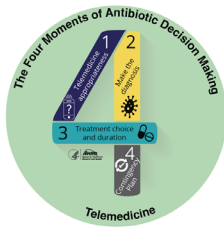


Best Practices in Managing Cellulitis Over Telemedicine

Slide Title and Commentary	Slide Number and Slide
Best Practices in Cellulitis Over Telemedicine SAY: Welcome to the presentation titled, “Best Practices in Managing Cellulitis Over Telemedicine.”	Slide 1 AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Best Practices in Managing Cellulitis Over Telemedicine    AHRQ Pub. No. 2027-0021 October 2008
Objectives SAY: This presentation will use a clinical case–based format to discuss the approach to managing cellulitis over telemedicine. By the end of this presentation, participants will be able to— • Describe the approach to diagnose cellulitis via telemedicine and determine when an in-person visit is more appropriate • Understand how to distinguish cellulitis from other conditions that may mimic cellulitis • Identify effective antibiotic regimens for cellulitis that minimize adverse events • Discuss the expected time course of a case of cellulitis and when patients should return for followup	Slide 2 Objectives By the end of this presentation, participants will be able to— • Describe the approach to diagnose cellulitis via telemedicine and determine when an in-person visit is more appropriate • Understand how to distinguish cellulitis from other conditions that may mimic cellulitis • Identify effective antibiotic regimens for cellulitis that minimize adverse events • Discuss the expected time course of a case of cellulitis and when patients should return for followup AHRQ Safety Program for Telemedicine: Improving Antibiotic Use    Cellulitis 2

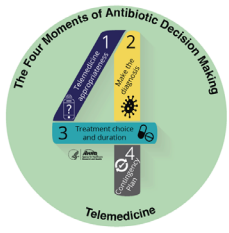
Slide Title and Commentary	Slide Number and Slide
The Four Moments of Antibiotic Decision Making SAY: This presentation will review a clinical case using the Four Moments of Antibiotic Decision Making framework. Briefly, this framework consists of the following moments: Moment 1: Is my patient an appropriate candidate for a telemedicine visit? Moment 2: Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed? Moment 3: If antibiotics are indicated, what is the narrowest, safest, and shortest regimen I can prescribe? Moment 4: What symptomatic relief should I offer or prescribe to my patient? What should I tell my patient about the expected course and the followup plan?	Slide 3 The Four Moments of Antibiotic Decision Making  1. Is my patient an appropriate candidate for a telemedicine visit? 2. Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed? 3. If antibiotics are indicated, what is the narrowest, safest, and shortest regimen I can prescribe? 4. What symptomatic relief should I offer or prescribe to my patient? What should I tell my patient about the expected course and the followup plan? AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 3
Case Presentation SAY: The presentation begins with a clinical case. The electronic triage form indicates that the next patient you are seeing is a 46-year-old male named Luca who is presenting with a red, warm, painful area at his left calf.	Slide 4 Case Presentation A 46-year-old man named Luca presents with a red, warm, painful area on his left calf  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 4

Slide Title and Commentary	Slide Number and Slide
Moment 1: Obtaining the History (Part 1) SAY: Regarding Moment 1, a history and physical exam is necessary to decide whether it is safe to proceed with a telemedicine visit. You ask Luca additional questions. When did he first notice the lesion? How has it changed in appearance from when it first started? Has there been any drainage from the site? How quickly has the redness been spreading? Have any other body sites been affected? Has he been having fevers, chills, or feeling generally unwell? Does he recall any trauma to the site, insect bites, or animal bites? Given the lesion is on his lower extremity, has he been able to walk on the affected leg?	Slide 5 Moment 1: Obtaining the History (Part 1) • When did he first notice the lesion? • How has it changed in appearance from when it first started? • Has there been any drainage from the site? • How quickly has the redness been spreading? • Have any other body sites been affected? • Has he been having fevers or chills, or feeling generally unwell? • Does he recall any trauma to the site, insect bites, or animal bites? • Has he been able to walk on the affected leg?  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 5
Moment 1: Obtaining the History (Part 2) SAY: You continue asking for more details. Has he been on a long flight in the last few days or experienced other more than typical sedentary activity? Has anything made the lesion better or worse? Also, ask about any general medical conditions. Does he have any underlying skin conditions like eczema, psoriasis, or athlete's foot? Has he had issues with venous insufficiency, lymphedema, diabetes, or obesity? Has he had any recent surgeries? Does he use any intravenous drugs?	Slide 6 Moment 1: Obtaining the History (Part 2) • Has he been on a long flight in the last few days or experienced other more than typical sedentary activity? • Has anything made the lesion better or worse? • Does he have any underlying skin conditions like eczema, psoriasis, athlete's foot? • Has he had issues with venous insufficiency, lymphedema, diabetes, or obesity? • Has he had any recent surgeries? • Does he use any intravenous drugs?  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 6

Slide Title and Commentary	Slide Number and Slide
Moment 1: Patient's History SAY: Luca states that he is in generally good health. He had left knee replacement surgery 2 years ago from which he recovered well and is now back to being reasonably active. He has had no other major medical or surgical conditions. He first noticed the lesion on his left calf about 2 days ago. It started off about the size of a quarter and in the past two days has doubled in size. Luca has not noticed any lesions anywhere else. He says the affected area feels warm and he may have a fever but he otherwise feels generally OK and is able to walk without any difficulty. He recalls accidentally bumping his left thigh against his bed frame 2 days before. It bled a little and then he had forgotten about it. But over the past day, he noticed it became progressively red and tender. He has not noticed any drainage. Luca has been putting a warm compress to the site, which has made it feel a little better. You confirm that Luca is able to eat and function relatively normally. As you notice that Luca has a normal mental status and is not ill appearing, it is appropriate to proceed with a physical examination to help you decide if it is safe to manage Luca via telemedicine.	Slide 7 Moment 1: Patient's History • Previously healthy • Noticed lesion on left calf 2 days ago ◦ Began size of a quarter; in the past 2 days it has doubled in size ◦ No other lesions • Bumped left thigh against his bed frame 2 days ago and it bled a little ◦ Became progressively red and tender without drainage over past day • Unsure if he has a fever • Able to walk without difficulty • Able to eat and function normally • Normal mental status  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 7

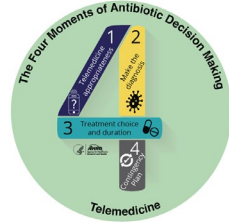
Slide Title and Commentary	Slide Number and Slide
Moment 1: Virtual Physical Examination SAY: You ask Luca if he has a thermometer. He does and states his temperature is 100.9 degrees Fahrenheit, indicating he has a fever. You ask him to check his heart rate by placing the tips of his index and middle fingers on the inside of his wrist, just below his thumb. You ask him to press lightly until he feels his pulse and then count the beats for 15 seconds. Multiply that number by four to obtain beats per minute. His pulse is slightly fast at 96 beats per minute. You ask Luca to bring the camera as close to his left leg as necessary to enable you to view the left leg from the knee to the ankle with the possibility of zooming in and out as needed. If he was wearing pants, you should give him the opportunity to change to shorts if he cannot pull his pant leg up. Similarly, if he has any bandages or dressing covering the site, you should ask him to remove them. You confirm that it is an erythematous lesion. You ask him to press on it, and he confirms it hurts. You ask him if the affected area of the left leg feels warmer than the right leg. He also states he does not feel any obvious fluid collection under the red area. You also do not observe any drainage. You notice there are no bullae (which are fluid-filled blisters) or areas of necrosis (which appears as very darkened skin). You inspect his knee and ankle, the joints proximal and distal to the lesion. They do not appear swollen, and he is able to move them without difficulty. You ask to inspect his feet and confirm that he does not have any associated tinea pedis (also known as athlete's foot), which is a superficial fungal infection of the foot that generally presents as a scaling, maceration, and fissuring between the toes. It generally is associated with pruritis and malodor. The risk of tinea pedis increases with several noninfectious conditions that can cause pain and swelling in the calf. Tinea pedis is treated by avoiding occlusive footwear and applying topical over-the-counter antifungal creams. Ask Luca to take a pen or marker to outline the area of cellulitis so that he can keep track of its size over the upcoming hours and days.	Slide 8 Moment 1: Virtual Physical Examination • Temperature: 100.9 degrees Fahrenheit • Heart rate: 96 beats per minute • Erythematous lesion on left calf without drainage • No bullae or necrosis • Knee and ankle not swollen and no limitations in movement • No associated tinea pedis  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 8

Slide Title and Commentary	Slide Number and Slide
Considerations For In-Person Visit SAY: At this point, it is reasonable to diagnose Luca with cellulitis and treat him with antibiotics in the absence of any diagnostic testing. Given that it has not spread very much, there seems to be a low likelihood of rapid progression. Although he has a fever and mild tachycardia, he does not appear systemically ill. Patients with cellulitis present with redness, warmth, tenderness, and swelling of the skin that is of relatively sudden onset. Cellulitis is almost always unilateral. Many patients will have fever, although the proportion varies among studies from 20 to 70 percent. You decide that it seems appropriate to manage Luca via telemedicine. There are several instances when it would have been more appropriate to refer Luca for an in-person visit. These include the following: If Luca was ill appearing, seemed confused, described the affected area as rapidly spreading, had necrosis associated with the cellulitis or bullae, then an in-person visit—preferably to an emergency department—should be recommended. Additionally, if a previous course of antibiotic therapy did not work or he is presenting with a recurrent infection, then an in-person referral would be warranted. If the cellulitis involved very sensitive areas such as the face or groin, that would be another indication for an in-person visit. There are also underlying patient conditions that would make an in-person visit preferable to determine if a diagnostic evaluation and possible inpatient admission might be warranted. These include if Luca had hardware or had a foreign body at the affected site, if he had uncontrolled diabetes, severe hepatic or renal disease, or underlying immune compromise—for example because of immunosuppressive medications for an autoimmune condition, solid organ transplant, or malignancy.	Slide 9 Considerations for In-Person Visit • Ill appearing and/or confused • Rapidly spreading with or without necrosis or bullae • Previously failed a course of antibiotic therapy or presenting with recurrent infection • Involvement of face or groin • Indwelling hardware or foreign body involvement • Uncontrolled diabetes • Severe hepatic or renal disease • Underlying immune compromise (e.g., immunosuppressive medications for an autoimmune condition, solid organ transplant, or malignancy) AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 9

Slide Title and Commentary	Slide Number and Slide
Moment 2: Need for Antibiotics SAY: Let's move on to Moment 2 and discuss the need for antibiotics.	Slide 10 Moment 2: Need for Antibiotics  1. Is my patient an appropriate candidate for a telemedicine visit? 2. Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed? AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 10
Non-Purulent Versus Purulent Cellulitis SAY: Moment 2 states, “Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed?” Cellulitis can be nonpurulent, meaning there is no pus draining from the site, or purulent, meaning there is pus draining from the site. In Luca’s case, he appears to have nonpurulent cellulitis. There is no need to obtain cultures, and you can proceed with an empiric antibiotic course as we will discuss in Moment 3. For purulent cellulitis—meaning there is pus draining from the site—cultures are not essential and it is OK to proceed with antibiotic therapy, assuming the conditions just discussed for which in-person visits are more appropriate are not present. If seeing a patient in person, if purulent material can be expressed from the cellulitis and you prefer to send a culture, it is best to send the pus itself in a sterile container and not a swab of the pus to optimize the likelihood of recovering a microorganism. Of note, occasionally a spider bite can look like the image on the right. However, purulence drainage would not be expected. When observing a case of cellulitis, you may not always be able to visualize active purulence (which is the case with the image on the right), but it is important to ask about this when eliciting the patient’s symptoms. Before moving on to Moment 3, there are several mimics of cellulitis worth considering whenever a patient presents with possible cellulitis for which antibiotics would not be indicated. These will be reviewed on the next few slides.	Slide 11 Non-Purulent Versus Purulent Cellulitis Nonpurulent cellulitis  Purulent cellulitis  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 11

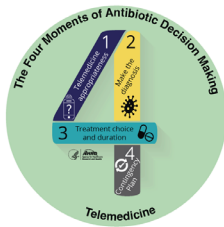
Slide Title and Commentary	Slide Number and Slide
Cellulitis Mimics – Venous Stasis Dermatitis SAY: Venous stasis dermatitis is an inflammatory dermatosis of the lower extremities. It most commonly occurs with people who have standing occupations, are obese, have underlying heart failure, or previous deep vein thromboses. Luca does not have any of these risk factors. Venous stasis dermatitis can be distinguished from cellulitis in several ways. It is often bilateral; usually present for a long period of time; and associated with chronic skin hyperpigmentation, itchiness, scaling, pitting edema, and/or serous drainage. Patients have less pain with venous stasis dermatitis than with cellulitis. It is not associated with a fever. Venous stasis dermatitis can improve with elevation of the extremity, compression stockings, and topical steroids.	Slide 12 Cellulitis Mimics – Venous Stasis Dermatitis¹⁻² • Inflammatory dermatosis of the lower extremities • Most commonly occurs with standing occupations, obesity, underlying heart failure, or previous deep vein thrombosis • Usually present for a long period of time • Associated with chronic skin hyperpigmentation, itchiness, scaling, pitting edema, and/or serous drainage • Less pain than with cellulitis • Not associated with fevers • Can improve with elevation of the extremity, compression stockings, and topical steroids  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 12
Cellulitis Mimics – Lymphedema SAY: Lymphedema results from disruption of lymphatic drainage. It can be congenital but is usually related to obesity or lymph node dissection (for example, as part of malignancy management). It is usually unilateral (distal to the lymphatic disruption) and associated with aching pain and diffuse nontender erythema that improves with elevation. There is minimal associated warmth. Fever is not typical.	Slide 13 Cellulitis Mimics – Lymphedema¹⁻² • Disruption of lymphatic drainage • Usually related to obesity or lymph node dissection • Typically unilateral (distal to the lymphatic disruption) • Associated with aching pain and diffuse nontender erythema that improves with elevation • Minimal associated warmth • Fever not typical  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 13

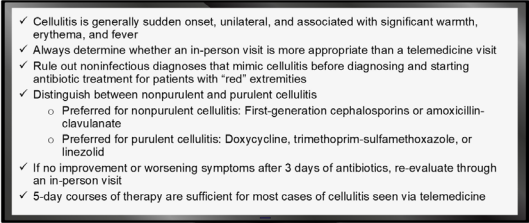
Slide Title and Commentary	Slide Number and Slide
Cellulitis Mimics – Peripheral Vascular Disease SAY: Peripheral vascular disease typically presents with chronic, gradually progressive symptoms rather than acute onset. Typical symptoms include cramping leg pain during exertion that is relieved by rest, nonhealing wounds or ulcers—particularly on the feet—and cool, shiny skin, hair loss, or thickened nails on the legs. Risk factors for peripheral vascular disease include smoking, diabetes, hypertension, hyperlipidemia, and older age. Venous stasis, lymphedema, and peripheral vascular disease can predispose to cellulitis. Ask if there has been an acute change in symptoms that would suggest a new process, such as new fever, or increased warmth, tenderness, or erythema. Examine the extremity for evidence of new superficial cutaneous edema and/or shiny and smooth skin. These symptoms suggest cellulitis. Nonurgent followup with a primary care provider is suggested for any of these conditions to discuss preventative strategies and long-term management.	Slide 14 Cellulitis Mimics – Peripheral Vascular Disease¹⁻² • Chronic, gradually progressive symptoms • Cramping leg pain during exertion relieved by rest • Nonhealing wounds or ulcers – particularly on the feet • Cool, shiny skin, hair loss, or thickened nails on legs • Risk factors: ◦ Smoking, diabetes, hypertension, hyperlipidemia, and older age AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 14
Cellulitis Mimics – Deep Venous Thrombosis (DVT) SAY: Deep venous thrombosis or a DVT is another mimic of cellulitis. Typical risk factors include hereditary thrombophilia (commonly known as clotting disorders), a previous DVT, malignancy, recent surgery, immobilization, pregnancy, or age over 65 years. Classic symptoms of a DVT include acute swelling, pain, erythema, and warmth over the affected area. It generally involves one limb. The skin is generally not involved in patients with deep venous thrombosis, although they can have some warmth. Patients highly suspected to have a DVT should be referred for an in-person evaluation, preferably to an emergency department given the likelihood of needing imaging.	Slide 15 Cellulitis Mimics – Deep Venous Thrombosis (DVT)¹⁻² • Risk factors ◦ Hereditary thrombophilia (commonly known as clotting disorders), a previous DVT, malignancy, recent surgery, immobilization, pregnancy, or age over 65 years • Acute swelling, pain, erythema, and warmth over affected area • Typically involves one limb • Skin not usually involved except for some warmth AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 15

Slide Title and Commentary	Slide Number and Slide
Cellulitis Mimics – Contact Dermatitis SAY: Patients with contact dermatitis can have lesions that look like cellulitis but are confined to the site of contact with the allergen. Contact dermatitis usually presents with erythema, pruritis, and sometimes bullae that usually appears within 1–3 days of the exposure. Patients will often be able to identify potential exposures such as bandages or lotions. Contact dermatitis can be generally managed without additional in-person followup by discontinuing the likely offending agent and applying topical corticosteroids. If the patient has been outdoors in wooded or overgrown areas, poison ivy dermatitis should be considered. It typically presents within 1–2 days of the exposure. Topical corticosteroids can help with a localized rash. Oral corticosteroids tapered over about 2 weeks may be needed for more widespread poison ivy dermatitis. The remainder of the presentation will focus on the diagnosis and management of cellulitis after alternative diagnoses have been ruled out.	Slide 16 Cellulitis Mimics – Contact Dermatitis • Can look like cellulitis but confined to site of contact with the allergen • Usually presents with erythema, pruritis, and sometimes bullae that appears within 1–3 days of the exposure • Managed by discontinuing the likely offending agent and applying topical corticosteroids • Poison ivy dermatitis should be considered if the patient has been outdoors ◦ Topical corticosteroids can help with a localized rash ◦ Oral corticosteroids tapered over ~2 weeks may be needed for more widespread poison ivy dermatitis  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 16
Moment 3: Antibiotic Therapy SAY: Let's turn our attention back to Luca, who we determined appears to have bacterial cellulitis of his left calf region. Moment 3 states, "If antibiotics are indicated, what is the narrowest, safest, and shortest regimen I can prescribe?"	Slide 17 Moment 3: Antibiotic Therapy  1. Is my patient an appropriate candidate for a telemedicine visit? 2. Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed? 3. If antibiotics are indicated, what is the narrowest, safest, and shortest regimen I can prescribe? AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 17

Slide Title and Commentary	Slide Number and Slide
Moment 3: Antibiotic Treatment for Nonpurulent Cellulitis SAY: Clinical trial data indicate that antibiotics are helpful at improving resolution of both nonpurulent and purulent cellulitis. The microbiologic etiology of cellulitis can be predicted by the type of cellulitis. The general selection of antibiotics is the same for children and adults with cellulitis. Luca is presenting with nonpurulent cellulitis. Nonpurulent cellulitis is most commonly caused by group A <i>Streptococcus</i> or other beta-hemolytic <i>streptococci</i> such as group B, C, or G. Less commonly, it is caused by methicillin-susceptible <i>Staphylococcus aureus</i> or MSSA. Methicillin-resistant <i>Staphylococcus aureus</i> or MRSA is an unlikely cause of nonpurulent cellulitis. Preferred antibiotic options for nonpurulent cellulitis that cover both beta-hemolytic <i>streptococci</i> and MSSA include oral first-generation cephalosporins such as cephalexin or cefadroxil or amoxicillin-clavulanate. It is important to inform him that you recommend filling the prescription the same day. If there is a serious allergy to all of these agents, alternative options include doxycycline, trimethoprim-sulfamethoxazole, clindamycin, or linezolid. More recent data indicate that despite historical teachings, the vast majority of beta-hemolytic streptococcal isolates are susceptible to doxycycline and trimethoprim-sulfamethoxazole. Remember, there are no longer any age restrictions with the use of doxycycline in children. Of note, data from the Centers for Disease Control and Prevention, or CDC, indicate that both streptococci and MSSA resistance to clindamycin is increasing; approximately 30 percent of MSSA isolates are not susceptible to clindamycin. It is important to review the potential side effects of all prescribed antibiotics with patients; however, they can be particularly notable with some of the alternate antibiotics being suggested. Refer to the material for the topic titled “Antibiotics and What They Treat” for a detailed overview of side effects associated with doxycycline, trimethoprim-sulfamethoxazole, clindamycin, and linezolid.	Slide 18 Moment 3: Antibiotic Treatment for Nonpurulent Cellulitis³⁻¹² • Most commonly caused by group A <i>Streptococcus</i>; less commonly caused by methicillin-susceptible <i>Staphylococcus aureus</i> or MSSA ◦ Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) is an unlikely cause of nonpurulent cellulitis • Preferred antibiotic: Oral first-generation cephalosporins (i.e., cephalexin, cefadroxil) or amoxicillin-clavulanate • Alternative in case of allergy: Doxycycline, trimethoprim-sulfamethoxazole, clindamycin, or linezolid ◦ Resistance to clindamycin at ~30% for both group A <i>Streptococcus</i> and MSSA AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 18

Slide Title and Commentary	Slide Number and Slide
Moment 3: Antibiotic Treatment for Purulent Cellulitis SAY: Purulent cellulitis is primarily caused by <i>Staphylococcus aureus</i>, both MSSA and MRSA. Patients should be encouraged to place warm compresses on the lesion to increase drainage of the underlying abscess as this will facilitate healing. Oral antibiotic options include doxycycline, trimethoprim-sulfamethoxazole, clindamycin, or linezolid. As rates of both MSSA and MRSA resistant to clindamycin are increasing in the United States, this may not be the most optimal agent to prescribe. If past culture data are available, they can be helpful to guide antibiotic decision making. The selection between doxycycline, trimethoprim-sulfamethoxazole, or linezolid should generally be guided by: (1) any available past culture results for that patient, (2) any available local data regarding MRSA susceptibility patterns to commonly prescribed antibiotics, and (3) the side effect profile of each agent. Of note, if previous cultures have grown MSSA before, it is reasonable to treat with a first-generation cephalosporin or amoxicillin-clavulanate.	Slide 19 Moment 3: Antibiotic Treatment for Purulent Cellulitis⁴⁻¹³ - Primarily caused by <i>S. aureus</i>, both MSSA or MRSA - Warm compresses increase drainage of the underlying abscess - Oral antibiotics: Doxycycline, trimethoprim-sulfamethoxazole, clindamycin, or linezolid - Note that rates of both MSSA and MRSA resistant to clindamycin are increasing - Past culture data can be helpful in guiding antibiotic decision making - Selection among doxycycline, trimethoprim-sulfamethoxazole, or linezolid should be guided by available past culture results, general data on local susceptibility patterns, and side effect profiles AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 19
Moment 3: Duration of Antibiotic Therapy SAY: Most cases of cellulitis can be treated with 5 days of antibiotics. This recommendation is supported by evidence from clinical trials showing that shorter course therapy is as effective as longer courses. For example, a randomized clinical trial compared 5 versus 10 days of therapy for patients with cellulitis. Patients with bacteremia, severe sepsis, and deep soft-tissue infections were excluded. All patients received antibiotics for 5 days. If they were experiencing at least minimal improvement in warmth, erythema, tenderness, and edema on day 5, they were randomized to receive either placebo or 5 more days of antibiotics therapy. Clinical success was achieved by 98 percent of patients in both groups.	Slide 20 Moment 3: Duration of Antibiotic Therapy¹⁴⁻¹⁶ Can be treated with 5 days of antibiotics based on clinical trial results  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 20

Slide Title and Commentary	Slide Number and Slide
Moment 4 SAY: Moving on to Moment 4, the first part of Moment 4 asks, “What symptomatic relief should I offer or prescribe to my patient?” while the second part states “What should I tell my patient about the expected course and the followup plan?”	Slide 21 Moment 4  1. Is my patient an appropriate candidate for a telemedicine visit? 2. Does my patient have signs and symptoms indicating an infection that may require antibiotics? Is a diagnostic test needed? 3. If antibiotics are indicated, what is the narrowest, safest, and shortest regimen I can prescribe? 4. What symptomatic relief should I offer or prescribe to my patient? What should I tell my patient about the expected course and the followup plan? AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 21
Moment 4: Supportive Care SAY: Aside from acetaminophen (Tylenol®) or ibuprofen (Motrin®, Advil®) as needed, additional medications are generally not necessary. Elevation of the affected extremity whenever possible—particularly when a lower extremity is involved—can be helpful to expedite improvement. Whenever possible, keep the wound uncovered both to track progress of the affected site and to reduce the entry of other microorganisms. If there is significant drainage or daily activities make it challenging to keep the wound uncovered (e.g., working at a construction site), then it is reasonable to keep the wound loosely covered, as needed and to inspect the site at least 2–3 times a day.	Slide 22 Moment 4: Supportive Care • Acetaminophen (Tylenol®) or ibuprofen (Motrin®, Advil®) as needed • Elevation of affected extremity can expedite improvement • Whenever possible, keep the wound uncovered both to track progress and to reduce entry of other bacteria AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 22
Moment 4: Followup Plan SAY: Patients with cellulitis should be guided to seek in-person medical care if their symptoms are not improving by day 3. Patients should be advised to present to a local emergency department if the cellulitis is rapidly spreading, bullae are developing, the lesion is becoming necrotic, or they are feeling increasingly ill. A slight increase or lack of change in the size of margins of erythema after a few doses of antibiotics does not indicate antibiotic failure. Toxin production can cause extensive local inflammation, and its persistence or extension over the first two days of therapy does not by itself indicate antibiotic failure. However, the erythema should become less intense, and systemic symptoms such as fever should improve within 48–72 hours of antibiotic initiation.	Slide 23 Moment 4: Followup Plan¹⁷ • Seek in-person medical care if symptoms are not improving by day 3 ◦ Toxin production can cause extensive local inflammation ◦ Slight increase or lack of change in the size of margins of erythema after a few doses of antibiotics does not indicate failure ◦ Erythema should become less intense, and systemic symptoms such as fever should improve within 48–72 hours of antibiotic initiation • Present to a local emergency department if cellulitis is rapidly spreading, bullae are developing, the lesion is becoming necrotic, or feeling increasingly ill  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 23

Slide Title and Commentary	Slide Number and Slide
Take-Home Messages SAY: To summarize, cellulitis is generally of sudden onset, unilateral, and associated with significant warmth, erythema, and fever. Always determine whether an in-person visit is more appropriate than a telemedicine visit. Additionally, make sure to rule out noninfectious diagnoses that mimic cellulitis before diagnosing and starting antibiotic treatment for patients with “red” extremities. Distinguish between nonpurulent and purulent cellulitis; first-generation cephalosporins or amoxicillin-clavulanate are generally sufficient for nonpurulent cellulitis. In contrast, MRSA coverage should be considered for purulent cellulitis. If patients have no improvement or worsening symptoms after 3 days of antibiotic treatment, they should be re-evaluated through an in-person visit. Approximately 5-day courses of therapy are sufficient for most cases of cellulitis seen via telemedicine. You can review additional toolkit resources about how you and your practice will manage cellulitis, such as the brief summary on managing cellulitis in the telemedicine setting intended for clinicians and healthcare workers, the sample patient portal scripts for communicating with patients efficiently about cellulitis, and the patient and family education materials.	Slide 24 Take-Home Messages  AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 24
Disclaimer SAY: Please review this disclaimer.	Slide 25 Disclaimer - The findings and recommendations in this presentation are those of the authors, who are responsible for its content, and do not necessarily represent the views of AHRQ. No statement in this presentation should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services. - Participants have an implied responsibility to use the newly acquired information to enhance patient outcomes and their own professional development. The information presented in this activity is not meant to serve as a guideline for patient management. Any procedures, medications, or other courses of diagnosis or treatment discussed or suggested in this activity should not be used by clinicians without evaluation of their patient's conditions and possible contraindications and/or dangers in use, review of any applicable manufacturer's product information, and comparison with recommendations of other authorities. AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 25

Slide Title and Commentary	Slide Number and Slide
References 1 SAY: Here are the references.	Slide 26 References 1 - Hirschmann JV, Raugi GJ. Lower limb cellulitis and its mimics: part I. Lower limb cellulitis. <i>J Am Acad Dermatol</i>. 2012 Aug;67(2):163.e1-12; quiz 175-6. PMID: 22794815. - David CV, Chira S, Ellis SJ, et al. Diagnostic accuracy in patients admitted to hospitals with cellulitis. <i>Dermatol Online J</i>. 2011 Mar; 15(17):1. PMID: 21420867. - Moran GJ, Krishnadasan A, Mower WR, et al. Effect of cephalixin plus trimethoprim-sulfamethoxazole vs cephalixin alone on clinical cure of uncomplicated cellulitis: A randomized clinical trial. <i>JAMA</i>. 2017 May 23;317(20):2088-2096. PMID: 28535235. - Byströmsky R, Chambers H. Cellulitis and soft tissue infections. <i>Ann Intern Med</i>. 2018 Feb 6;168(3):ITC17-32. PMID: 29404597. - Jeng A, Beheshti M, Li J, et al. The role of beta-hemolytic streptococci in causing diffuse, nonculturable cellulitis: a prospective investigation. <i>Medicine (Baltimore)</i>. 2010 Jul;89(4):217-228. PMID: 20616661. - Talan DA, Mower WR, Krishnadasan A, et al. Trimethoprim-sulfamethoxazole versus placebo for uncomplicated skin abscess. <i>N Engl J Med</i>. 2016 Mar 3;374(9):823-32. PMID: 26962903. - Khamash DF, Voskertchian A, Tamra PD, et al. Increasing clindamycin and trimethoprim-sulfamethoxazole resistance in pediatric <i>Staphylococcus aureus</i> infections. <i>J Pediatric Infect Dis Soc</i>. 2019 Sep 25;8(4):351-353. PMID: 30011009. - Miller LG, Daum RS, Creech CB, et al. Clindamycin versus trimethoprim-sulfamethoxazole for uncomplicated skin infections. <i>N Engl J Med</i>. 2015 Mar 19;372(12):1093-103. PMID: 25785967. AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 26
References 2 SAY: Here are the references.	Slide 27 References 2 - Bowen AC, Carapetis JR, Currie BJ, et al. Sulfamethoxazole-trimethoprim (cotrimoxazole) for skin and soft tissue infections including impetigo, cellulitis, and abscess. <i>Open Forum Infect Dis</i>. 2017 Nov 2;4(4):ofx232. PMID: 29255730. - Pulia M, Fox B. Antibiotics should not be routinely prescribed after incision and drainage of uncomplicated abscesses. <i>Ann Emerg Med</i>. 2019 Apr;73(4):377-8. PMID: 30902165. - Lipky BA, Senneville E, Abbas ZG, et al. Guidelines on the diagnosis and treatment of foot infection in persons with diabetes (IWGDF 2019 update). <i>Diabetes Metab Res Rev</i>. 2020 Mar;36 Suppl 1:e3280. PMID: 32176444. - Senneville E, Albaladejo J, van Asten SA, et al. IWGDF/IDSA guidelines on the diagnosis and treatment of diabetes-related foot infections (IWGDF/IDSA 2023). <i>Diabetes Metab Res Rev</i>. 2024 Mar;40(3):e3687. Epub 2023 Oct 1. PMID: 37778323. - Todd SR, Dahlgren FS, Traeger MS, et al. No visible dental staining in children treated with doxycycline for suspected rocky mountain spotted fever. <i>J Pediatr</i>. 2015 May;166(5):1246-51. PMID: 25794784. - Hepburn MJ, Dooley DP, Skidmore PJ, et al. Comparison of short-course (5 days) and standard (10 days) treatment for uncomplicated cellulitis. <i>Arch Intern Med</i>. 2004 Aug 9;164(15):1669-74. PMID: 15302637. - Prokocimer P, De Anda C, Fang E, et al. Tedizolid phosphate vs linezolid for treatment of acute bacterial skin and skin structure infections: the ESTABLISH-1 randomized trial. <i>JAMA</i>. 2013 Feb 13;309(8):559-69. PMID: 23403680. - Moran GJ, Fang E, Corey GR, et al. Tedizolid for 6 days versus linezolid for 10 days for acute bacterial skin and skin-structure infections (ESTABLISH-2): a randomised, double-blind, phase 3, non-inferiority trial. <i>Lancet Infect Dis</i>. 2014 Aug;14(8):696-705. PMID: 24909499. AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 27
References 3 SAY: Here are the references.	Slide 28 References 3 Bruun T, Oppegård O, Hufthammer KO, et al. Early response in cellulitis: a prospective study of dynamics and predictors. <i>Clin Infect Dis</i>. 2016 Oct 15;63(8):1034-41. PMID: 27402819. AHRQ Safety Program for Telemedicine: Improving Antibiotic Use Cellulitis 28