Describe the appropriate treatment for the fungal/yeast infection--systemic or topical.</li> <li>Discuss the cutaneous manifestations of common viral infections and develop treatment options.</li> <li>Explain preventive measures for patients or hospital staff to take to prevent further spread of common viral skin infections.</li> </ol>	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.
<b>ACGME Core Competencies Addressed (select all that apply)</b>		
X	Medical Knowledge	Patient Care



	Interpersonal and Communication Skills		Practice-Based Learning and Improvement
	Professionalism	X	Systems-Based Practice
<b>Faculty Instructional Goals</b>			
<p><b>*NOTE TO FACULTY - This topic is part of the Hospital Medicine Track. Associated topics include: Atrial Fibrillation; Anticoagulation; Sepsis; &amp; Clostridium Difficile.</b></p> <p><b>Expectation:</b></p> <ol style="list-style-type: none"> <li><b>1. Include an appropriate focus on inpatient care (up to 100%)</b></li> <li><b>2. Collaborate with faculty from associated topics (above)</b></li> </ol>			
<p>Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.</p> <ul style="list-style-type: none"> <li>• Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy &amp; reference citations</li> <li>• Facilitate learner engagement during the session</li> <li>• Address related practice barriers to foster optimal patient management</li> <li>• Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the <u>References</u> section below are a good place to start             <ul style="list-style-type: none"> <li>○ Visit <a href="http://www.aafp.org/journals">http://www.aafp.org/journals</a> for additional resources</li> <li>○ Visit <a href="http://familydoctor.org">http://familydoctor.org</a> for patient education and resources</li> </ul> </li> <li>• Provide recommendations for diagnosing the most common bacterial skin infections and the likely pathogens</li> <li>• Provide recommendations for developing treatment plans for the common pathogens, with emphasis on appropriate antibiotics for MRSA infections.</li> <li>• Diagnose common fungal/yeast infections such as tinea pedis, tinea versicolor, tinea corporis, tinea capitis, and onychomycosis.</li> <li>• Provide recommendations for confirming fungal infection by KOH preparation, culture, or biopsy prior to treatment.</li> <li>• Provide recommendations for the appropriate treatment for the fungal/yeast infection--systemic or topical.</li> <li>• Provide recommendations for identifying cutaneous manifestations of common viral infections and develop treatment options.</li> <li>• Provide recommendations for effective preventive measures for patients to take to prevent further spread of common viral skin infections.</li> </ul>			

**Needs Assessment**

Skin problems and diseases have become a growing reason for which patients seek treatment; in 2010, diagnostic screening of the skin occurred, or were ordered, in over 167 million office visits; and among those, benign neoplasm was the primary diagnosis is over 11 million of those office visits.<sup>1</sup>



### Bacterial

Resistance to antimicrobial therapy has caused a surge in multidrug resistant organisms (MDROs), such as methicillin-resistant staphylococcus aureus (MRSA) which can be acquired both in community and healthcare settings. MDROs have emerged over the past few decades as a significant public health threat because they are widespread and have clinical manifestations that are similar to infections caused by susceptible pathogens, but options for treating patients with such infections are extremely limited.<sup>2-4</sup> Between 1998 and 2004, the number of drug resistant pathogens increased from 17% to nearly 35%.<sup>5</sup> Patient morbidity and mortality rates are higher when compared to nonresistant infections with a 3-fold increase in mortality, associated 5.5 additional days of hospitalization, and \$24,113 of additional charges.<sup>6</sup>

The Centers for Disease Control and Prevention (CDC) reports that Americans make approximately 12 million office visits to physicians each year with symptoms that are suspicious of staph or MRSA infections. It is imperative that family physicians consider a MRSA diagnosis in all patients who present with skin and soft tissue infections in order to control outbreaks and minimize complications to the patient. Recent availability of new diagnostic testing and therapeutic options may help in providing earlier diagnosis with increase in treatment efficacy.<sup>7</sup> While consideration of MRSA is crucial, inappropriate antibiotic prescription leads to continued and worsening issues with resistance. Proper pathogen and sensitivity identification is imperative when determining appropriate treatment strategy.

### Fungal

Fungal infection is a common clinical problem.<sup>8</sup> Fungal infections of the skin, hair and nails affect more than 20-25% of the people worldwide, and are considered a public health problem.<sup>9</sup> These infections tend to cause inflammation and associated signs and symptoms, such as erythema, burning and pruritis.<sup>10</sup>

The prevalence of fungal infections of the skin has increased rapidly and affects approximately 40 million people worldwide.<sup>11</sup> The gold standard for diagnosing fungal skin infections is microscopy and fungal culture, and obtaining a definite diagnosis is desirable before commencing treatment, especially with oral therapy (and a current recommendation of the Choosing Wisely® campaign).<sup>12,13</sup> Rapid confirmation of the diagnosis is desirable because it allows the clinician to initiate appropriate therapy without delay. Use of potassium hydroxide (KOH) wet-mount is recommended as a rapid, inexpensive method.<sup>12</sup>

### Viral

A wide variety of viral skin infections may be seen in the primary care physician's office, such as parvovirus B19, herpes simplex (HSV), herpes zoster, human papilloma virus (HPV), molluscum contagiosum virus (MCV), cytomegalovirus (CMV), and Human Immunodeficiency Virus (HIV).<sup>14-16</sup> Family physicians are pivotal in the timely diagnosis of these infections with regard to improving disease prognosis and preventing further disease transmission.<sup>15</sup>

## **Practice Gaps**

### Bacterial



Successful initial treatment of skin infections is vital, especially with complicated infections. Initial treatment failure is associated with significantly worse clinical outcomes, longer hospital stays, and higher hospital charges.<sup>2</sup> However, the data show that prescription for anti-CA-MRSA agents for skin infections increased significantly, and were overused.<sup>3</sup> In 2014, the Infectious Diseases Society of America (IDSA) published guidelines for the diagnosis and appropriate treatment of skin and soft tissue infections, including specific guidelines for the treatment of MRSA.<sup>6,17</sup>

### Fungal

Accurate diagnosis can be challenging as several disorders can mimic fungal infections.<sup>12,18</sup> These infections can also be difficult to treat. In one survey, fungal infection was the skin condition most likely to be misdiagnosed by primary care physicians. Family physicians should confirm suspected fungal infections, in particular tinea capitis and onychomycosis with a potassium hydroxide preparation or culture.

Treatment of fungal disease can include a variety of topical and systemic antifungal agents with differing formulations, tolerability, adverse effect profiles and spectrum of activity.<sup>18,19</sup> Topical delivery can be affected by impaired drug delivery across the skin, resulting in insufficient therapeutic effect, as well as local and systemic side effects.<sup>11</sup> Additional barriers to successful treatment include nonadherence due to the prolonged treatment period, incorrect diagnosis, or advanced disease due to late diagnosis.<sup>20</sup>

These varied treatments are not interchangeable. There are specific recommendations for treatment based upon the actual type of fungal infection. Knowledge of the currently available antifungal agents, diagnostic methods and evidence based treatment recommendations can help family physicians optimally manage skin and nail fungal infections.

### Viral

Skin and soft tissue infections rank among the most frequent infections worldwide. Infectious skin diseases pose considerable treatment challenges, especially given the recent appearance of several highly virulent pathogens as well as the rising number of immunocompromised patients in the United States. Presentations can vary and even in some cases appear as alternate malignant and benign skin conditions, making clinical diagnosis challenging.<sup>21-23</sup> Family physicians require updates on the most prevalent viral infections, the therapeutic needs for patients with viral skin infections, and the current, ongoing research on disease surveillance, existing treatments and drug development.<sup>24-26</sup>

Physicians may improve their care of patients with skin infections by engaging in continuing medical education that provides practical integration of current evidence-based guidelines and recommendations into their standards of care, including, but not limited to the following:

#### Prevention of Health Care-Associated Infections<sup>27</sup>

- Use routine contact precautions for patients colonized or infected with multidrug-resistant organisms.
- Bathe patients in intensive care units daily with chlorhexidine.



- Administer decolonization therapy with mupirocin (Bactroban) to colonized patients if infection rates do not decrease despite basic prevention measures.
- Perform active surveillance cultures for MRSA and multidrug-resistant organisms if infection rates do not decrease despite basic prevention measures.
- Implement a systematic approach to reduce inappropriate antibiotic prescribing.

#### Skin and Soft Tissue Infections<sup>28</sup>

- Blood cultures seldom change treatment and are not required in healthy immunocompetent patients with SSTIs.
- Uncomplicated purulent SSTIs in easily accessible areas without overlying cellulitis can be treated with incision and drainage only; antibiotic therapy does not improve outcomes.
- Inpatient treatment is recommended for patients with uncontrolled SSTIs despite adequate oral antibiotic therapy; those who cannot tolerate oral antibiotics; those who require surgery; those with initial severe or complicated SSTIs; and those with underlying unstable comorbid illnesses or signs of systemic sepsis.
- There is no evidence that any pathogen-sensitive antibiotic is superior to another in the treatment of MRSA SSTIs.
- Treatment of necrotizing fasciitis involves early recognition and surgical debridement of necrotic tissue, combined with high-dose broad-spectrum intravenous antibiotics.

#### Skin and Soft Tissue Infections in Immunocompetent Patients<sup>29</sup>

- Wound and blood cultures are not necessary in patients with uncomplicated SSTIs because results rarely alter management decisions.
- Retrospective analyses
- Incision and drainage alone is often curative for uncomplicated SSTIs with abscesses measuring less than 5 cm in diameter.
- Retrospective chart review; randomized, double-blind trials
- When surgical drainage of SSTIs is performed, there is no difference in clinical outcomes between wound irrigation with tap water versus sterile water.
- Prospective trials from urban pediatric emergency departments
- When initiating empiric antimicrobial therapy for uncomplicated SSTIs, physicians should consider local prevalence of pathogens, including MRSA, and resistance patterns.
- Expert opinion
- Eradication of MRSA carrier state is not associated with reduced incidence of clinical MRSA infection.

#### Impetigo: Diagnosis and Treatment<sup>30,31</sup>

- Although impetigo is often self-limited, antibiotics are commonly prescribed to prevent complications and spread of the infection.
- Topical antibiotics are more effective than placebo and preferable to oral antibiotics for limited impetigo.
- Oral penicillin should not be used for impetigo because it is less effective than other antibiotics.
- Oral erythromycin and macrolides should not be used to treat impetigo because of emerging drug resistance.



- There is insufficient evidence to recommend topical disinfectants for the treatment of impetigo.
- There is insufficient evidence to recommend (or dismiss) popular herbal treatments for impetigo.

#### Diagnosis and Management of Tinea Infections<sup>12,30</sup>

- Tinea corporis, tinea cruris, and tinea pedis can often be diagnosed based on appearance, but a potassium hydroxide preparation or culture should be performed when the appearance is atypical.
- Acceptable treatments for tinea capitis, with shorter treatment courses than griseofulvin, include terbinafine (Lamisil) and fluconazole (Diflucan).
- The diagnosis of onychomycosis should generally be confirmed with a test such as potassium hydroxide preparation, culture, or periodic acid–Schiff stain before initiating treatment.

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.

#### Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- Prevention of health care-associated infections<sup>27</sup>
- Skin and Soft Tissue Infections<sup>28</sup>
- Skin and soft tissue infections in immunocompetent patients<sup>29</sup>
- Common Skin Rashes in Children<sup>30</sup>
- Impetigo: diagnosis and treatment<sup>31</sup>
- Diagnosis and management of tinea infections<sup>12</sup>
- Practice guidelines for the diagnosis and management of skin and soft tissue infections<sup>17</sup>
- Fungal Toenail Infections<sup>18</sup>
- Onychomycosis: Current trends in diagnosis and treatment<sup>20</sup>
- Familydoctor.org - Methicillin-resistant Staphylococcus aureus (MRSA) (patient education)<sup>32</sup>
- Familydoctor.org – Ringworm (patient education)<sup>33</sup>
- Familydoctor.org – Nail Fungal Infections (patient education)<sup>34</sup>

#### References



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