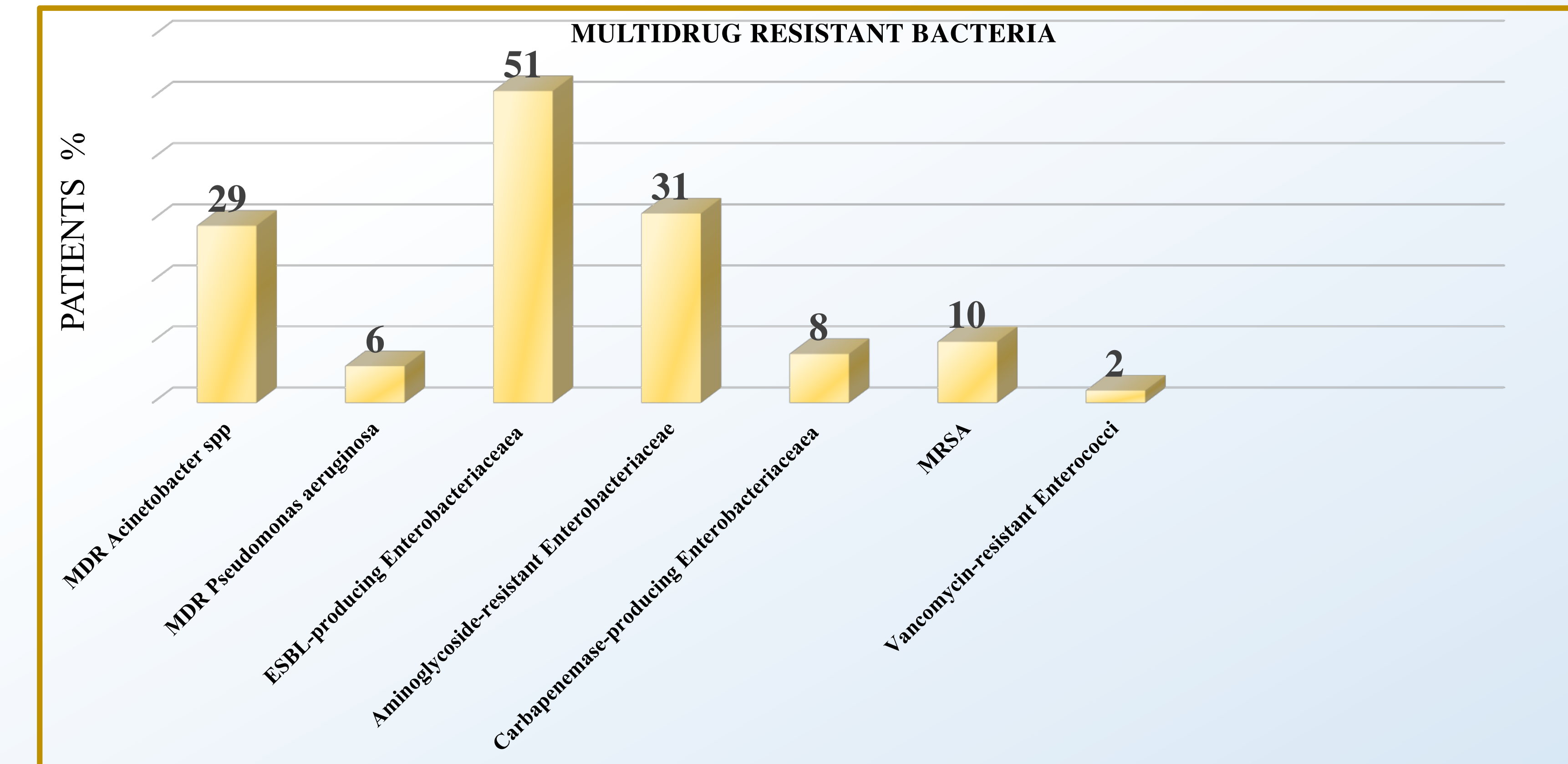
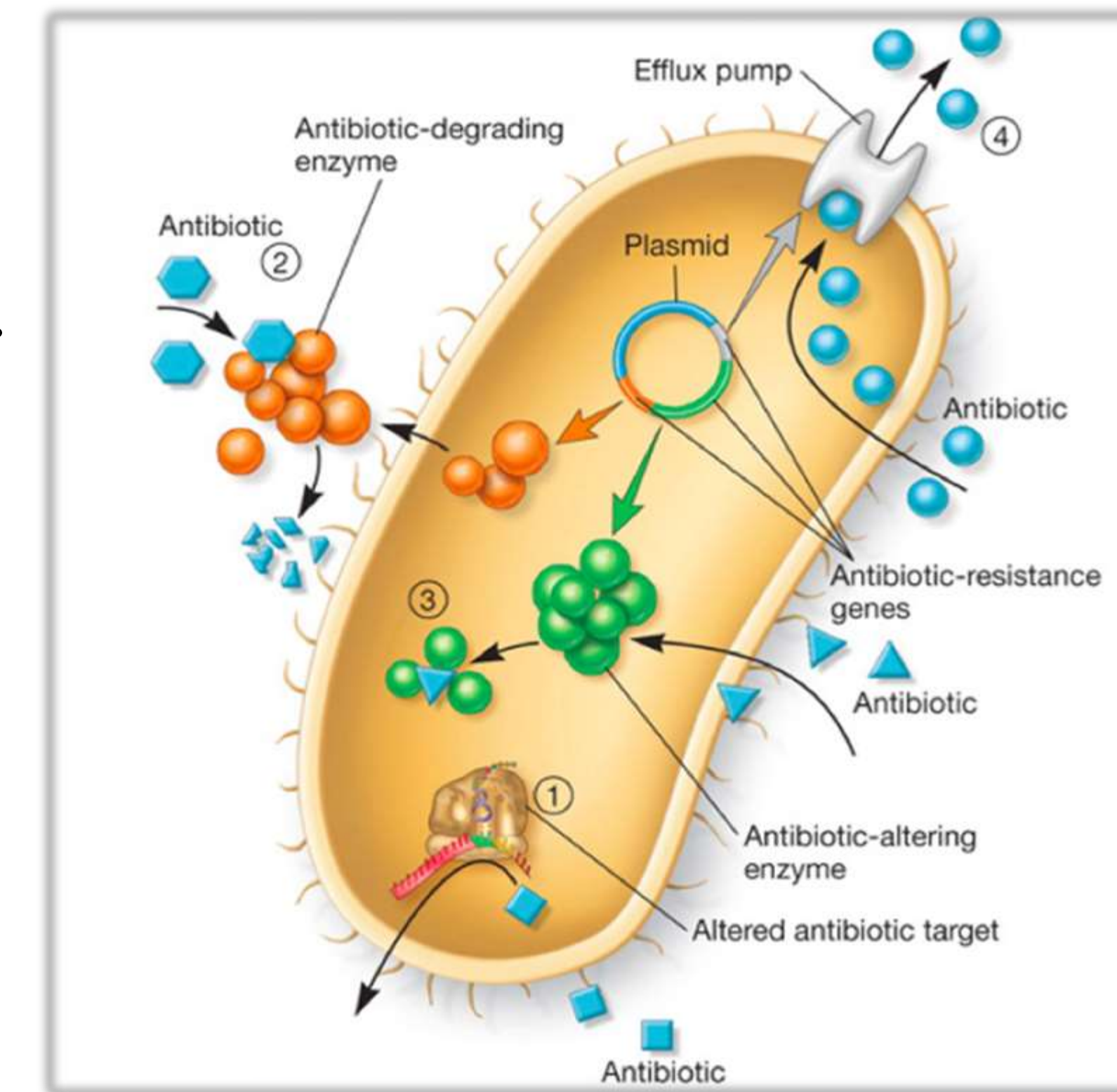


Introduction:

Antibiotic resistance occurs when bacteria lose their sensitivity to antibiotics. It develops when a bacteria mutates or acquires a resistance gene. The rapid emergence of resistant bacteria is occurring worldwide, endangering the efficacy of antibiotics, which have transformed medicine and saved millions of lives. Many decades after the first patients were treated with antibiotics, bacterial infections have again become a threat. The antibiotic resistance crisis has been attributed to the overuse and misuse of these medications, as well as a lack of new drug development by the pharmaceutical industry.⁽¹⁾

How Antibiotic Resistance Occurs?

- Modifications of the antibiotic molecule.
- Decreased antibiotic penetration and efflux.
- Changes in target sites.
- Resistance due to global cell adaptations.⁽²⁾



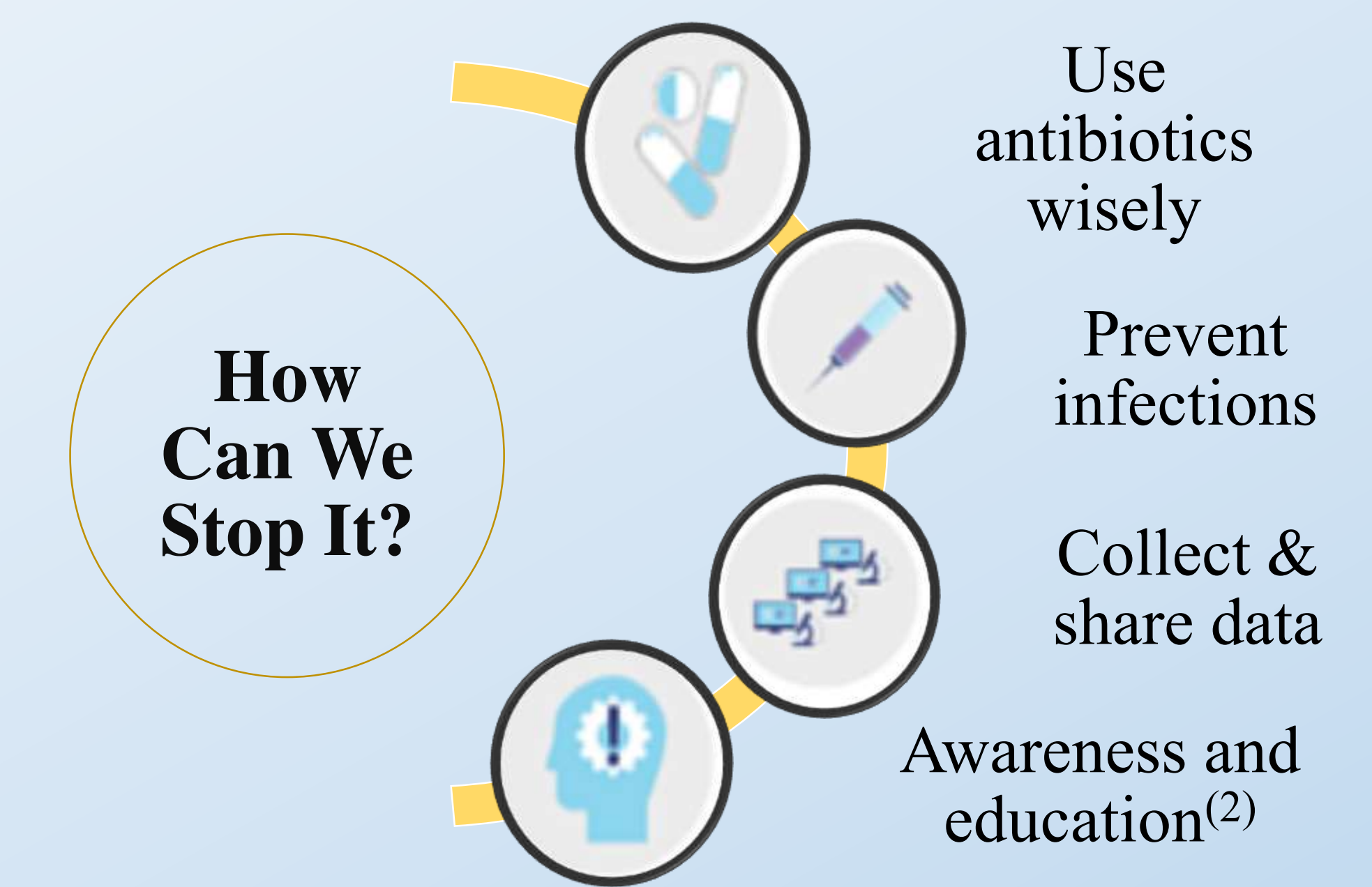
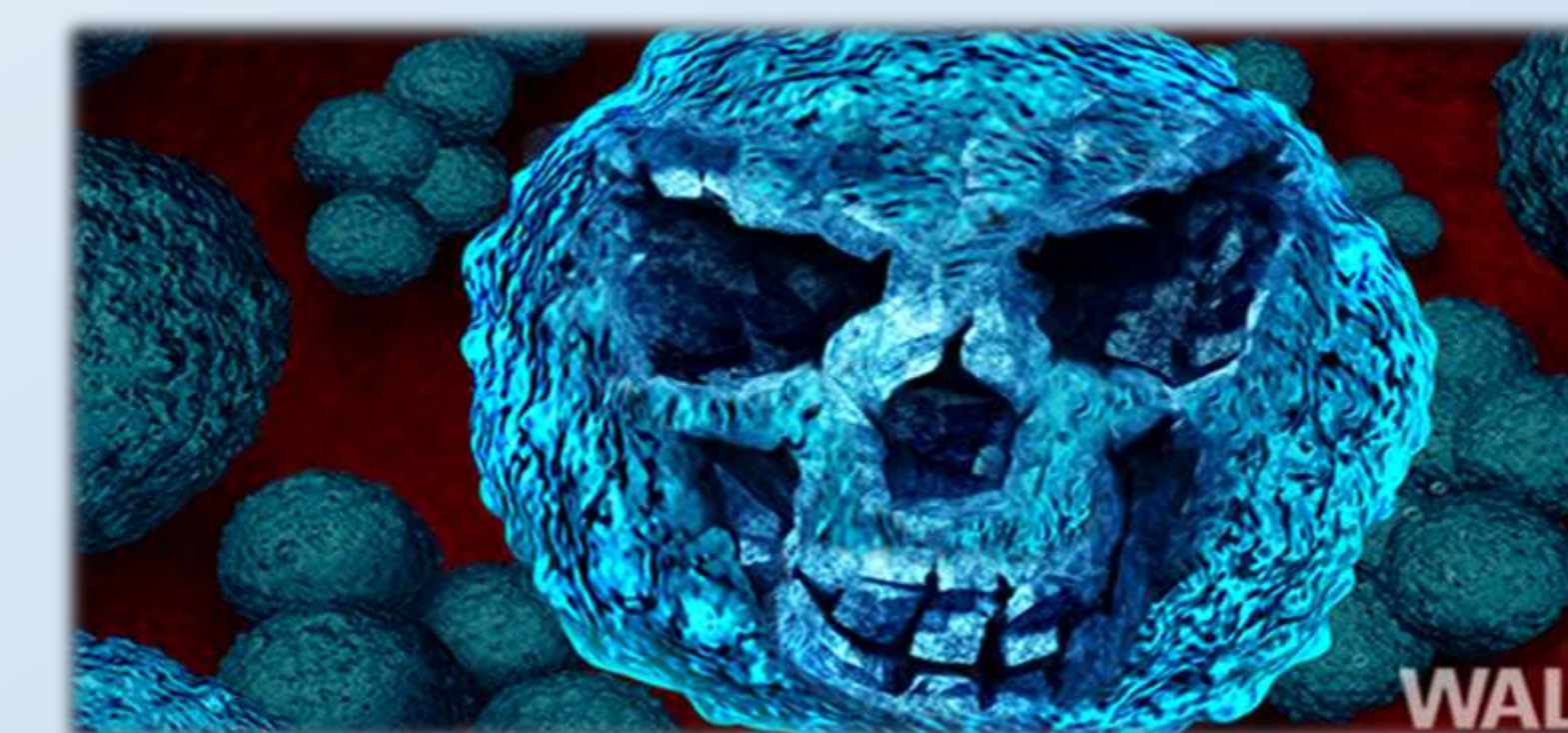
Multidrug-resistant bacteria cultured from 51 Libyan war casualties transferred to the Netherlands.⁽⁴⁾

Complications:

- Minor bacterial infections can become a serious problem.
- Surgery that relies on antibiotics to fight infections could be deadly.
- Transplant surgery is near-impossible.
- Some cancer patients are at higher risk.
- A large number of potentially deadly infections are untreatable.⁽³⁾

A Terrifying Superbug:

In late 2015, Chinese researchers found a plasmid-mediated strain of colistin-resistant *E.coli* on a Chinese hog farm. The gene known as *mcr-1* was found in about 1% of *E. coli* bacteria and 1% of *Klebsiella pneumoniae*. An alarming feature of *mcr-1* is that the gene moves easily from bug to bug and also from a family like *E.coli* to others. China has a “massive” problem with what are known as CREs—carbapenem resistant Enterobacteriaceae. The fear is that bacteria that can resist off carbapenems will also acquire the ability to evade colistin producing untreatable superbugs with the power to turn back the clock on modern medicine.⁽³⁾

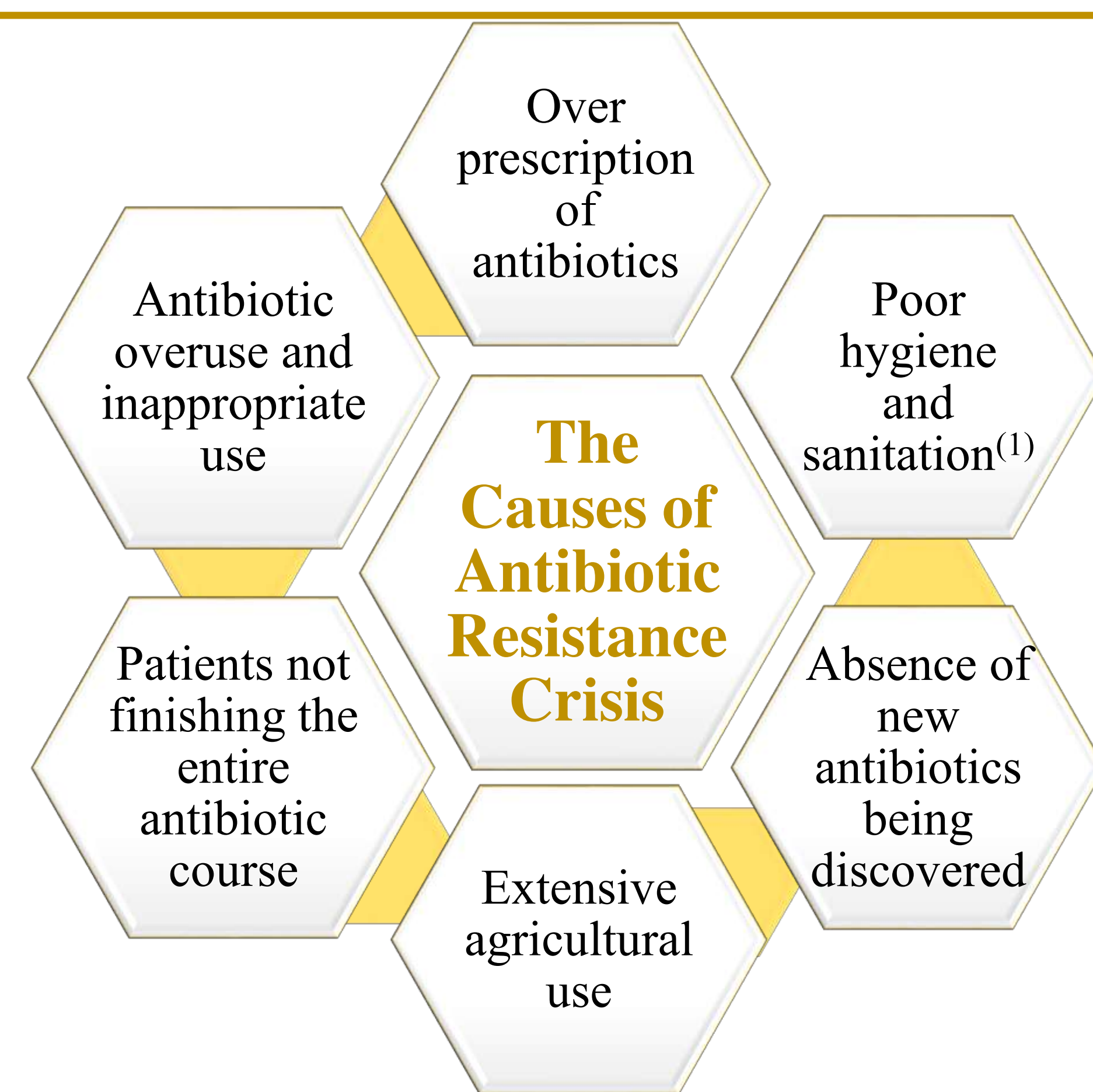


Conclusion:

Antimicrobial resistance occur when a microorganism's resistance to an antimicrobial drug that was once able to treat an infection by that microorganism. Increasing bacterial resistance is mainly caused by the misuse, overuse, and misprescription of antibiotics.

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How Bacteria Resist An Antibiotic?

- Intrinsic resistance.
- Acquired resistance.
- Genetic change.
- DNA transfer.⁽²⁾

