



Complex / Hard to heal wounds

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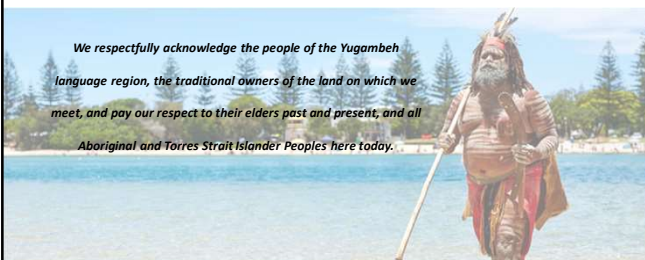
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Acknowledgement of Country



We respectfully acknowledge the people of the Yugambah language region, the traditional owners of the land on which we meet, and pay our respect to their elders past and present, and all Aboriginal and Torres Strait Islander Peoples here today.

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Learning Objectives

Participation in this webinar will enable you to:

- Identify why some wounds are hard-to-heal
- Recognise factors affecting wound progression
- Examine the relationship between hard-to-heal wounds and biofilm
- Identify clinical features of a non-healing wound
- Determine principles of management for hard-to-heal wounds
- Identify escalation criteria

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Hard-to-heal wound

Key term

A wound that has failed to respond to evidence-based standard of care. The concept of wound hygiene is based on the premise that all hard-to-heal wounds contain biofilm. Because of the speed with which wound biofilm forms, a wound that exhibits exudate, slough and an increase in size by the third day of its occurrence may already be defined as hard-to-heal.

(Murphy, Atkin, Seawson, Tach, Tai, & Vega de Ciego et al., 2020)
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Factors affecting wound progression

Patient-related factors

Wound-related factors


Skill & knowledge of health professional

Resources


Treatment-related factors

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 **Patient-related physical factors**

- Wound aetiology
- Comorbid conditions
- Allergies & sensitivities
- Mediations
- Pain
- Social factors




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 **Patient-related psychosocial factors**

- Social isolation
- Gender
- Socio-economic status
- Pain, stress & depression
- Coping mechanisms
- Patient beliefs
- Concordance
 - Lack of control over wound healing
 - Patient 'expert'
 - 'Blunting' unconcerned about treatment & not interested in progress



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 **Wound-related factors**

- Wound size & depth
- Wound duration
- Reduced blood supply
- Anatomical location
- Condition of wound bed
- Wound infection




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 **Skills, knowledge & attitudes**

- Expectations of wound healing



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 **Resource & treatment related factors**

- Technology
- Education
- Protocols & formularies
- Financial burden



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 **Causes of non-healing**

- Most leg ulcers are caused by:
 - Venous insufficiency 45 - 60%
 - Arterial insufficiency 10 - 20%
 - Diabetes 15 - 25%
 - Combination of these factors 10 - 15%
 - Rare underlying disorders



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Causes of non-healing

- Vascular (venous, arterial, lymphatic, vasculitis)
- Neuropathic (diabetes, spina bifida, leprosy)
- Metabolic (gout, diabetes)
- Connective tissue disease (rheumatoid arthritis, scleroderma, systemic lupus erythematosus)
- Pyoderma gangrenosum (reflective of systemic disorder)
- Haematological disease (red blood cell disorder e.g. sickle cell disease; white blood cell disorder e.g. leukaemia; platelet disorders e.g. thrombocytosis)
- Dysproteinaemias (cryoglobulinaemia, amyloidosis)
- Immunodeficiency (HIV)
- Neoplastic (BCC, SCC, metastatic disease)
- Infectious (fungal, bacterial, viral)
- Panniculitis (necrobiosis lipoidica)
- Traumatic (pressure ulcer, radiation damage)
- Iatrogenic (drugs)
- Factitious (self-harm, dermatitis artefacta)
- Other (sarcoidosis)

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Complications

Sinus formation	Fistula	Unrecognised malignancy	Malignant transformation
Osteomyelitis	Contractures/ deformity	Drug resistance	Septicaemia

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Clinical features of hard-to-heal wounds

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Clinical features of hard-to-heal wounds

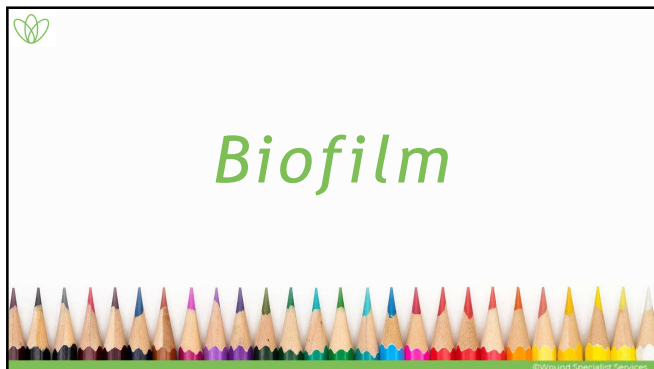
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Clinical features of hard-to-heal wounds

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Clinical features of non-healing wounds

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Wound Bed Preparation (WBP)

- Tissue:** removal of non-viable tissue or replacement of deficient tissue
- Infection:** control of infection or inflammation
- Moisture imbalance:** correction of excessive moisture and prevention of desiccation
- Edge:** revision of the edge of the wound to stimulate healing

(Sibbald et al., 2021; European Wound Management Association, 2004)

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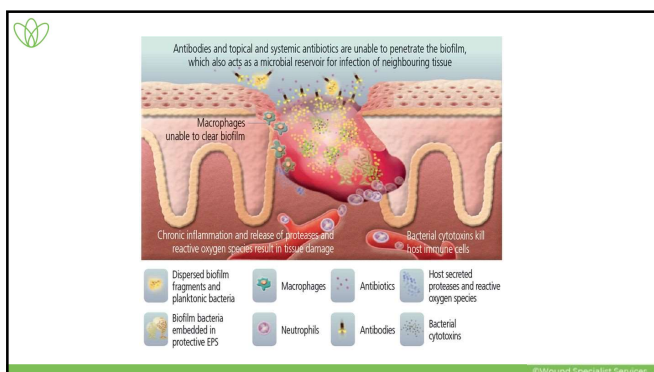
Wound biofilm

Key term

A complex community of different species of bacteria and fungi that causes a sustained subclinical wound infection, but can protect itself from the host's immune response and is tolerant to antibiotics and antiseptics.²⁴ Biofilm can form within hours and can reach maturity in 48–72 hours²⁶ (Figure 2).

(Murphy, Atkin, Swanson, Tach, Tan, & Vega de Canga et al., 2020)

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78% of wounds have biofilm

Primary cause of non-healing

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What does it look like?


Invisible to the naked eye

Clinical signs:

- Inflammation
- Slough or gelatinous appearance
- Elevated levels of exudate & MMPs
- Failure to heal at expected rate despite optimal care

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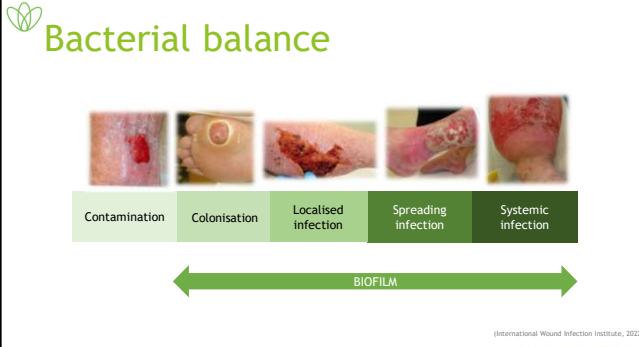


Clinical indicators of biofilm

- Failure of appropriate antibiotic treatment
- Recalcitrance to appropriate antimicrobial treatment
- Recurrence of delayed healing on cessation of antibiotic treatment
- Delayed healing despite optimal wound & health support
- Increased exudate
- Low level chronic inflammation
- Low level erythema
- Poor or friable granulation tissue
- Secondary signs of infection

(International Wound Infection Institute, 2022)
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Bacterial balance

Contamination → Colonisation → Localised infection → Spreading infection → Systemic infection

BIOFILM

(International Wound Infection Institute, 2022)
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Symptoms of Local Infection

- New, increased or altered pain
- Delayed wound healing
- Hypergranulation
- Periwound oedema
- Bleeding or friable granulation tissue
- Distinctive malodour or change in odour
- Wound bed discolouration
- Increased or altered/purulent exudate
- Induration
- Pocketing
- Bridging
- Erythema
- Local warmth

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Symptoms of Spreading Infection

As for localised plus:

- Wound breakdown
- Erythema >2cm extending from wound edge
- Crepitus, warmth, induration or discolouration spreading into periwound area
- Lymphangitis
- Malaise or other non-specific deterioration in patient's general health
- Loss of appetite
- Sepsis
- Septic shock
- Organ failure
- Death

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Symptoms of wound infection

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Diagnosis of infection




What's the best way to take a wound culture?

Only collect a wound sample if there are clinical signs & symptoms of wound infection



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Wound hygiene




- 01 Cleanse the wound and periwound skin**
Cleanse the wound bed to remove devitalised tissue, debris and biofilm. Cleanse the periwound skin to remove dead skin scales and callus, and to decontaminate it
- 02 Debride**
Remove necrotic tissue, slough, debris and biofilm at every dressing change
- 03 Refashion the wound edges**
Remove necrotic, crusty and/or overhanging wound edges that may be harbouring biofilm. Ensure the skin edges align with the wound bed to facilitate epithelial advancement and wound contraction
- 04 Dress the wound**
Address residual biofilm while preventing or delaying regrowth of biofilm by using dressings containing antibiotics and/or antiseptical agents

(Murphy, Atkin, Swanson, Tachi, Tan, & Vinga de Canga et al., 2020)

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01 Cleanse the wound and periwound skin


Cleanse the wound bed to remove devitalised tissue, debris and biofilm. Cleanse the periwound skin to remove dead skin scales and callus, and to decontaminate it



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02 Debride

Remove necrotic tissue, slough, debris and biofilm at every dressing change



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Methods of debridement

- Surgical debridement
- Conservative sharp wound debridement (CSWD)
- Dressings / autolytic debridement
- Mechanical debridement
- Biological debridement
- Chemical / enzymatic debridement

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03 Refashion the wound edges

Remove necrotic, crusty and/or overhanging wound edges that may be harbouring biofilm. Ensure the skin edges align with the wound bed to facilitate epithelial advancement and wound contraction



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Dress the wound


Address residual biofilm while preventing or delaying regrowth of biofilm by using dressings containing antibiofilm and/or antimicrobial agents

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Practical Activity

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Wound hygiene checklist

- Holistic assessment of the patient, wound & environment
- Implement pain management as needed
- Cleanse the periwound skin
- Cleanse the wound bed
- Debridement
- Cleanse the wound before and after debridement
- Refashion the wound edges
- Select an appropriate dressing
- When in doubt - refer!

(Murphy, Allen, Swanson, Tachi, Tan, & Vega de Cienega et al., 2020)

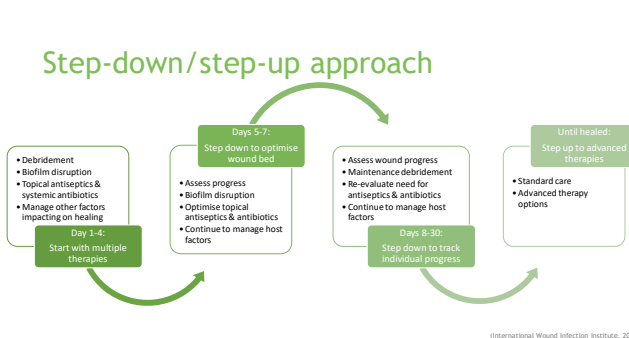
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Step down/step-up biofilm based wound care

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Step-down/step-up approach



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    graph LR
      A[Day 1-4: Start with multiple therapies  
• Debridement  
• Biofilm disruption  
• Topical antiseptics & systemic antibiotics  
• Manage other factors impacting on healing] --> B[Days 5-7: Step down to optimise wound bed  
• Assess progress  
• Biofilm disruption  
• Optimise topical antiseptics & antibiotics  
• Continue to manage host factors]
      B --> C[Days 8-30: Step down to track individual progress  
• Assess wound progress  
• Maintenance debridement  
• Re-evaluate need for antiseptics & antibiotics  
• Continue to manage host factors]
      C --> D[Until healed: Step up to advanced therapies  
• Standard care  
• Advanced therapy options]
    
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(International Wound Infection Institute, 2022)

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Things to Think About

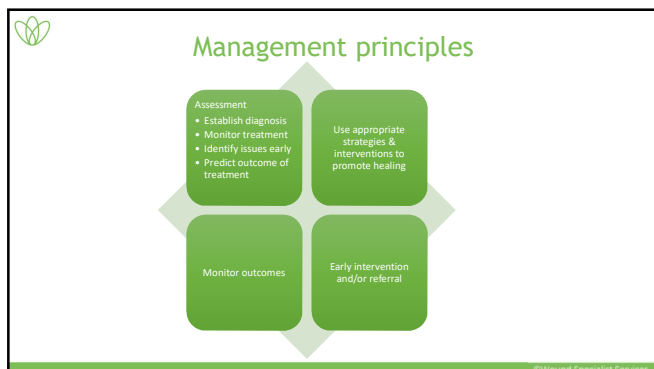
How long do you use a topical antiseptic?

2-week challenge

Use product for at least 2 weeks & then re-evaluate
Treatment may be required for up to 4 weeks

(International Wound Infection Institute, 2022)

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Management strategies

Review and correct (if possible) factors that may impede healing:

- Assess & correct causes of tissue damage
- Ensure adequate blood supply
- Assess & monitor wound history & characteristics
- Know when to refer

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Summary

- It is important to recognise, understand & address the factors that contribute to wound complexity
- Assess the person and their wound to identify when a wound is likely to be slow or hard to heal
- Target interventions at reducing complexity including factors related to the patient, the wound, the health care professional & available resources
- Know when to refer

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Morning Tea & Trade Display

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Practical Activity

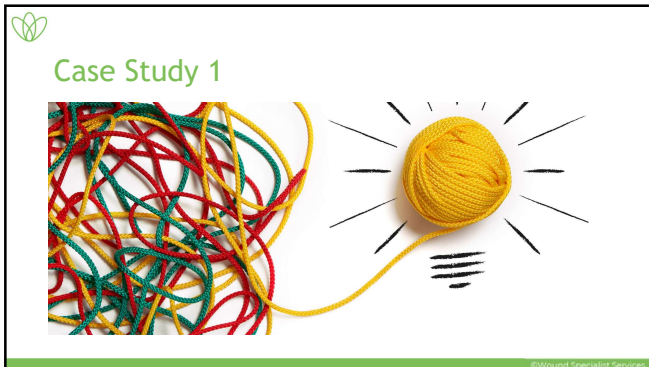
1. Assess the wound
2. List the features that might indicate the wound is hard-to-heal
3. Visit the trade displays to find dressings you could use

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Practical Activity

1. Stage 3 Pressure Injury
2. Suture line
3. Stage 3 Pressure Injury
4. Unstageable Pressure Injury
5. Dehiscid suture line
6. Mixed venous & arterial leg ulcer

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Past health history

<p>Medical / Surgical History</p> <ul style="list-style-type: none"> • Heart failure • Mitral valve regurgitation • Tricuspid regurgitation • Atrial fibrillation • Iron deficiency anaemia • Cataracts & IOL • Hearing impaired • Diverticulosis sigmoid colon • Basal cell carcinoma EOL & SSG R/foot 	<p>Allergies/Sensitivities</p> <ul style="list-style-type: none"> • Amoxicillin • Cephalixin • Clindamycin • Escitalopram <p>Social History</p> <ul style="list-style-type: none"> • Ambulates with 4WW • Home care 3/wk, community nurses 3/wk • Independent with ADLs • Carer for husband with cognitive impairment & significant health issues
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<h3>Medications</h3> <ul style="list-style-type: none"> • Furosemide • Pantoprazole • Vitamin D • Bisoprolol • Dapagliflozin • Spironolactone • Potassium (Span-K) • Warfarin • Denosumab • Movicol • Paracetamol • Vitamin B12 	<h3>Investigations</h3> <p>Arterial & venous duplex ultrasound - biphasic flow</p>
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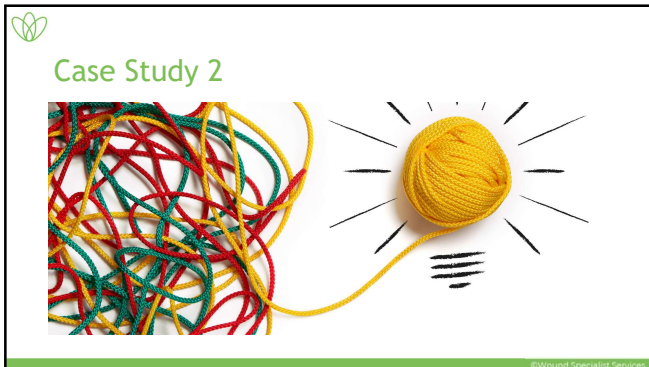
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Past health history

<p>Medical / Surgical History</p> <ul style="list-style-type: none"> • Korsakoff's syndrome • Alzheimer's disease • Psychological & behavioural symptoms of dementia • Cerebrovascular accident • Fractured L) acetabulum • Hypertension • Ischaemic heart disease • Epilepsy • Depression 	<p>Allergies/Sensitivities</p> <ul style="list-style-type: none"> • Zyprexa • Pineapple • Mango <p>Social History</p> <ul style="list-style-type: none"> • Admitted to RACF approx. 2 months ago from hospital after CVA • ETOH, nicotine & marijuana misuse
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Wound assessment on admission




Right hip
1 July



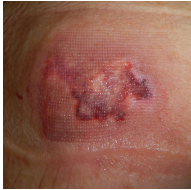
Left hip
1 July

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Wound Progression



Right hip
13 July



Left hip
13 July

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Wound Progression



Right hip
28 July



Left hip
28 July

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Wound Progression

Right hip
28 August

Left hip
28 August

Coccyx
28 August

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Wound Management Plan

- Implement pressure injury prevention & management plan
- Skin & wound hygiene
- Wound dressing plan
- Referrals

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Evaluation Plan / Outcome

- Set treatment goals
- Aim for improvement within 2 weeks
- Reassess every 2 weeks to monitor progress
- Nutrition & hydration
- Repositioning & mobilisation

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Referral to a specialist is needed when:

- No signs of improvement within 2 weeks despite best practice
- Uncertainty in diagnosis
- Complicated wounds
- Signs of infection not responding to antimicrobial therapy
- Wound can be probed to bone
- Wound deteriorates or new ulcers occur
- The wound appears ischaemic
- Benefit from surgical intervention
- Symptoms limit lifestyle & quality of life
- Beyond your practice scope or just not sure what do

We're here to help!

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Referral Process

- 1 Book appointment
P: 07 3289 3102
E: info@woundservice.com.au
W: www.woundservice.com.au
- 2 Email or upload resident files
• Patient Intake Form
• Medication & Health Summary
• Wound photo(s)
- 3 Appointment confirmed
- 4 Connect to consult
- 5 After the consult

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Questions

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info@woundservice.com.au
P: 07 3289 3102
www.woundservice.com.au

Scan the QR code to complete evaluation

Next workshop: Friday 6 September
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