Evidence in focus

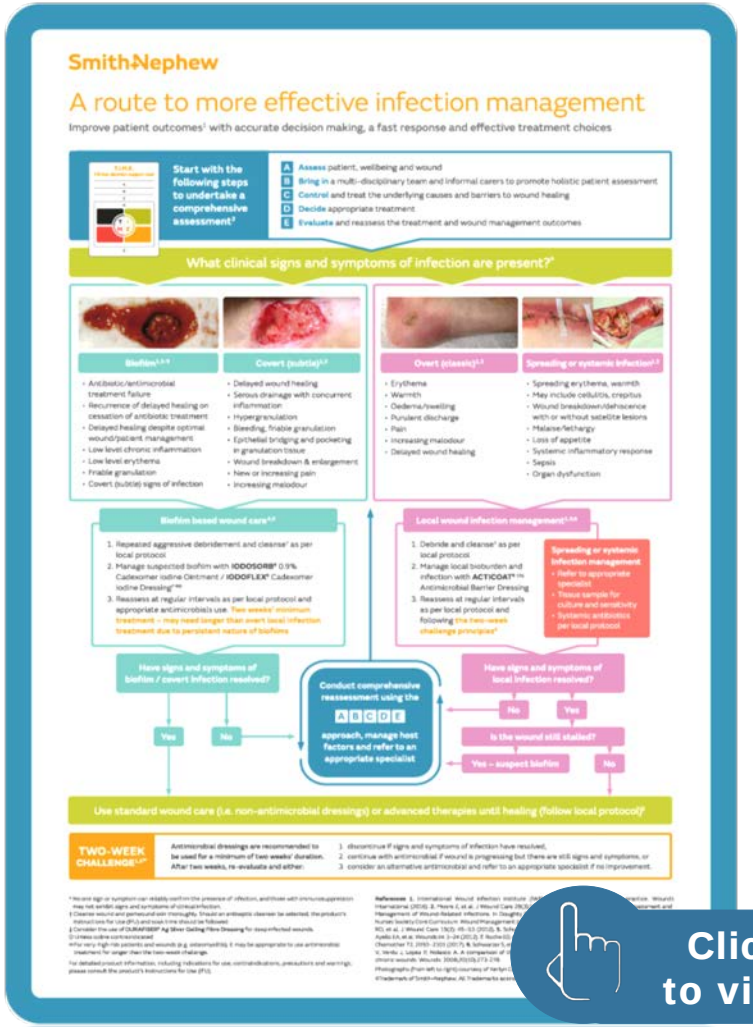
Smith+Nephew

Real world implementation of the infection management (IM) pathway: clinical cases involving management of wounds with biofilm and local infections

What is the infection management pathway?

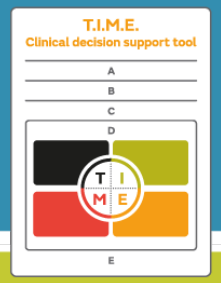
A simple, evidence-based, easy-to-use tool for specialists and non-specialists to help improve patient outcomes by:[1]

- **Simplifying differentiation and diagnosis** of biofilms and local infections
- **Guiding early and appropriate management** and selection of antimicrobials, supporting antimicrobial stewardship
- **Promoting effective and consistent care** among specialists and non-specialists
- **Prompting referral** and facilitating communication among the multidisciplinary team



Helps to identify signs and symptoms of infection[1]

Uses a comprehensive **A B C D E approach** to wound assessment as recommended in the T.I.M.E. clinical decision support tool (CDST) and provides an illustrated guide to the key clinical signs and symptoms of infection[1,2]

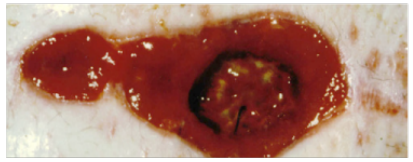


Start with the following steps to undertake a comprehensive assessment[2]

- **A** **Assess** patient, wellbeing and wound
- **B** **Bring in** a multi-disciplinary team and informal carers to promote holistic patient assessment
- **C** **Control** and treat the underlying causes and barriers to wound healing
- **D** **Decide** appropriate treatment
- **E** **Evaluate** and reassess the treatment and wound management outcomes

What clinical signs and symptoms of infection are present?*

Biofilm and covert (subtle) infections

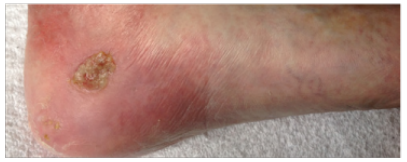


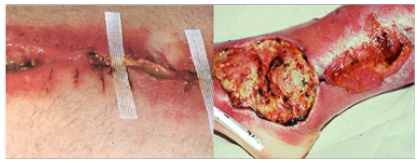
Biofilm[1,3-5]

- Antibiotic/antimicrobial treatment failure
- Recurrence of delayed healing on cessation of antibiotic treatment
- Delayed healing despite optimal wound/patient management
- Low level chronic inflammation
- Low level erythema
- Friable granulation
- Covert (subtle) signs of infection

Covert (subtle)[1,3]

- Delayed wound healing
- Serous drainage with concurrent inflammation
- Hypergranulation
- Bleeding, friable granulation
- Epithelial bridging and pocketing in granulation tissue
- Wound breakdown & enlargement
- New or increasing pain
- Increasing malodour





Overt (classic)[1,3]

- Erythema
- Warmth
- Oedema/swelling
- Purulent discharge
- Pain
- Increasing malodour
- Delayed wound healing

Spreading or systemic infection[1,3]

- Spreading erythema, warmth
- May include cellulitis, crepitus
- Wound breakdown/dehiscence with or without satellite lesions
- Malaise/lethargy
- Loss of appetite
- Systemic inflammatory response
- Sepsis
- Organ dysfunction

Overt (classic) and spreading or systemic infections

Guides appropriate management based on presence of biofilm versus local wound infection[1]

For suspected biofilms:
- Repeated aggressive debridement
- Cleansing per local protocol

Manage with:
IODOSORB◇ 0.9% Cadexomer Iodine Ointment

IODOFLEX◇ 0.9% Cadexomer Iodine Dressing

Biofilm based wound care

1. Repeated aggressive debridement and cleanse as per local protocol
2. Manage suspected biofilm with **IODOSORB◇** 0.9% Cadexomer Iodine Ointment / **IODOFLEX◇** Cadexomer Iodine Dressing
3. Reassess at regular intervals as per local protocol and appropriate antimicrobials use. **Two weeks' minimum treatment – may need longer than overt local infection treatment due to persistent nature of biofilms**

Have signs and symptoms of biofilm / covert infection resolved?

Yes

No

Conduct comprehensive reassessment using the A B C D E approach, manage host factors and refer to an appropriate specialist

Local wound infection management

1. Debride and cleanse as per local protocol
2. Manage local bioburden and infection with **ACTICOAT◇** Antimicrobial Barrier Dressing
3. Reassess at regular intervals as per local protocol and following **the two-week challenge principles**

Spreading or systemic infection management
- Refer to appropriate specialist
- Tissue sample for culture and sensitivity
- Systemic antibiotics per local protocol

Have signs and symptoms of local infection resolved?

No

Yes

Is the wound still stalled?

Yes – suspect biofilm

No

For local infections
- Debridement
- Cleansing per local protocol

Manage with:
ACTICOAT◇ Antimicrobial Barrier Dressing (nanocrystalline silver)

Use standard wound care (i.e. non-antimicrobial dressings) or advanced therapies until healing (follow local protocol)

Please refer to full infection management pathway for supporting references and footnotes

Guides use of antimicrobial dressings and multiple treatment approaches[1]

Use of antimicrobial dressings is recommended for a minimum of two weeks

After two weeks, re-evaluate:

- *Discontinue* if signs and symptoms of infection have resolved
- *Continue* with antimicrobial if wound is progressing but there are still signs and symptoms
- *Consider* an alternative antimicrobial and refer to an appropriate specialist if no improvement

Step down, step up approach

Use of multiple treatment approaches can be scaled down or up depending on how well the infection is responding to treatment and how well wound healing is progressing

Applying the infection management pathway: specific cases

Aim

These case studies demonstrate how the **infection management pathway** can be applied in everyday practice to help guide diagnosis and appropriate treatment for wounds with localised, spreading or systemic infections or those with suspected biofilm

Biofilm-based

Chronic, non-healing pressure ulcer

Local infection

Pressure ulcer (trochanter)

Complex (biofilm and local)

Haematoma (lower leg)

Note:
Some products used in these case studies may not be available in all countries

A chronic non-healing ulcer[5,6]

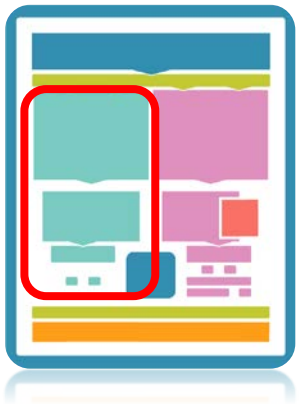
PRESENTATION

- **74-year-old male** referred from ICU with a stalled wound (4 months)
- **Relevant medical history:** Coronary artery disease, diabetes mellitus, hypertension, end-stage renal disease, stroke, anaemia

- **Prior treatments:** Systemic antibiotics for osteomyelitis, local wound dressings of Aquacel™ Ag+ (ConvaTec, Canada) and Mepilex™ (Mölnlycke Health Care, Sweden)
- **Wound dimensions (length, width, depth):** 7.0×6.0×0.4cm

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
Queen's School of Nursing, University of Toronto, Canada

Biofilm: Chronic non-healing ulcer[5,6]



REFER TO INFECTION MANAGEMENT PATHWAY

- Delayed healing despite optimal wound/patient management
- Copious amount of serous drainage, concurrent inflammation
- Hypergranulated
- Bleeding, friable granulation
- Malodorous
- 50% granulating, 50% slough

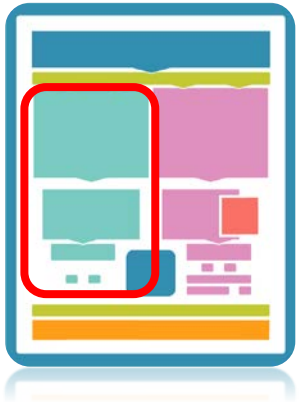
Suspected biofilm

TREATMENT

- **Repeated aggressive debridement**
- **IODOSORB◇ Ointment/Gel**
- **ALLEVYN◇ Gentle Border Dressing**
- **Daily dressing changes** due to high volume of exudate
- **Off loading** with air mattress and positioning

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC** Queen's School of Nursing, University of Toronto, Canada

Biofilm: Chronic non-healing ulcer[5,6]



DAY 7 – REFER TO INFECTION MANAGEMENT PATHWAY

- Cleaner wound bed
- Healthy pink colour
- Non-friable
- Flattening periwound margins
- Highly exudating
- 70% granulating, 30% slough

Suspected biofilm

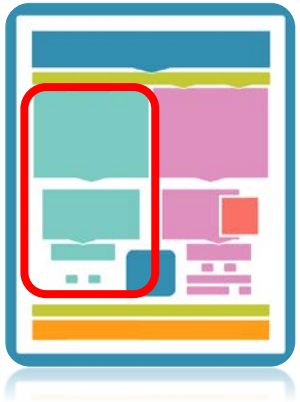
DAY 7 – CHANGE TREATMENT

- Wound dimensions (length, width, depth): **7.0×4.0×0.2cm**

Change to IODOSORB◇ Powder for increased absorbency

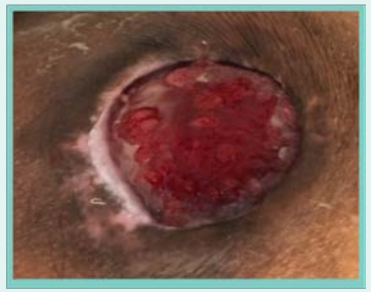
Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
Queen's School of Nursing, University of Toronto, Canada

Biofilm: Chronic non-healing ulcer[5,6]



DAY 13

100% granulation tissue
Wound dimensions (length, width, depth):
6.0×4.0×0.2cm
Continue IODOSORB◇ Powder plus ALLEVYN◇ Gentle Border Dressing



DAY 17

95% granulation tissue,
5% epithelialisation tissue
Wound dimensions (length, width, depth):
6.0×4.0×0.2cm

Positive signs of progression to healing

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
Queen's School of Nursing, University of Toronto, Canada

Pressure ulcer (trochanter area)[5,6]

PRESENTATION

- **75-year-old male with a stalled wound** (>6 months)
- **Relevant medical history:** Parkinson's disease, osteomyelitis, previous treatment for colon cancer, anaemia
- **Prior treatments:** Systemic antibiotics for osteomyelitis, PHMB ribbon and foam dressing
- **Wound dimensions (length, width, depth):** 4.5×4.5×2.0cm

PHMB, polyhexamethylene biguanide

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
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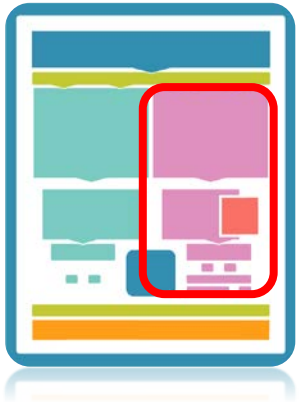
Local infection: Pressure ulcer (trochanter)[5,6]



REFER TO INFECTION MANAGEMENT PATHWAY

- Erythema
- Warmth
- Oedema/swelling
- Purulent discharge, increasingly malodorous
- Pain
- 60% granulating, 40% slough

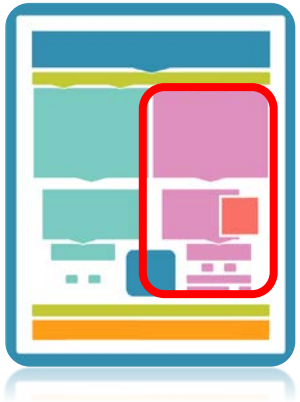
Local wound infection

TREATMENT

- **ACTICOAT◇ FLEX 3 Dressing**
- **ALLEVYN◇ Gentle Border Dressing**
- **Antibiotics** (osteomyelitis) to help prevent sepsis
- **Off loading** with air mattress and positioning

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
Queen's School of Nursing, University of Toronto, Canada

Local infection: Pressure ulcer (trochanter)[5,6]



Positive signs of progression to healing

DAY 7 – RE-ASSESSMENT

- Deeper wound, sloughy tissue reaccumulating
- More (hyper)granulation
- Heavy exudate
- Malodorous
- 70% granulating, 30% slough
- Wound dimensions (length, width, depth): 5.0×4.5×3.0cm

Continue treatment (add analgesia)

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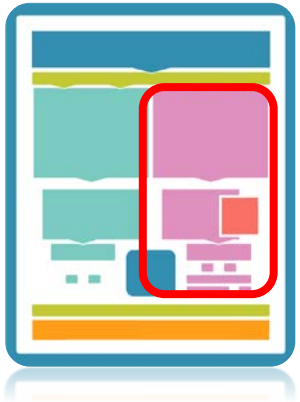
Queen's School of Nursing, University of Toronto, Canada

Local infection: Pressure ulcer (trochanter)[5,6]



Positive signs of progression to healing

DAY 11

Highly exudating, malodorous, pain

90% granulation, 10% slough

Wound dimensions (length, width, depth): **4.8×4.5×3.0cm**

DAY 26

Highly exudating, odour improved, less painful

Wound dimensions (length, width, depth): **3.5×3.5×2.0cm**

DAY 47

Wound dimensions

(length, width, depth): **3.0×3.0×1.5cm**

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Queen's School of Nursing, University of Toronto, Canada

Haematoma (lower leg)[5,6]

PRESENTATION

- 61-year-old female, traumatic wound, lateral gaiter area (left leg) 5 days post injury. Referred to acute facility with suspected compartment syndrome and Fournier gangrene
- **Relevant medical history:** Diabetes mellitus, lymphoedema
- **Wound dimensions (length, width, depth):** 7.0×6.0×0.4cm

11 DAYS AFTER PRESENTATION

- **Wound dimensions after debridement (length, width):** 20×10cm

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
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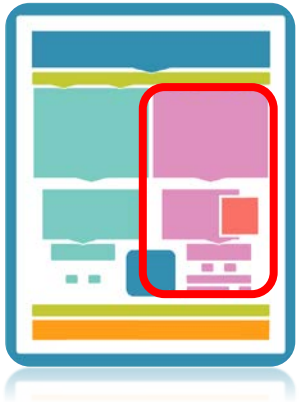
Complex (mixed) infection: Haematoma (lower leg)[5,6]



Treatment approach **before** formal referral to the infection management pathway

TREATMENT (DAY 6)

Daily enzymatic debridement with antimicrobial dressing

Wound dimensions (length, width): 25x17cm

DAY 12

Continued daily enzymatic debridement with antimicrobial dressing

Wound dimensions (length, width): 24x15cm

DAY 13

Continued daily enzymatic debridement with antimicrobial dressing

Wound dimensions (length, width): 24x15cm

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC**
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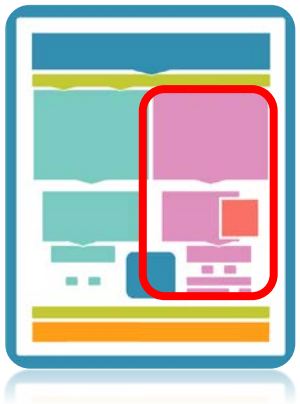
Complex (mixed) infection: Haematoma (lower leg)[5,6]



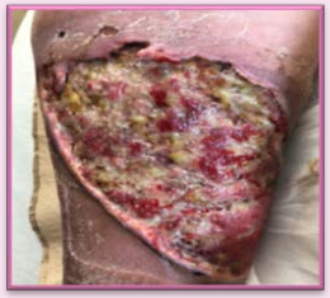
REFER INFECTION MANAGEMENT PATHWAY

- Erythema
- Warmth
- Oedema/swelling
- Purulent discharge, increasing malodour, friable tissue
- Pain
- Delayed wound healing

Local wound infection

DAY 15

- **ACTICOAT◇ FLEX 3 Dressing**
- **ALLEVYN◇ LIFE Foam Dressing**
- 25% granulating, 75% slough
- Wound dimensions (length, width): 24×15cm



DAY 21

- 30% granulation, 40% slough, 30% necrotic tissue
- Wound dimensions (length, width): 24×15cm

Improvement in local infection, wound healing stalled

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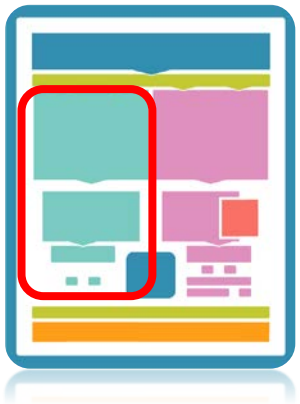
Complex (mixed) infection: Haematoma (lower leg)[5,6]



REFER INFECTION MANAGEMENT PATHWAY

- Delayed wound healing
- Serous drainage with concurrent inflammation
- Friable hypergranulation
- Wound breakdown and enlargement
- Increasing pain and malodour

Suspect biofilm

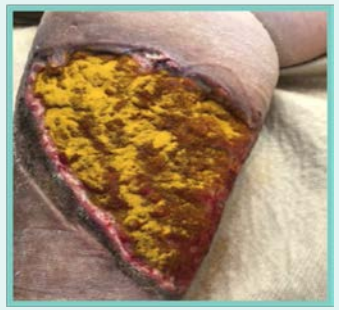
DAY 21

- **Aggressive debridement**
- **IODOSORB◇ Powder, ALLEVYN LIFE Foam Dressing, compression**
- Wound dimensions (length, width): 24x15cm

DAY 38 (ASSESSED AT DAYS 28 & 35)

- Wound dimensions (length, width): 21x13cm (Day 28: 23.5x14cm; Day 35: 22x13.5cm)

Day 35



Day 38

Positive signs of progression to healing

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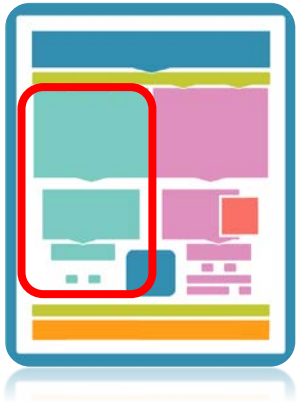
Complex (mixed) infection: Haematoma (lower leg)[5,6]



Step down, step up
(transitions between multiple therapies and standard of care)[4]

DAY 43 – RE-ASSESSMENT

- **Signs and symptoms of biofilm resolved**
- **STEP UP** treatment with **PICO◇ Single Use Negative Pressure Wound Therapy System** (2 weeks)
- 80% granulation, 20% slough
- Wound dimensions (length, width): 20x12cm

DAY 64

- **STEP DOWN** treatment to **standard wound care, foam dressings**
- 95% granulation tissue, 5% yellow fibrin
- Wound dimensions (length, width): 18x10cm

Provided courtesy of: **Kevin Woo, PhD, RN, FAPWCA, WOCC** Queen's School of Nursing, University of Toronto, Canada

Learnings from pathway implementation[5,6]

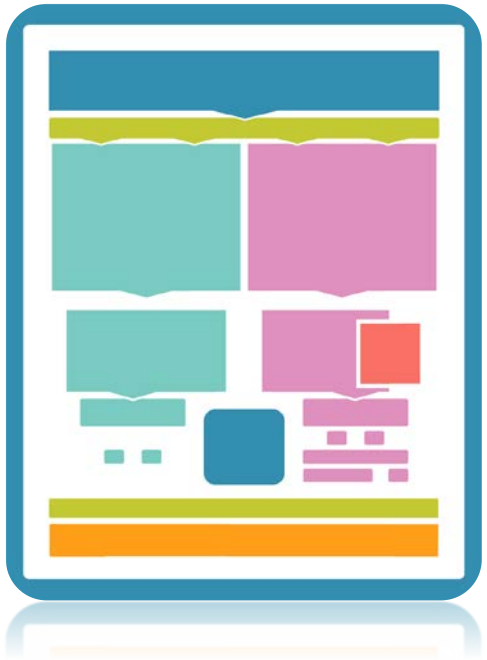
Guided differentiation between local infection and biofilm

Simplified dressing selection

Facilitated communication between clinicians

Improved understanding of the different management approaches to **local infection** and **biofilm**

Eased decision making



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