WOUND CARE TODAY AND MICROWORLD

IN PARTNERSHIP WITH Mölnlycke®

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WOUND INFECTION

A NEW ANIMATED WAY TO LEARN

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LEARNING OBJECTIVES

At the end of this session, you will be able to:

- Understand the components that make up Microworld
- Understand how Microworld can offer a new animated way to learn and enhanced learning experience
- Understand what wound infection is, the stages of wound infection, how to identify wound infection and the principles of treatment
- Explore Microworld and register.

WHAT IS MICROWORLD?

- Microworld can connect and educate professionals from around the world
- Completing the module:
  - Counts towards revalidation
  - Opens other learning areas of the site
- Complex content delivered through fun, engaging interactive animations, videos, games and illustrations.

CLASS 1 AND 2: WOUND HEALING AND EXUDATE

CHARACTERS

GLUCOSE
(GLUCO)

MACROPHAGE
(MAC / THE CLEANER)

MONOCYTES
(MC)

PLATELETS
(CLOTSWORTH)

PROTEASE ENZYME
(PRO TWINS)

PROTEASE INHIBITORS
(PRO TWINS)

EXUDATE
(MR X)

NEUTROPHIL
(NEWT)

RED BLOOD CELLS
(SCARLET / THE RBCS)

GROWTH FACTORS
(THE CONTROLLER)

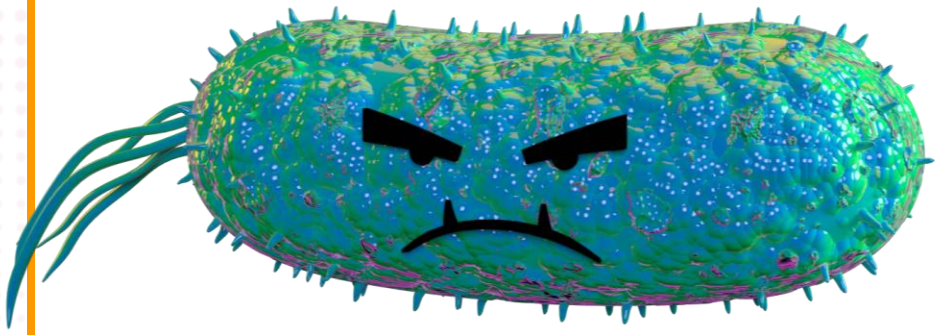
FIBROBLAST / MYOFIBROBLAST

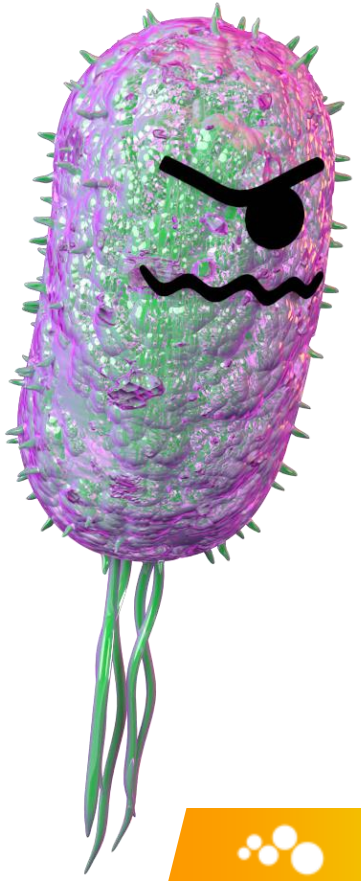
NUTRIENTS & OXYGEN
(YELLOW) (BLUE)

WOUND CARE TODAY

Mölnlycke®

INTRODUCING SOME NEW CHARACTERS





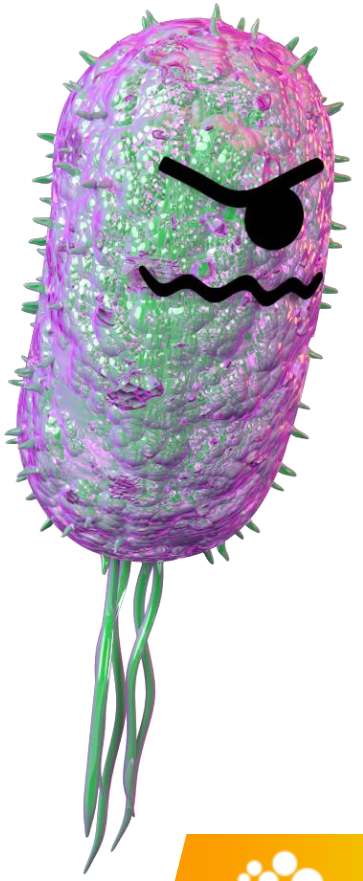
CLASS 3: WOUND INFECTION

This class will take you through:

- What wound infection is
- The stages of wound infection
- How to identify wound infection
- Treatment of wound infection.

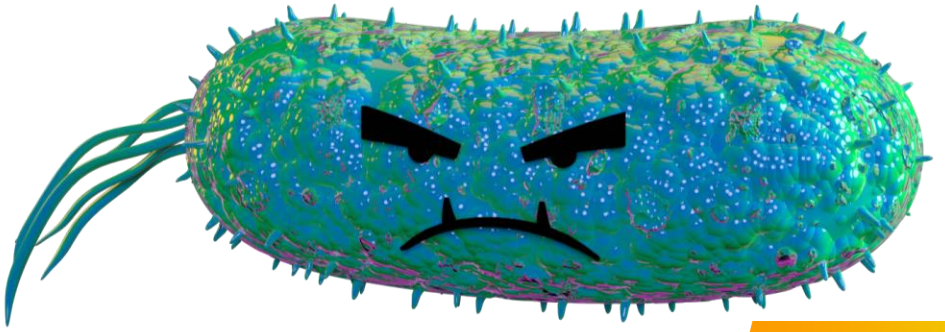
INTRODUCTION

- Wound infection is the invasion of a wound with microorganisms such as bacteria, fungi and yeast
- Most wound infection is caused by one or more species of bacteria
- The effect that bacteria have on the wound is influenced by species of bacteria, their virulence and ability of the patient's immune system to combat them.



INTRODUCTION

- Most common bacteria isolates in chronic wound:
  - *Staphylococcus aureus* – a high toxicity bacteria
  - *Pseudomonas aeruginosa* – can cause biofilm to form
  - Together more virulent than alone
- *Escherichia coli* – one of the leading causes of wound infection.



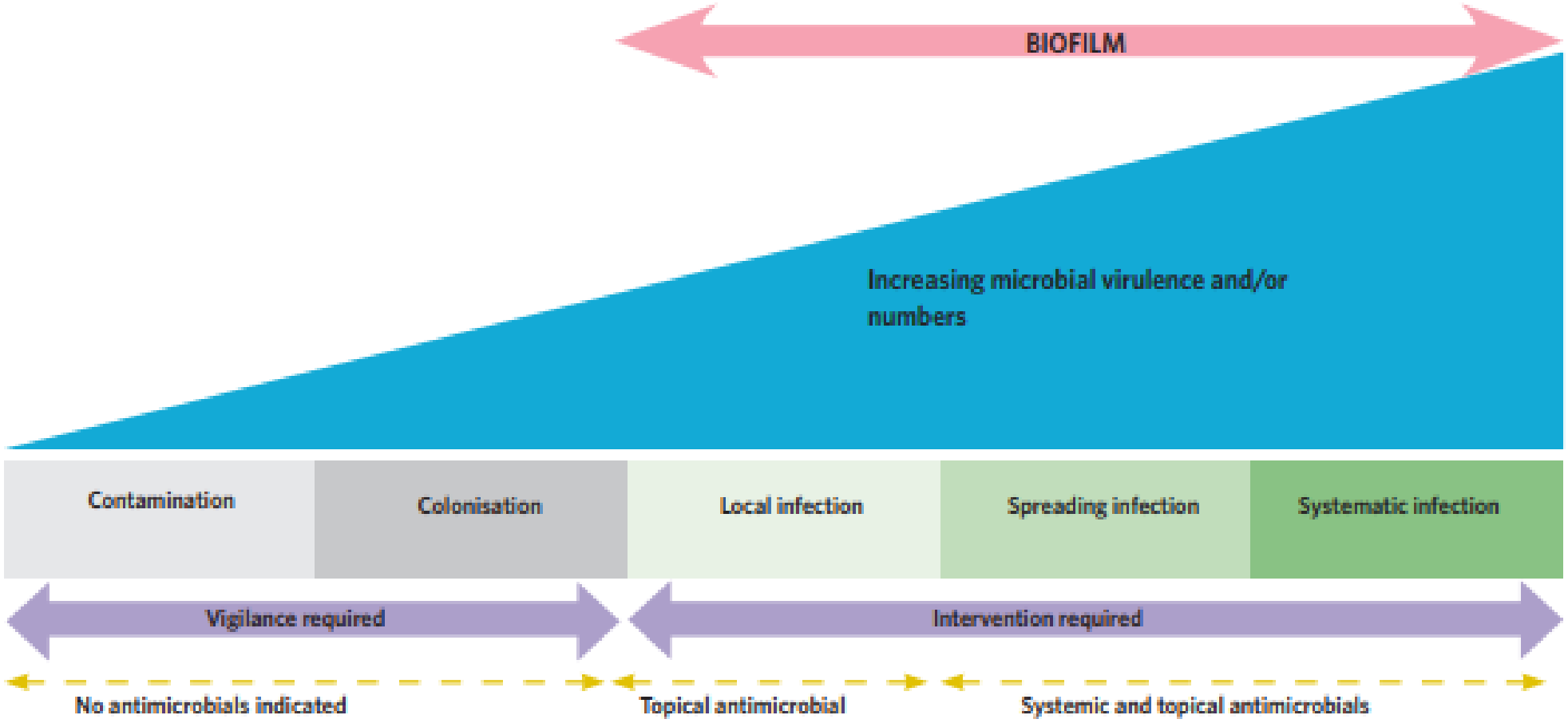
WOUND INFECTION

Wounds can become infected in several ways:

- Direct contact
- Airborne dispersal
- Self-contamination.

The diagnosis of wound infection is a challenging aspect of management. The wound infection continuum was developed to make it easier to understand the stages involved (International Wound Infection Institute [IWII], 2016).

WOUND INFECTION CONTINUUM



WOUND INFECTION CONTINUUM

1.

CONTAMINATION

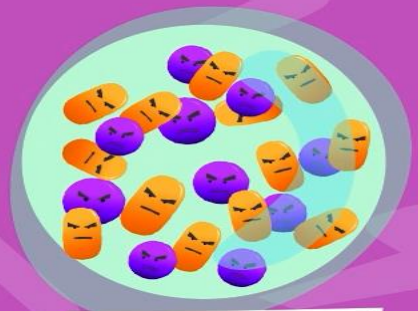
2.

COLONISATION

3.

LOCAL INFECTION

4.



SPREADING INFECTION

5.

SYSTEMIC INFECTION

WOUND INFECTION CONTINUUM

1. Contamination – microbes contaminate the wound
2. Colonisation – microbes increase in number
3. Local infection – microbes increase in number
4. Spreading infection – affected area begins to spread
5. Systemic infection – the body is affected.

POINTS FOR PRACTICE

- In chronic wounds it is important to recognise the difference between the early stages of contamination and colonization, compared to proliferation of microorganisms that result in local, spreading or systemic wound infection
- Generally, colonised chronic wounds will heal uneventfully – no delay to wound healing
- Do not undertake microbiological analysis (e.g. wound swabs) in the absence of an appropriate indication.

RISK FACTORS FOR WOUND INFECTION

Systemic risk factors include:

- Comorbidities, e.g. circulatory/metabolic disorders (diabetes), renal disease, rheumatoid arthritis
- Medication, e.g. immunosuppressants
- Poor nutrition
- Alcohol abuse and smoking
- Age, e.g. neonates and elderly.

(WUWHS, 2008; Butcher, 2013, Swanson et al, 2014)

RISK FACTORS FOR WOUND INFECTION

In chronic wounds, the risk of infection is increased by:

- Presence of devitalised tissue or debris
- Prolonged duration of the wound
- Large and/or deep wounds
- Anatomical site, e.g. near the anal area
- Poor standards of wound hygiene (Jones, 2012).

CLINICAL SIGNS OF INFECTION

Covert signs include:

- Overgranulation tissue or excessive vascular tissue
- Friable, bleeding bright red granulation tissue
- Epithelial bridging or pockets in the granulation tissue
- Further wound breakdown and increase in size
- Delayed wound healing
- Increasing malodour.

CLINICAL SIGNS OF INFECTION

Overt signs include:

- Erythema/redness
- Warmth and swelling
- Purulent discharge/sudden increase in volume of exudate
- New/increased pain.

ACUTE SIGNS OF INFECTION

In acute wounds (e.g. surgical, trauma and burns) there may also be:

- Further extension of the erythema/redness
- Inflammation of the lymph vessels identified by red skin streaks
- Crepitus – a crackling feeling in the local tissue
- Wound breakdown or dehiscence.

CHRONIC SIGNS OF INFECTION

In chronic wounds (e.g. leg ulcers and pressure ulcers) there may be:

- Wound breakdown
- More erythema/redness extending beyond the wound edges
- Crepitus, warmth, induration and discolouration spreading into peri-wound area
- Inflammation of the lymph vessels
- General deterioration in the patient's condition.

SYSTEMIC INFECTION – RED FLAG

It is important to be able to recognise the signs and symptoms of a spreading infection as this will require prompt actior

The signs include (Rutter, 2018):

- Pyrexia
- Tachycardia
- Tachypnoea
- Lethargy/malaise.

POINTS FOR PRACTICE

- Wound infection continuum highlights the potential development of a wound biofilm
- Wound biofilm can impair healing and predispose the wound to an infection
- A holistic wound assessment combining clinical judgement with clinical observations and the ability to risk assess each patient individually will ensure early identification of a wound infection.

CHRONIC WOUNDS AND BIOFILM

- Wound biofilm is a community of microbes that attach themselves to a surface and cover themselves with a substance known as extracellular polymeric substance (EPS) (Atkins et al, 2019)
- This EPS acts as a protective barrier to the host immune response and to antimicrobial activity (IWII, 2016).
- Biofilm can also be difficult to detect without the aid of specialist techniques (Swanson et al, 2015) but there are clinical signs to be aware of.

CHRONIC WOUNDS AND BIOFILM

Indirect clinical signs include:

- Increased volume of exudate
- Poor quality granulation tissue
- Signs of local infection
- History of antibiotic failure
- Culture negative results
- No signs of wound healing.

Biofilm cannot be seen with the naked eye – visual clues include:

- Shiny, translucent substance on the surface of a wound
- Opaque, loosely-attached patches in some parts of the wound
- Viscous, slimy or gel-like substance forming.

(Metcalf et al, 2014).

WOUND INFECTION DIAGNOSIS

- Holistic assessment
- Clinical signs
- Microbiological investigations, blood tests and/or imaging.

POINTS FOR PRACTICE

- If a wound swab is clinically appropriate – take a specimen at and below wound surface using the Levine technique:
  - Cleanse and debride the wound, if necessary, before the swab is taken (don't use antimicrobials)
- Remember, despite being the most widely used technique for microbial monitoring, wound swabs may not distinguish between colonisation and wound infection
- Inappropriate wound swabbing can lead to general misuse of antimicrobial agents and contribute to the increase of antimicrobial resistance.

PRINCIPLES OF TREATMENT

1. Optimise host response
2. Wound management

OPTIMISE HOST RESPONSE

- Address underlying comorbidities to ensure maximum healing potential (IWII, 2016):
  - Optimise glycaemic control in people with diabetes
  - Reduce oedema
  - Reduce pressure in people with pressure ulcers
- Ensure adequate nutritional status
- Provide psychological support to the patients and their carers or family (IWII, 2016).

WOUND MANAGEMENT

- **Local wound infection:** Treatment predominately topical
- **Spreading or systemic:** Systemic treatment alongside topical treatment
- **Wound debridement:** Physical removal of devitalised tissue, debris and disruption of biofilm

WOUND MANAGEMENT

- **Two principal treatment options:**
  - Antimicrobial agents that either kill or inhibit microorganisms (e.g. iodine, silver PHMB and honey)
  - Dressings that adsorb/absorb and retain organisms (e.g. bacterial-binding dressings, absorbent cellulose fibres and super absorbent polymer dressings).

POINTS FOR PRACTICE

- Diagnosis and treatment of wound infection – multidisciplinary approach
- Regular reassessment is very important
- A step-up and step-down approach is advocated to ensure antimicrobial dressings are only used when required
- Treatment of wound infection needs to be assessed over a two to four-week period.

CONCLUSIONS

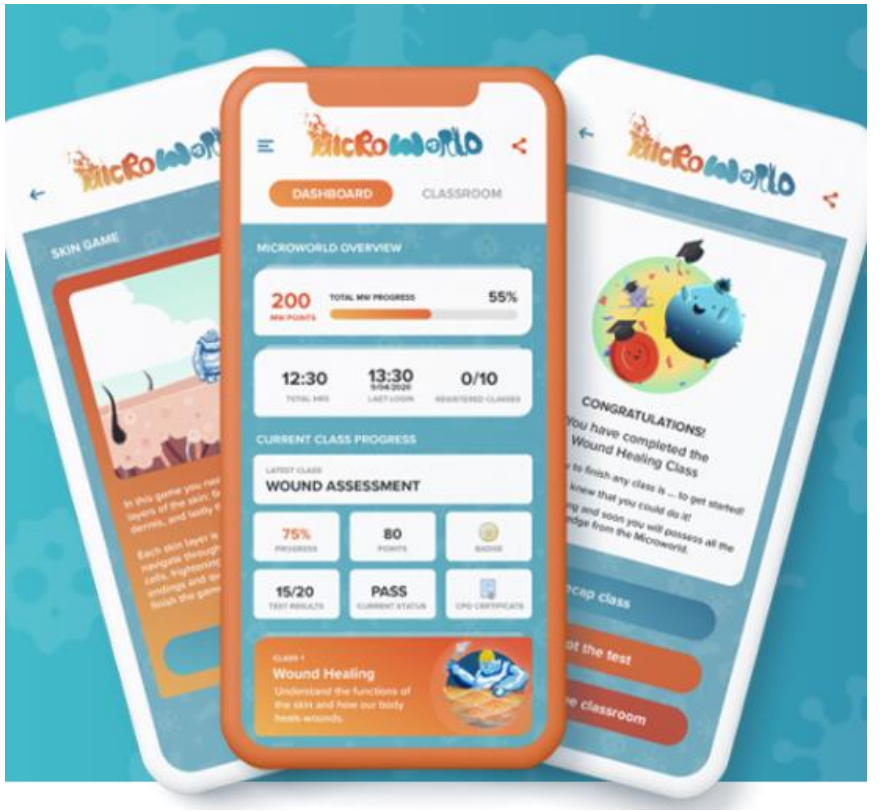
- Wound infection poses a significant challenge to healthcare professionals
- It has a detrimental impact on the quality of life of patients
- Wound biofilm can delay wound healing and increase the risk of wound infection
- Early identification of wound infection begins with a holistic assessment
- Treatment should be regularly reviewed and adapted according to assessment findings.

AT THE END OF THE MODULE

- Repeat and recap on information
- Undertake a test to assess learning
- Monitor progress on the dashboard.

CALL FOR ACTION

- Explore Microworld for free
- Sign up online to start exploring
- Register at Microworld www.mymicroworld.online to undertake the modules.



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WOUND CARE TODAY

LIVE Q&A

SEND IN YOUR QUESTIONS BY COMMENTING ON THE VIDEO

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