

Microbe of the month

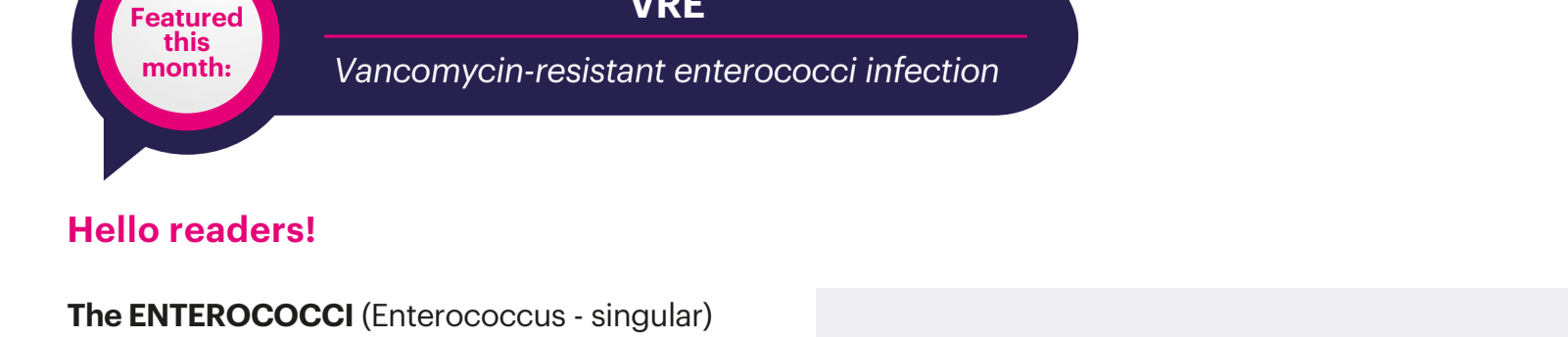
Breaking The Chain of Infection

Cutimed®

MAY 2021 NEWSLETTER

Compiled by
Helen Loudon IPC Consultant

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Featured this month:

VRE

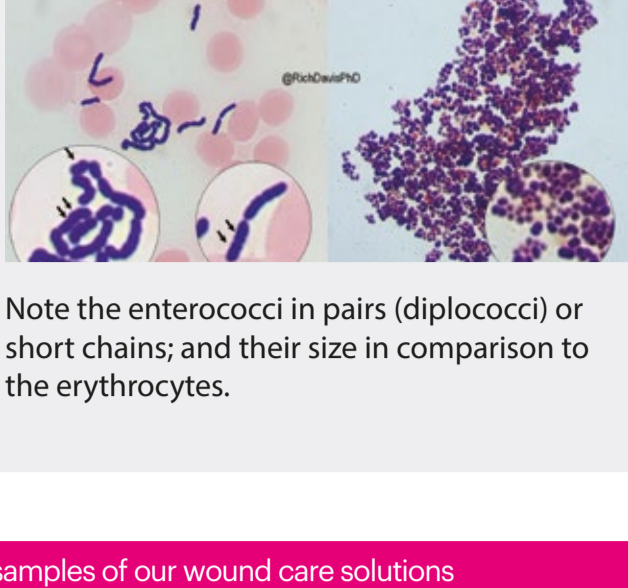
Vancomycin-resistant enterococci infection

Hello readers!

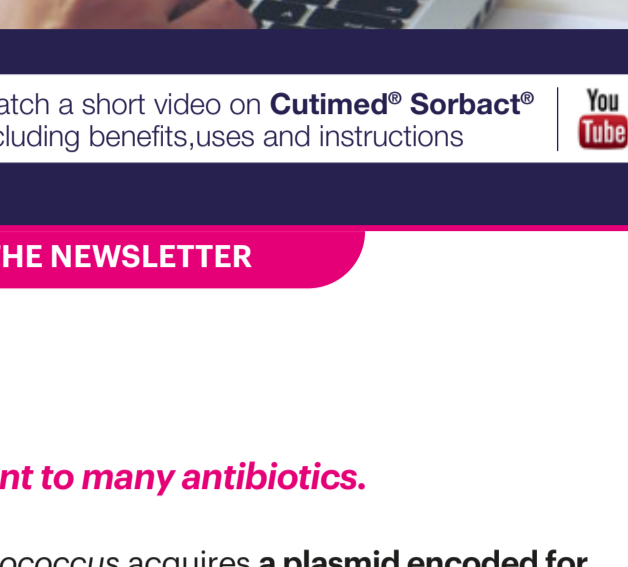
The **ENTEROCOCCI** (*Enterococcus* - singular) are hardy, opportunistic Gram-positive cocci which occur in pairs or short chains. They are **commensal bacteria**, normally present in the human intestines, the female genital tract, and the environment. Enterococci can tolerate extremes in physical conditions, including temperature variations between 10-45°C, and hypotonic, hypertonic, acidic or alkaline environments. As **facultative organisms**, enterococci can grow in aerobic as well as anaerobic conditions.

Of the over 20 *Enterococcus* species, 2 species are particularly pathogenic to man. *Enterococcus faecalis* causes 85-90% of enterococci infections while *Enterococcus faecium* causes 5-10%.

They are a major cause of **healthcare-associated infections**, especially **bacteraemia, endocarditis, meningitis (neonates), and urinary tract and surgical site infections**. Enterococci infection is equally distributed between sexes, although urinary tract infections are understandably more common in women and in elderly patients following urinary instrumentation.

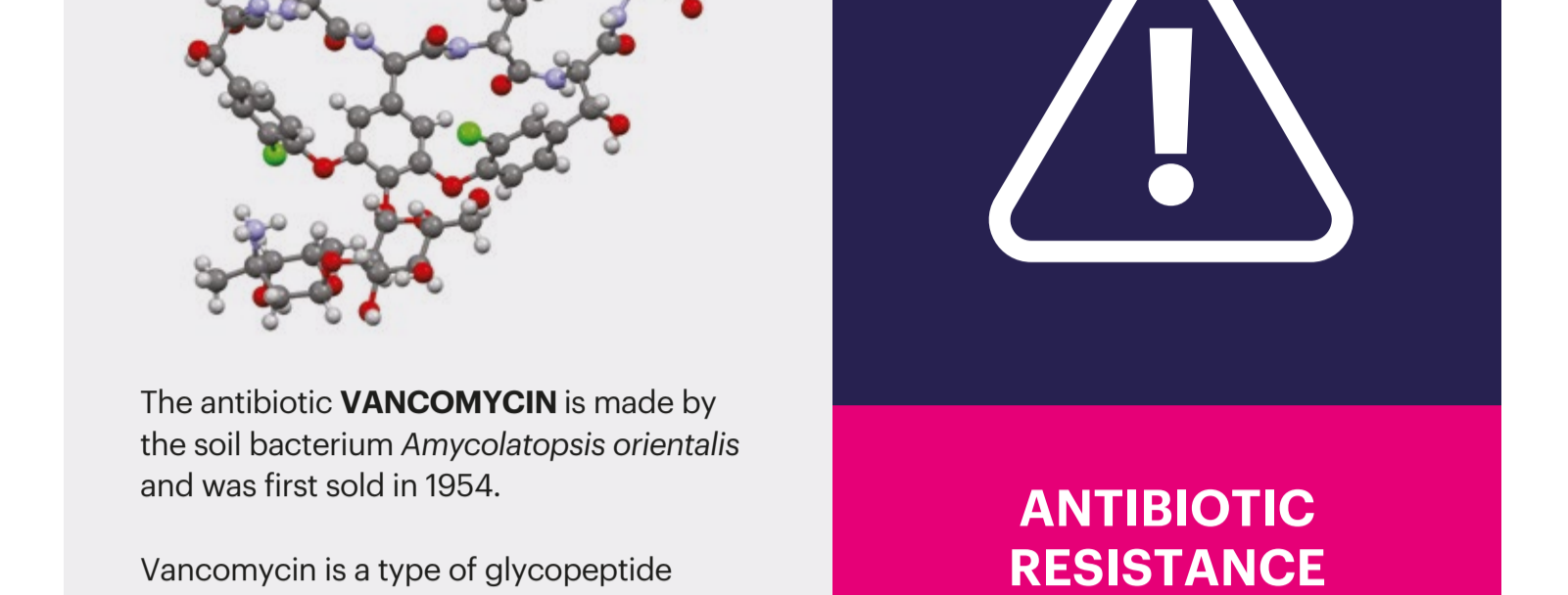


Enterococcus faecalis under the microscope illustrating the Gram-positive ovoid diplococci arranged in short chains.



Note the enterococci in pairs (diplococci) or short chains; and their size in comparison to the erythrocytes.

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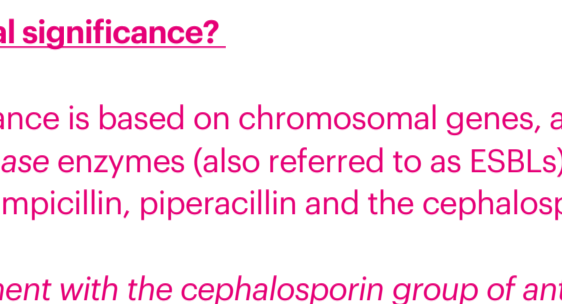
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VANCOMYCIN RESISTANCE

The enterococci are intrinsically (naturally) resistant to many antibiotics.

Vancomycin resistance is acquired when a sensitive *Enterococcus* acquires a **plasmid encoded for vancomycin resistance**; this means that all subsequent generations of this *Enterococcus* are resistant to the antibiotic vancomycin. The new strains are called vancomycin-resistant enterococci (**VRE**).



The antibiotic **VANCOMYCIN** is made by the soil bacterium *Amycolatopsis orientalis* and was first sold in 1954.

Vancomycin is a type of glycopeptide antibiotic considered the last resort for treating serious, life-threatening infections by Gram-positive bacteria which are unresponsive to other antibiotics (e.g., MRSA and *Clostridioides difficile* infection).

It is on the World Health Organization's List of Essential Medicines and is classified as critically important to human medicine.

The emergence of vancomycin-resistant enterococci (VRE) has made strict antibiotic stewardship guidelines essential for the use of vancomycin.



ANTIBIOTIC RESISTANCE

is when bacteria develop the ability to defeat the antibiotics designed to kill them.

It does not mean your body is resistant to antibiotics.

Clinical significance?

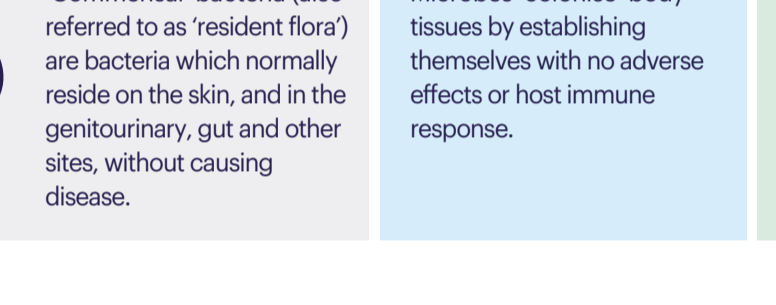
Resistance is based on chromosomal genes, and the production of **extended spectrum beta lactamase enzymes** (also referred to as ESBLs) which inactivate the beta-lactam group of antibiotics (e.g., ampicillin, piperacillin and the cephalosporins).

Treatment with the cephalosporin group of antibiotics is clinically inappropriate - the synergistic use of penicillin with an aminoglycoside (e.g., gentamycin) is recommended for severe infections.

It is recommended that a clinical microbiologist be consulted regarding the options for antimicrobial therapy.

WHO IS AT RISK of developing vancomycin-resistant enterococcal infection (VRE)?

- ✓ People with weakened immune systems such as patients in intensive care units, premature neonates or those in oncology, haematology and organ transplant units
- ✓ Patients who have undergone major procedures such as abdominal or thoracic surgery
- ✓ Hospitalised inpatient with invasive medical devices such as urinary and intravenous catheters
- ✓ Hospitalised patients who have received prolonged treatment with the antibiotic vancomycin or other broad-spectrum antibiotics such as cephalosporins or gentamycin
- ✓ Individuals who are colonised with vancomycin-resistant *Enterococcus* (VRE)



Some people carry VRE in their bowel, nasopharynx or on their skin without it causing symptoms – this is termed colonisation (these individuals do not require antibiotic therapy).

HOW IS VRE SPREAD?

VRE is spread from one person to another through indirect contact with a surface or with patient care equipment contaminated with *Enterococcus faecalis* or *E. faecium*; or directly through person-to-person spread, usually via contaminated hands (it is not spread through the air by coughing or sneezing.)

Clinical significance?

Careful attention must be given to hand hygiene before and after every patient contact. The wearing of gloves and disposable aprons is imperative for any contact with soiled bed linen, wounds, urine, stool or drains to prevent **contact transmission**.

The insertion of all invasive devices should be undertaken using strict aseptic technique, as should the administration of intravenous medication and fluids during the manipulation of central and peripheral lines.

What are commensal bacteria?

'Commensal' bacteria (also referred to as 'resident flora') are bacteria which normally reside on the skin, and in the genitourinary, gut and other sites, without causing disease.

What is the difference between the terms colonisation and infection?

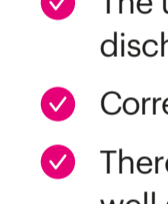
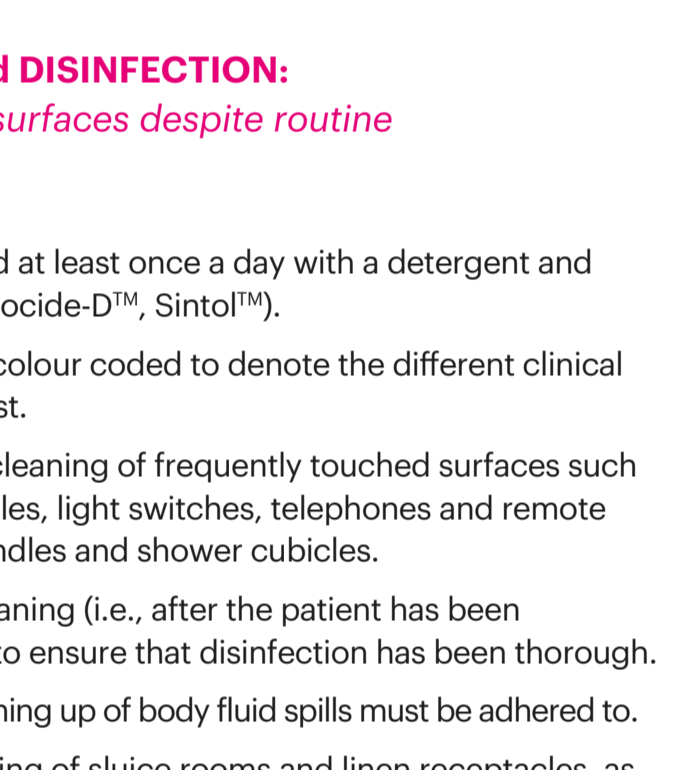
Microbes 'colonise' body tissues by establishing themselves with no adverse effects or host immune response.

What is a facultative microbe?

A 'facultative anaerobe' prefers anaerobic conditions (where oxygen is absent), but will survive in aerobic conditions if necessary.

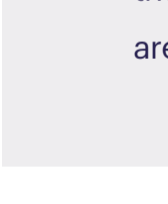
LESSONS LEARNED FOR INFECTION PREVENTION AND CONTROL

- ✓ It is important to understand that **enterococci are most commonly transmitted due to poor hygiene standards and inadequate infection control measures in the healthcare setting.**
- ✓ Isolate **VRE**-infected and colonised patients or cohort them together in the same room.



HAND HYGIENE and STANDARD PRECAUTIONS should be used for every patient contact.

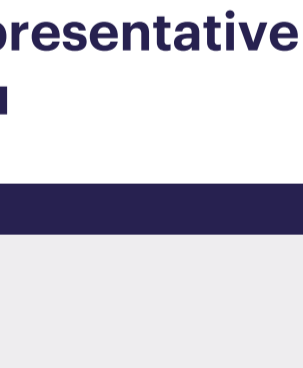
- ✓ Hand-washing with soap and water is indicated when hands are visibly soiled, after contact with blood or other body fluids, after the removal of gloves and after using the toilet.
- ✓ Wet hands should be dried thoroughly with paper towelling.
- ✓ Augment hand hygiene with the frequent application of alcohol-based hand rub.
- ✓ **Any contact with intravenous lines and catheters should be preceded by hand hygiene and aseptic technique used for all procedures.**
- ✓ Personal protective equipment (PPE) such as plastic disposable aprons and gloves should be worn for all contact with urine, faeces and wound fluids.
- ✓ Treat all used linen as contaminated; never carry used linen against the body and keep linen receptacles as close to the work area as possible.
- ✓ Bedpans should NOT be soaked, but rather washed either with a detergent based sodium hypochlorite disinfectant or **preferably, in a bedpan washer at 85°C and stored in an inverted position to drain.**
- ✓ Patient visitors and contractors should also be required to practice hand hygiene upon entering and leaving patient care areas.
- ✓ Ensure patients wash their hands after using the toilet and before eating or drinking.
- ✓ Avoid the shared use of personal hygiene items, such as soaps, washcloths, towels and razors.
- ✓ Deter staff, patients, and visitors from sitting on the beds of other patients.



ENVIRONMENTAL CLEANING and DISINFECTION: Enterococci can remain viable on surfaces despite routine cleaning methods.

- ✓ All patient care surfaces should be damp-dusted at least once a day with a detergent and sodium hypochlorite-based disinfectant (e.g., Biocide-D™, Sintol™).
- ✓ Cleaning cloths and bucket systems should be colour coded to denote the different clinical areas, and isolation rooms should be cleaned last.
- ✓ Careful attention should be paid to the routine cleaning of frequently touched surfaces such as wheelchairs, cot sides, tray tables, door handles, light switches, telephones and remote controls, bathroom basins, toilet seats, flush handles and shower cubicles.
- ✓ The use of supervisor checklists for manual cleaning (i.e., after the patient has been discharged, transferred, etc.) is recommended to ensure that disinfection has been thorough.
- ✓ Correct procedures for the containment and cleaning up of body fluid spills must be adhered to.
- ✓ There should be schedules for the regular cleaning of sluice rooms and linen receptacles, as well as the lids and external surfaces of waste bins, to prevent cross infection.
- ✓ Areas where people congregate such as waiting rooms, restaurants, public toilets and restrooms should be cleaned thoroughly and regularly.
- ✓ All chemical antimicrobial agents used for hand hygiene and surface disinfection should be of hospital grade and approved by the Infection Control Manager.

THE CURRENT SITUATION WITH ANTIMICROBIAL RESISTANCE IS SERIOUS!



Antibiotics form an integral part of the management of high-risk patients, such as the critically ill in intensive care units, children and the elderly, and individuals who are immunosuppressed because of transplantation, chemotherapy or HIV.

To limit resistance, we must find the critical balance between the necessary use of antibiotics as lifesaving medicines and preserving their long-term efficacy by monitoring appropriate usage.

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REFERENCES

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2. US Centers for Disease Control and Prevention (CDC). Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019. Available from www.cdc.gov/DrugResistance/Biggest-Threats.html.
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