

Daptomycin (Cubicin)

Daptomycin is a member of a newer class of antibiotics called cyclic lipopeptides. As the phenomenon of antibiotic-resistant bacteria becomes more prevalent, the need for newer, alternative mechanisms of action to combat infection has similarly expanded. While this antibiotic has a relatively narrow window of therapeutic indications and some significant adverse effects, it has nonetheless proven its value in treating gram-positive skin and soft tissue infections, along with bacteremia, endocarditis, VRE and MRSA.



PLAY PICMONIC

Mechanism Of Action

Lipopeptide Antibiotic

[Lip-o-pimp-tie ABX-guy](#)

Daptomycin is classified as a lipopeptide antibiotic. These drugs have a structure similar to that of bacteria, with a lipid group attached to a peptide. Because of this, Daptomycin is capable of aggregating in the cell membrane and causing destruction by distortion of the cell membrane.

Disrupts Cell Membrane

[Disrupting Cell](#)

Once incorporated into the cell membrane of the bacteria, this antibiotic alters their membrane structure, creating porous membranes that can no longer maintain a membrane potential.

Causes Rapid Depolarization

[Rapid-rabbit and D-polar-bear](#)

After Daptomycin causes a porous membrane to develop, the bacteria can no longer maintain membrane potential. This porous membrane environment allows destabilization of the membrane potential, which interferes with DNA, RNA and protein synthesis, subsequently resulting in cell death.

Indication

Gram-Positive Cocci

[Graham-cracker Positive-angel with Cock-eyes](#)

This antibiotic demonstrates maximum efficacy on thin-walled, gram-positive cocci, particularly those causing skin and soft tissue infections, bacteremia, endocarditis and VRE.

MRSA

[MR. Saw](#)

Daptomycin has also demonstrated usefulness in combating methicillin-resistant staphylococcus aureus (MRSA), which is a dangerous organism, given its growing difficulty to satisfactorily eradicate with standard antibiotics.

Side Effects

Myopathy

[Mayo-party-hat](#)

A common side effect of Daptomycin is myopathy, similar to statin medications. Thus, practitioners should be cautious of myopathy in patients on these medications, particularly if they are given simultaneously.

Rhabdomyolysis

[Rabbi-muscle-lights](#)

Daptomycin can lead to muscle tissue damage. In some instances, the muscular involvement may be so severe and rapid that it results in rhabdomyolysis. This is described as the destruction of muscle cells and the subsequent release of their intracellular components into circulation. This can be evaluated by measuring serum levels of creatinine phosphokinase, or CPK. This is a rather high-yield association to recall, so be sure to remember that both statins and Daptomycin are capable of muscular destruction, especially if they are used in conjunction. For this reason, the serum CPK should be measured.

Peripheral Neuropathy

[Purple-wavy Neuron-extremities](#)

Another side effect to be aware of with Daptomycin use is the development of peripheral neuropathy. Patients can develop changes in distal sensation, such as numbness, tingling, aching, burning, or loss of vibration, temperature and proprioception.

Considerations & Patient Education

Inactivated by Surfactant

[Stopped by Surf-surfactant](#)

One of the major limitations of this antibiotic is that it is inactivated by surfactant, rendering it useless against pneumonia.

Not Used (Avoid) for Pneumonia

[Avoid-sign Nude-mona](#)

Because Daptomycin is neutralized by surfactant, it should not be used to treat pneumonia.