

AHRQ Safety Program for Telemedicine: Improving Antibiotic Use

Best Practices in Managing Cellulitis Over Telemedicine

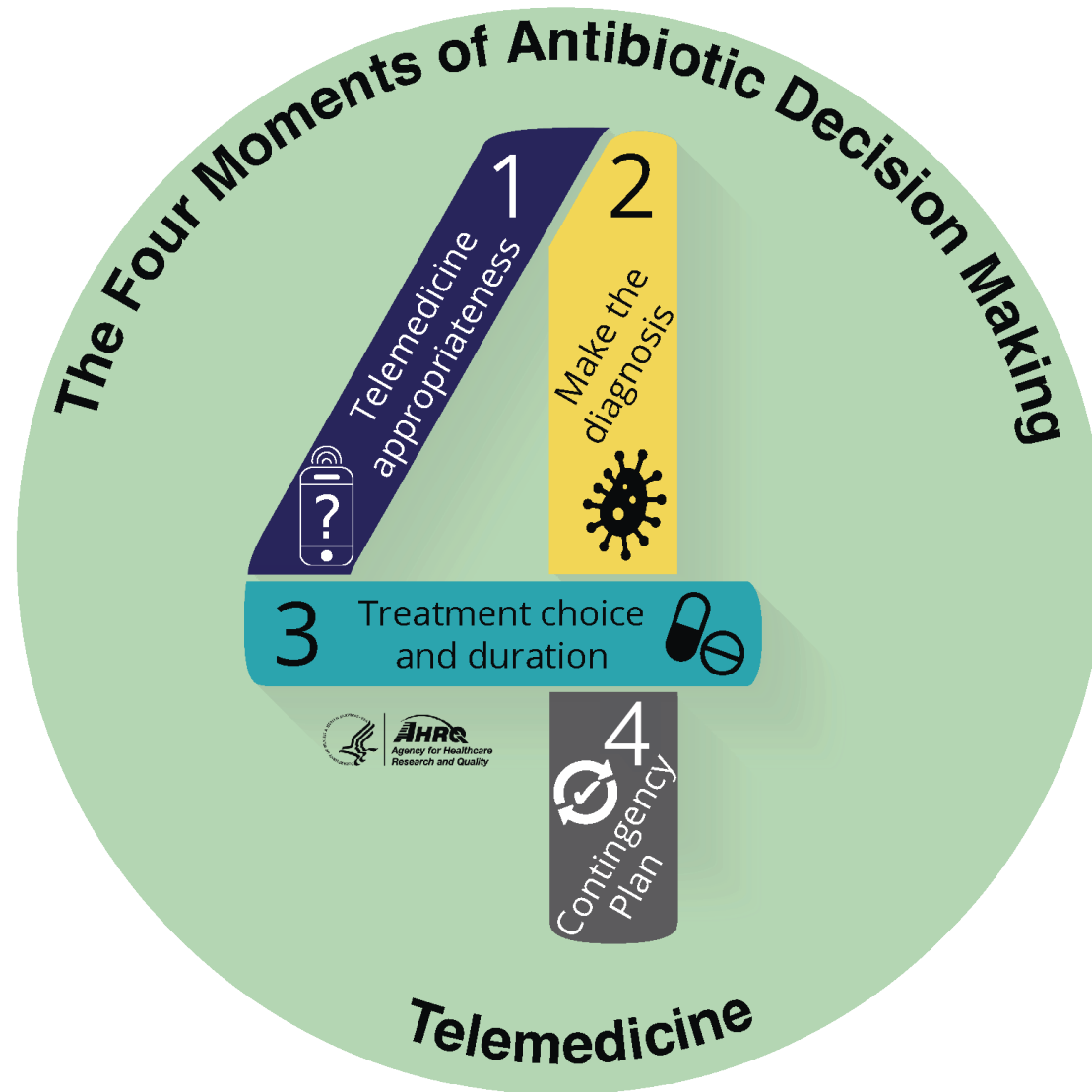


Objectives

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

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?

Case Presentation

A 46-year-old man named Luca presents with a red, warm, painful area on his left calf



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?



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?



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



Moment 1: Virtual Physical Examination

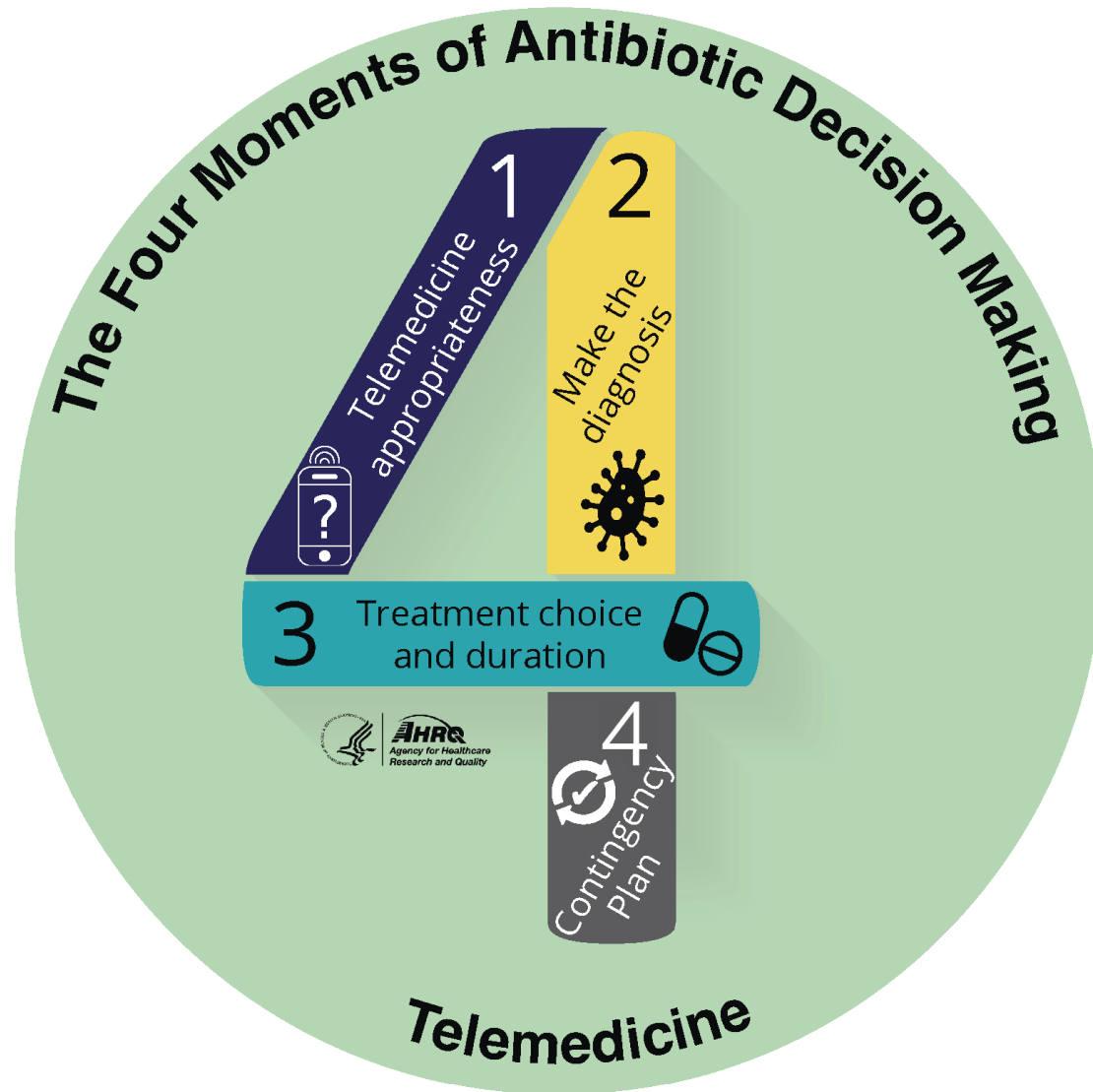
- Temperature: 100.9 degrees Fahrenheit
- Heart rate: 96 beats per minute
- Erythematous lesion on left calf without drainage
- No bullae or necrosis
- Knee and ankle not swollen and no limitations in movement
- No associated tinea pedis



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)

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?

Non-Purulent Versus Purulent Cellulitis

Nonpurulent cellulitis



Purulent cellulitis



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



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



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

Cellulitis Mimics – Deep Venous Thrombosis (DVT)¹⁻²

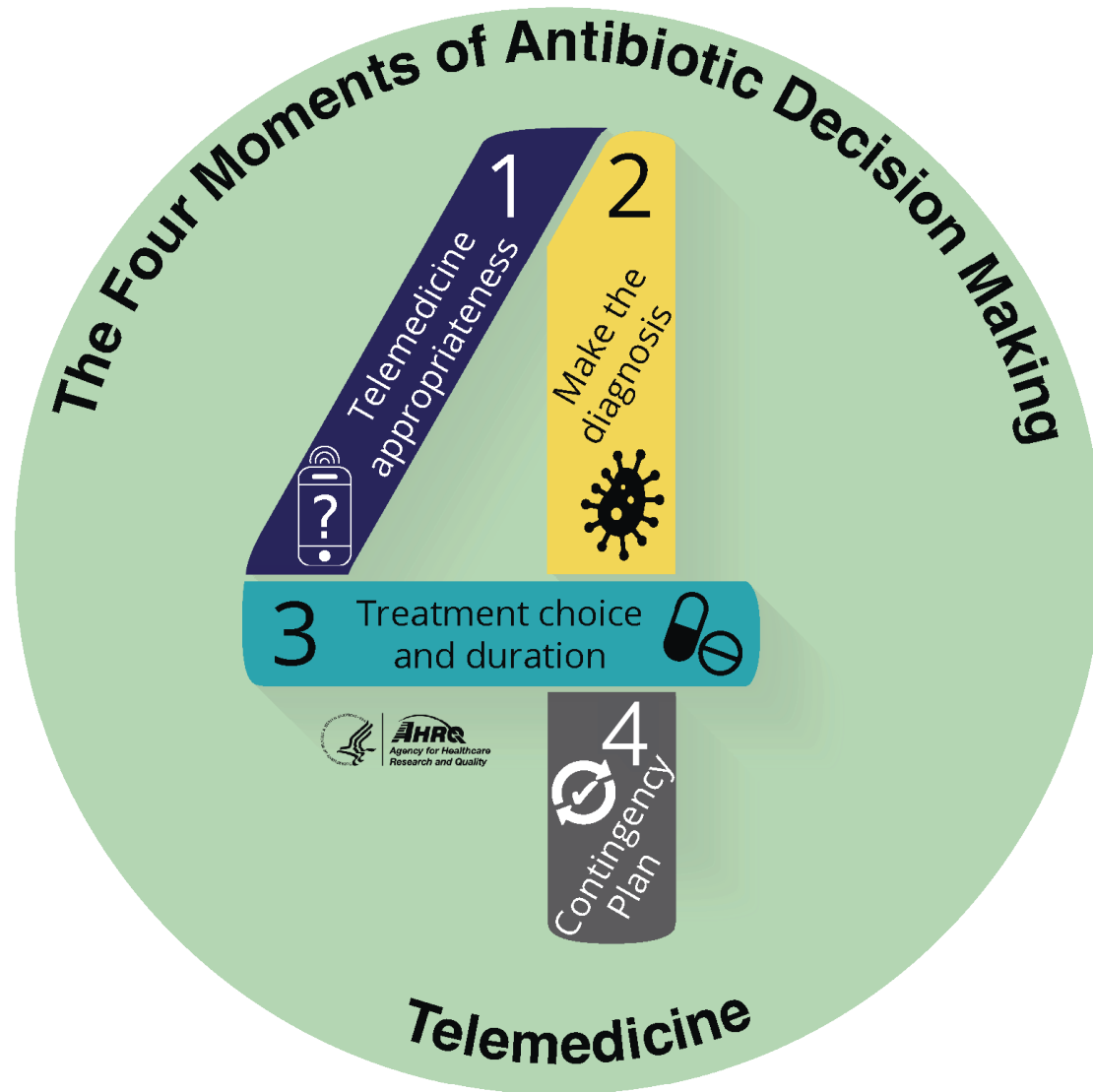
- Risk factors
 - Hereditary thrombophilia (commonly known as clotting disorders), a previous DVT, malignancy, recent surgery, immobilization, pregnancy, or age over 65 years
- Acute swelling, pain, erythema, and warmth over affected area
- Typically involves one limb
- Skin not usually involved except for some warmth

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



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?

Moment 3: Antibiotic Treatment for Nonpurulent Cellulitis³⁻¹²

- Most commonly caused by group A *Streptococcus*; less commonly caused by methicillin-susceptible *Staphylococcus aureus* or MSSA
 - Methicillin-resistant *Staphylococcus aureus* (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 *Streptococcus* and MSSA

Moment 3: Antibiotic Treatment for Purulent Cellulitis⁴⁻¹³

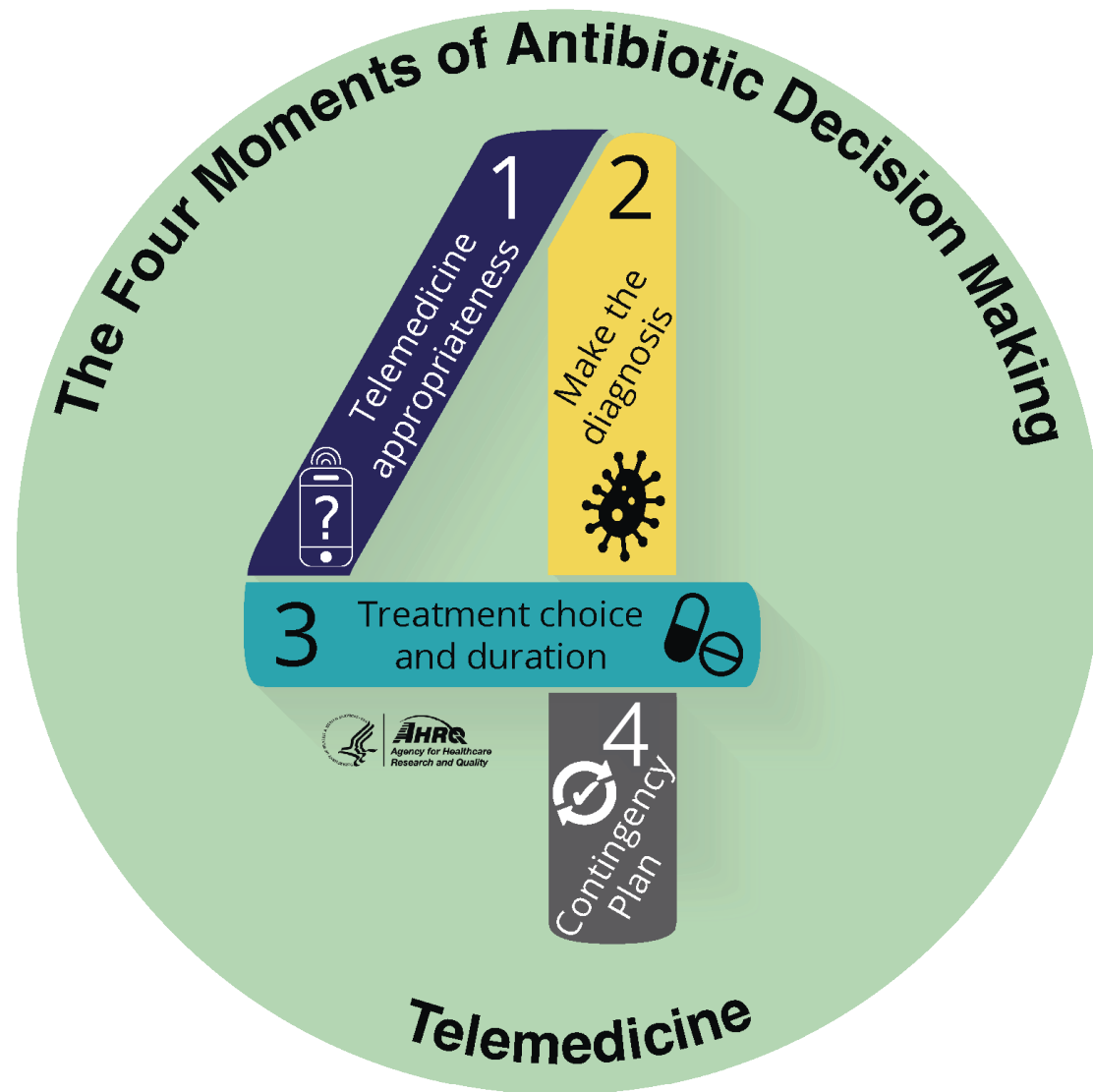
- Primarily caused by *S. aureus*, both MSSA or MRSA
- Warm compresses increase drainage of the underlying abscess
- Oral antibiotics: Doxycycline, trimethoprim-sulfamethoxazole, clindamycin, or linezolid
 - Note that rates of both MSSA and MRSA resistant to clindamycin are increasing
- Past culture 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

Moment 3: Duration of Antibiotic Therapy¹⁴⁻¹⁶

- Can be treated with 5 days of antibiotics based on clinical trial results



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?

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

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



Take-Home Messages

- ✓ Cellulitis is generally 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
- ✓ Rule out noninfectious diagnoses that mimic cellulitis before diagnosing and starting antibiotic treatment for patients with “red” extremities
- ✓ Distinguish between nonpurulent and purulent cellulitis
 - Preferred for nonpurulent cellulitis: First-generation cephalosporins or amoxicillin-clavulanate
 - Preferred for purulent cellulitis: Doxycycline, trimethoprim-sulfamethoxazole, or linezolid
- ✓ If no improvement or worsening symptoms after 3 days of antibiotics, re-evaluate through an in-person visit
- ✓ 5-day courses of therapy are sufficient for most cases of cellulitis seen via telemedicine

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