

# [Osteomyelitis and staphylococcus aureus](https://assignbuster.com/osteomyelitis-and-staphylococcus-aureus/)

Thomas Antony

Microbiology Grand Rounds Case Scenario VI

Case Scenario #VI Summary

Objective #1: What is the pathogenesis of this infection?

* Osteomyelitis occurs when:
* You experience trauma leading to bone damage
* Organism inoculation
* Presence of a foreign material
* Most commonly, in children, it arises as a consequence of a hematogenous spread of bacteria (ex. Staphylococcus Aureus)
* Begins in areas with high vascularity due to slower blood flow

Objective #2: What is Staphylococcus Aureus? How does it relate to the normal flora? What are the portals of entry?

* Staphylococcus aureus is :
* Gram positive cocci, catalase-positive, and coagulase-positive
* Facultative aerobe
* Is a potentially lethal opportunistic pathogen
* Enzymes (ex. Coagulase, lipase, staphylokinase, beta-lactamase)
* Toxins (ex. Cytolytic toxins, leukocidin, exotoxin, toxic shock syndrome toxins)
* Structural defences (ex. Protein A, slime layer).
* Normal Flora:
* Human commensal, asymptomatically colonizing about 30% of the human population
* Found in nasal passages, axillae, inguinal, perineal areas, skin (along with S. epidermidis)
* Those who are colonized have a higher risk for developing infections
* Portals of entry:
* Staphylococcal infections remain localized at the portal of entry by the normal host defenses
* Skin, mucous membranes, respiratory system, gastrointestinal system, genitourinary tract, conjunctiva of the eye, placenta, parenteral route

Objective #3: Is Owen at risk for this infection as well?

* S. aureus transmission is by:
* Direct contact with colonized individuals, contaminated objects and inhalation of infected droplets
* Children are more commonly affected than adults because:
* Prone to hematogenous osteomyelitis
* Improper handwashing/hygiene (too young)
* Rich vasculature
* Immune system not fully developed

Objective #4: What is osteomyelitis? How did this infection develop? Who is most at risk for this type of infection? Why?

* Osteomyelitis is inflammation of the bone
* Majorly caused by bacterial infection, tissue injury/trauma (Direct), bacteremia.
* Symptoms of pain, swelling and redness around the infected area, fever
* Hematogenous osteomyelitis, injury â†’ Blood vessels â†’ Bacteremia â†’ Bones
* People who are most at risk are those with::
* Recent injuries, circulation disorders, impaired immune system, IV line or catheter, and the elderly
* Infants and young children are more susceptible because they are:
* Prone to hematogenous osteomyelitis
* Improper handwashing/hygiene
* Clumsy â†’ Injury
* Rich vasculature
* Immune system not fully developed

Objective #5: What was the purpose of the prescribed orders? Why did the antibiotic therapy change?

* Start with empiric therapy because of broad spectrum and to control the spreading
* After confirming we use targeted therapy
* Ampicillin – Possible lactamase resistance
* Gentamicin – Not sufficient in killing intracellular bacteria

Objective #6: What is the rationale for IV therapy? What is the rationale for 6 weeks of therapy?

* Higher bioavailability through the IV route compared to the oral route as it goes directly into the blood stream; PICC lines generally have a 100% bioavailability.
* For osteomyelitis, bacteria might be thriving even with lessened symptoms. Patients should continue taking antibiotics until they have finished the 6 week course as it makes sure the bacteria is gone and the infection is dealt with.

Objective #7: What steps could be taken to reduce the risk of acquiring this type of infection?

* Avoiding infection
* Improving your health by:
* Stopping smoking, healthy diet, managing your weight, alcohol, an regular exercise

## References

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