Speakers

- Dr Stephen Yelland

- Nicola Morley NP

Wound Management Training for GPs

9:00am
- Introduction and welcome

9.05am Dr Andrew Jones (Infectious Diseases Physician)
- Wound Infection

9.50am Dr Mark Jackson (Vascular Surgeon)
- Vascular Wounds of the lower limb

11.20am Morning Tea

11.50am Dr Jessica Triay (Endocrinologist)
- Optimising Diabetic Management to reduce risk of foot wounds

12.30pm Dr Stephen Yelland & Nicola Morley
- Impact of wounds, healing process, patient and wound assessment

1.15pm Lunch and trade display

1.55pm Dr Stephen Yelland & Nicola Morley
- Wound products wound dressing procedures
- Skin tears and Blisters

3.15pm Oedema Mgt / Nicola Demonstrating L & R Wrap / Coban
- Compression Therapy Workshop

4.15pm
- Summary and evaluation

4:30pm
- Close

GOALS & OUTCOMES

- Specialist services for Chronic wounds & referral pathway
- Determine aetiology chronic wound
- GP Mgt plan with complex wound with infection or oedema
- EBP for DFU + offloading
- Investigations PAD in GP Practice + ABPI

Dr Andrew Jones

Dr Andrew Jones (Infectious Disease Specialist)

Name

Dr Andrew Russell Reece Jones

Qualifications

Bachelor of Medicine / Bachelor of Surgery University of London United Kingdom 1985

FRACP 1989

FRCPA

Occupation

Infectious Disease Specialist

Microbiologist

Gender

Male

Medical Specialties

Microbiology

Infectious Disease

Hospital Affiliations

Pindara Private Hospital

Gold Coast Private Hospital

Affiliated Organisations

The Royal Australasian College of Physicians (RACP)

Royal College of Pathologists of Australasia (RCPA)

Topics

Medical Microbiology

Infectious Diseases

Dr Mark Jackson

Mark Jackson

Vascular Surgery

Suite 6 Lvl 2, Gold Coast Surgery Centre 103
Nerang St
SOUTHPORT, QLD

College of Surgeons

An experienced vascular surgeon, fully trained in open and endovascular (minimally invasive) surgical techniques. Dr Jackson has appointments at Gold Coast University & Gold Coast Private hospitals, The Tweed Hospital, Toowoomba Base Hospital, Pindara and John Flynn Private hospitals. Dr Jackson also offers a broad range of venous therapies including ultrasound, sclerotherapy, thermal ablation and surgical techniques. Dr Jackson is an enthusiatic researcher including the areas of the management of peripheral arterial disease and in teaching & assessment of Vascular surgical trainees throughout Australia and New Zealand. He has been appointed Associate Professor at Griffith University Medical School.

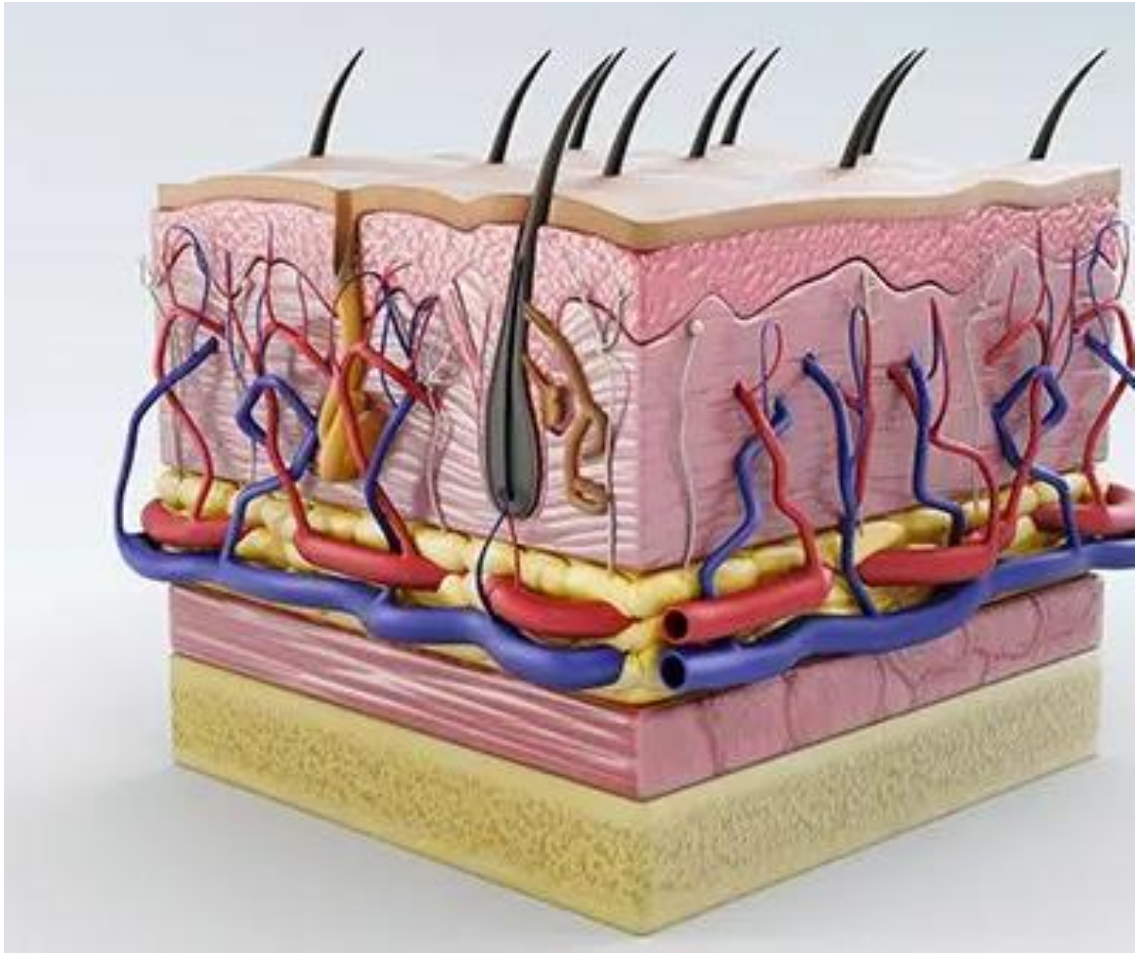
Dr Jessica Triay (Endocrinologist)

- Diabetes: including Type 1 Diabetes, Type 2 Diabetes, Diabetes in Pregnancy, insulin pump therapy Thyroid disease Parathyroid disease Adrenal disease Pituitary disease Osteoporosis Testicular insufficiency (and assessment for replacement)

The Test

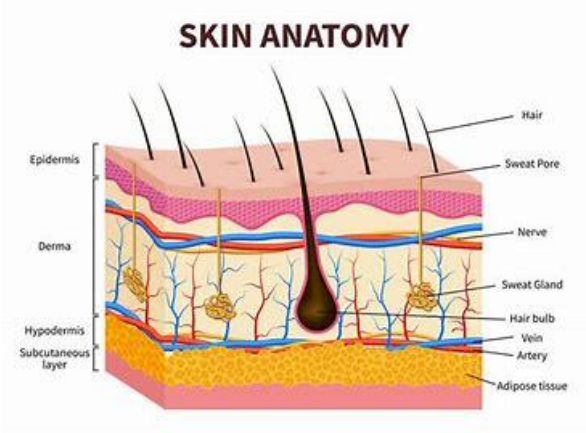
1) Name the 7 layers of the skin

1. Stratum C……
2. Stratum L…….
3. Stratum G……
4. Stratum S……
5. Stratum B……
6. P…… layer
7. R ……. layer



2). A 1cm x 1cm piece of skin in forearm has

1.	A) 100000	B) 200000	C) 300000	EPIDERMAL CELLS
2.	A) 1.7	B) 2.7	C) 3.7	METRES OF NERVE
3.	A) 0.9	B) 1.5	C) 2.2	METERS OF BLOOD VESSELS
4.	A) 5	B) 10	C) 15	SEBACEOUS GLANDS
5.	A) 50	B) 100	C) 150	SWEAT GLANDS

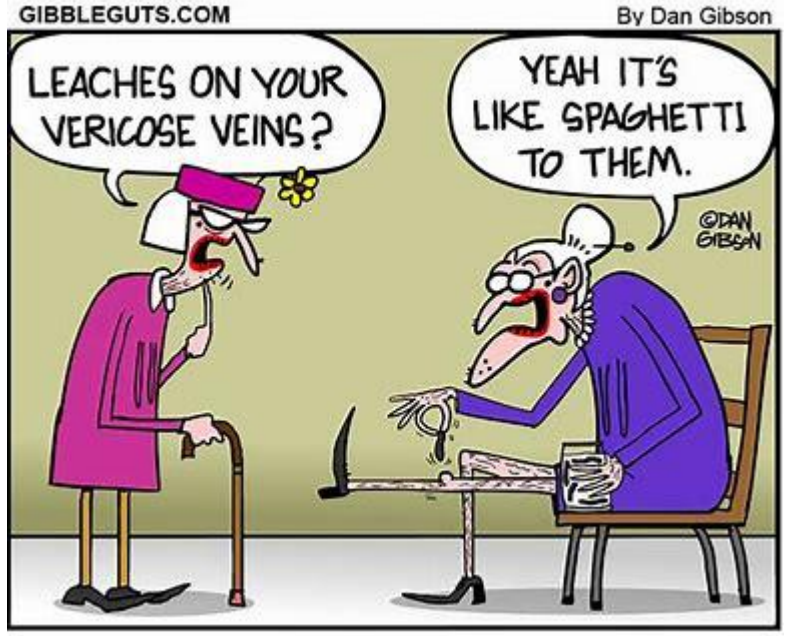


3). Which of the following characterises the appearance of a venous leg ulcer

A. SHALLOW WITH REGULAR MARGINS
B. SHALOW WITH IRREGULAR WOUND MARGINS
C. DEEP WITH REGULAR WOUND MARGINS
D. DEEP WITH IRREGULAR WOUND MARGINS

4. WHICH OF THE FOLLOWING IS CONSIDERED THE "GOLD STANDARD" TO TREAT VENOUS LEG ULCERS?

A. ALGINATE DRESSINGS
B. ELEVATION
C. ANTIMICROBIALS
D. COMPRESSION THERAPY
E. RADIOFREQUENCY ABLATION



5. What is not appropriate for managing a venous leg ulcer?

A. Elevate limb
B. Arterial duplex scan
C. Compression
D. Regular exercise
E. Antimicrobial dressings
F. Moisturisation

6) WHAT IS NOT A PHASE OF WOUND HEALING?

A) MATURATION
B) HAEMOSTASIS
C) INFECTION
D) INFLAMMATION
E) PROLIFERATION

7) MR D is experiencing WHAT KIND OF EXUDATE FROM HIS WOUND IF IT appears clear

- A) SEROUS
- B) SANGUINEOUS
- C) SEROSANGUINEOUS
- D) PURULENT

8) WHAT DOES THE ACRONYM “T.I.M.E.R.S” STAND FOR?

A) TISSUE, IMPROVEMENT, MANAGEMENT, EDUCATION, REPAIR, SALVAGE

B) TISSUE, INFECTION / INFLAMMATION, MOISTURE CONTROL, EDGE MIGRATION, REGENERATION, SOCIAL FACTORS

C) THERAPY, INFECTION / INFLAMMATION, MOISTURE CONTROL, EDUCATION, REMODEL, SOCIAL FACTORS

D) THERAPY, IMPROVEMENT, MANAGEMENT, EDGE MIGRATION, RENEWAL, SALVAGE

9) WHICH OF THESE WOULD YOU DEEM TO BE VENOUS?

A)

B)

C)

D)

10) An Atypical Wound may be suspected if ?

A) The wound has rapidly increased in size in a short period
B) The wound is extremely painful
C) The wound has an abnormal location
D) The wound has not healed with good treatment within 16 weeks
E) All of the above

11) WHICH OF THESE WOULD YOU NOT ADMIT TO HOSPITAL?

A)

b)

C)

D)

12) WHICH OF THE FOLLOWING IS NOT IMORTANT IN MANAGING THIS WOUND ?

- A) CALLUS REMOVAL
- B) OFFLOADING FOOTWEAR
- C) VENOUS DUPLEX SCAN
- D) PODIATRIST
- E) BGL MONITORING

13) NAME THE PULSES ?

A…… b…… c…… d……

14) COBAN FULL applies 40mmhg compression ?

- A) TRUE
- B) FALSE

THE END OF PRE-TEST

Referral Templates

- Referral templates can be found on the GCPHN website: **gcphn.org.au website**

- Complex Wound Clinic | Bundall Medical Centre

- Wound clinic GCUH; Smart Referrals
- Smartreferralsgc@health.qld.gov.au
- Fax 07 5687 4497

- Vascular NP Nicola Morley / Emma Sproule
- Complex Wound / Plastics & Pressure Jodie Perry
- High Risk Foot Clinic (Tugun / Tweed / Robina / GCUH)

- GCUHWound.Care@health.qld.gov.au

Chronic Disease Management Information and Resources

Resources available on the GCPHN website

The Impact of Chronic Wounds
Venous, Arterial, Neuropathic, Pressure

433,000 patients in Australia at any one time increasing with age and diabetes

- Financial Impact:
  - up to $10,000 per patient/per annum
  - equates to 2% of the national health care budget
  - or $3 billion per annum

- Pressure injury:

Prevalence - 4.5 - 48.4% in acute and sub-acute facilities

In Qld-160,060 bed days lost

= $12,968,668

McCosker, L, Tulleners, R, Cheng, Q, et al. Chronic wounds in Australia: A systematic review of key epidemiological and clinical parameters. *Int Wound J*. 2019; 16: 84– 95. https://doi.org/10.1111/iwj.12996

The Impact of Venous Leg Ulcers

- At any one time 42,600 Australians aged over 60 years suffer VLUs
- Rates of recurrence are high - increasing the health burden
- Majority of these miss out on recommended standard of care due to lack of subsidised compression bandages and stockings that can halve healing times
- The impacts include serious discomfort, reduced mobility, social isolation and mental health concerns
- GPs involved in diagnosis and management of over 90% of diagnosed VLUs

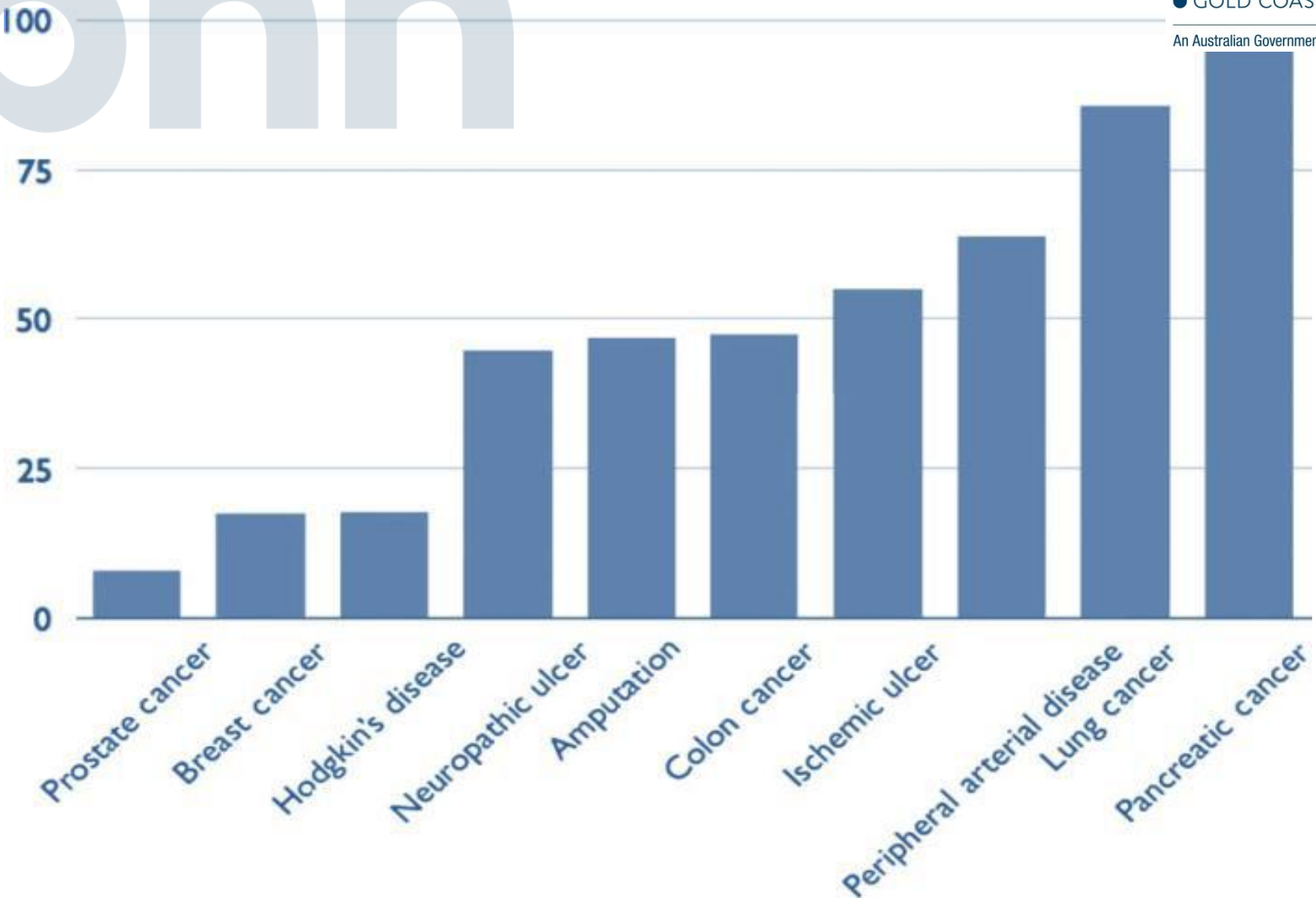
Australian/Queensland Update
Massive Diabetic Foot Disease Costs

2021 Australian evidence-based guidelines for diabetes-related foot disease

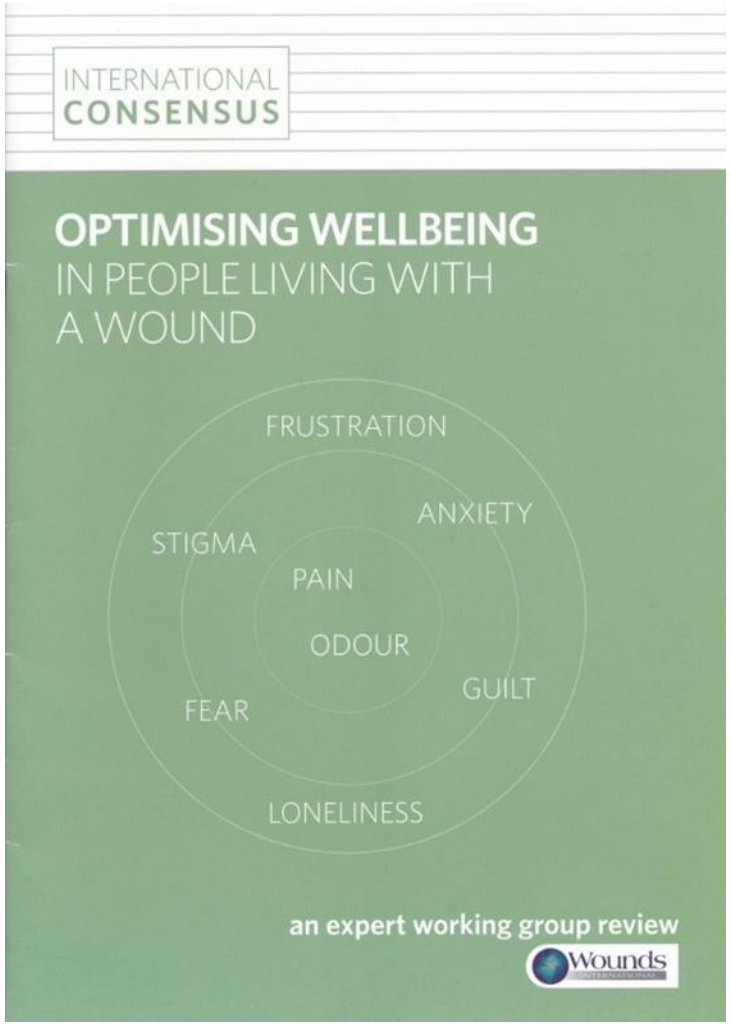
- 50,000 Australians are affected each year by DFD
- A Further 300,000 have risk factors for developing DFD
- Equates to 28,000 hospitalisations annually and direct cost of $350 million
- 4,500 amputations annually
- 1,700 deaths annually
- $ 1.6 billion annually in health care costs
- Very few admitted patients had received recommended multi-disciplinary foot care

"When people with diabetic foot disease receive multi-disciplinary foot care, we can prevent half of the hospitalisations, amputations and costs"

Peter Lazzarini | Senior Research Fellow QUT and Qld Health



Optimising Wellbeing in people living with a wound



Domains of wellbeing :

- Physical – ability to function independently
- Psychological – chronic wounds often associated with increased anxiety, depression and poor quality of life
- Social – patients often embarrassed by dressings, odours, disabled by pain and poor mobility and thus become socially isolated, unable to work
- Spiritual / Cultural-respecting beliefs, religious sensitivities and cultural backgrounds and involving patients in decision making

Bill 72yr

- T2DM
- Ongoing from 1983- 2017
- Open # tibia + ulcers + cellulitis
- Repetitive skin breakdown
- Meds
- Aspirin, statin, metformin, glibenclamide, perindopril

OM L) shin following MVA 80s

- Venous skin changes
- Pedal Pulses
- ABPI ; Incompressible
- Refer Pvt Vasc ; Duplex
- Xray chronic OM ; refer Ortho CT / MRI
- Hyperglycaemia; refer endo, dietician, podiatry, OT, ID


LITE COMPRESSION
CoFlex·TLC CALAMINE LITE
2 LAYER COMPRESSION KIT
2
ANDOVER
Includes Nylon Stockinette
PATENTED TECHNOLOGY - MADE IN THE USA


LAYER 1
Calamine medicated foam comfort roll
LAYER 2
A short stretch layer that provides adaptive compression levels.

Specimen : Swab Left,Foot

Gram Stain : Leucocytes 1+
Epithelials 3+

Gram pos. cocci 1+

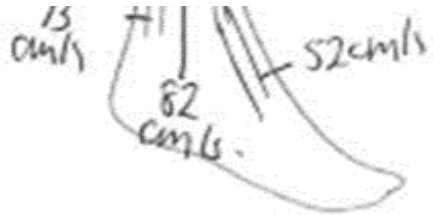
Culture : Normal skin flora 2+

	PEN	FLU	CFZ	DA
Staphylococcus aureus 2+	R	S	S	S

	SXT
Staphylococcus aureus 2+	S

Antibiotic Abbreviations Guide:

PEN	Penicillin G	FLU	Di(Flu)cloxacillin
SXT	Co-trimoxazole	CFZ	Cefazolin
		DA	Clindamycin



October 21

- **Feeling unwell for a week**
- **Intermittent fevers**
- **Foot pain**
- **Re-Assess; Vascular Supply Xray, Bloods**
- **CRP 141, Swab**

TTO, Ankle Block, prep and drape

Incision around wound on plantar surface of foot, small abcess cavity evacuated. No deeper tracking found.

Washout with normal saline. Dressings.

ost Procedure

Post Operative Orders

Wound R/V Monday

Cont Abx

Podiatry review Monday

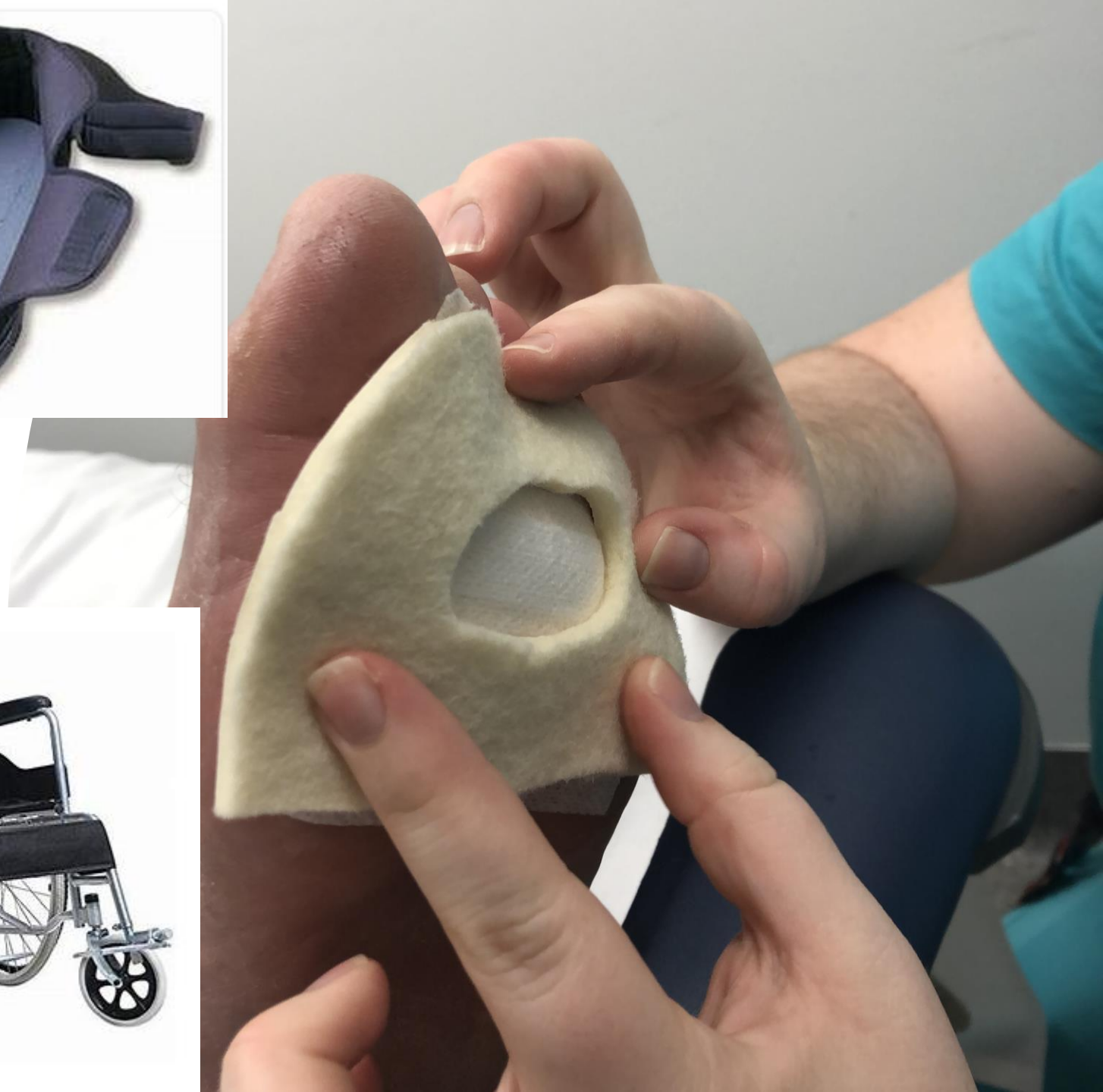
Contact with concerns

16/11/21

23/12/22

31/2/22

Offload



Sanet - Manageress
The happiest person that I have ever met (and she has the job that I would love to have).

r and four cubs – 3 months old

he

urate
me.

Dangerous

- https://th.bing.com/th?id=OVP.Or2F4EP0Y0tFJmj9cW7vSgHgFo&w=216&h=120&c=4&rs=1&o=6&pid=6.1&qlt=80

- https://www.youtube.com/watch?v=yCuTywekVyk
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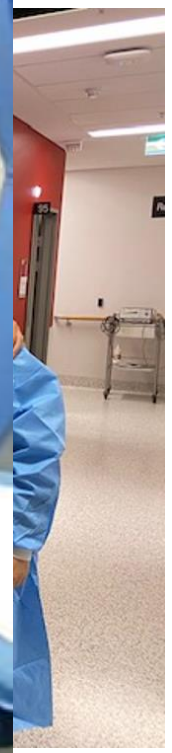
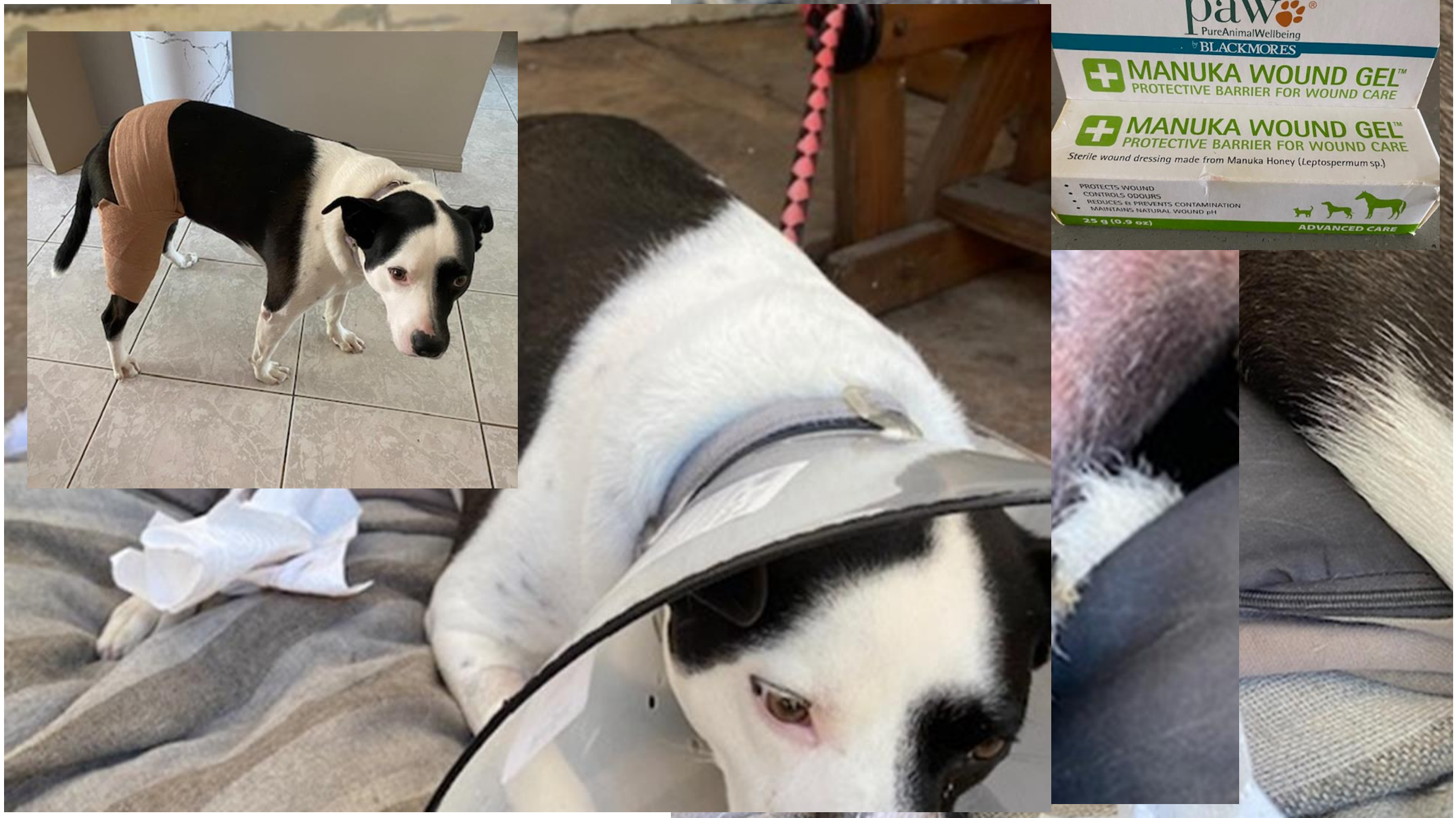


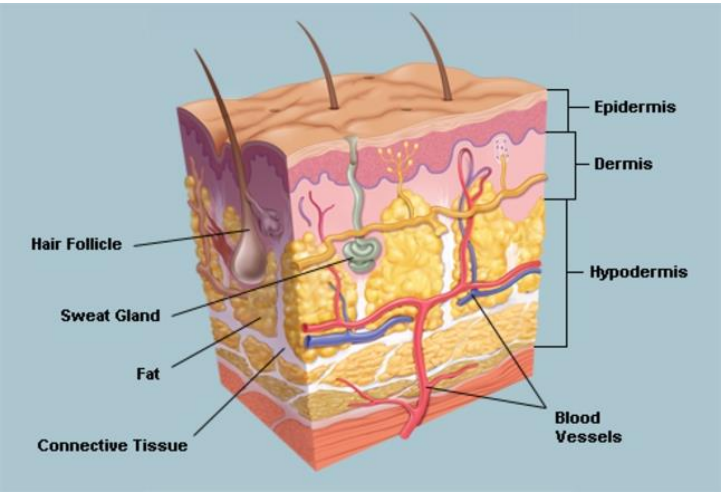


FOR ANIMAL TREATMENT ONLY
paw
PureAnimalWellbeing
by BLACKMORES
MANUKA WOUND GEL™
PROTECTIVE BARRIER FOR WOUND CARE
MANUKA WOUND GEL™
PROTECTIVE BARRIER FOR WOUND CARE
Sterile wound dressing made from Manuka Honey (Leptospermum sp.)
PROTECTS WOUND
CONTROLS ODOURS
REDUCES & PREVENTS CONTAMINATION
MAINTAINS NATURAL WOUND pH
25 g (0.9 oz)
ADVANCED CARE

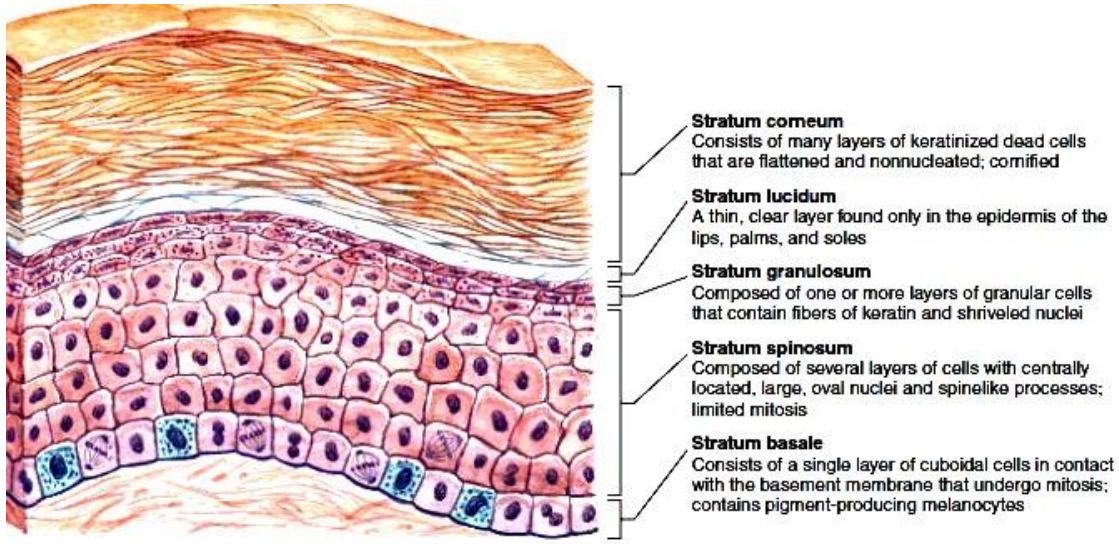
SKIN

Functions

- Waterproofer; wraps our organs
- Defender; bacteria
- Cooler; via sweat
- Sensor; pain, pleasure, temp, pressure



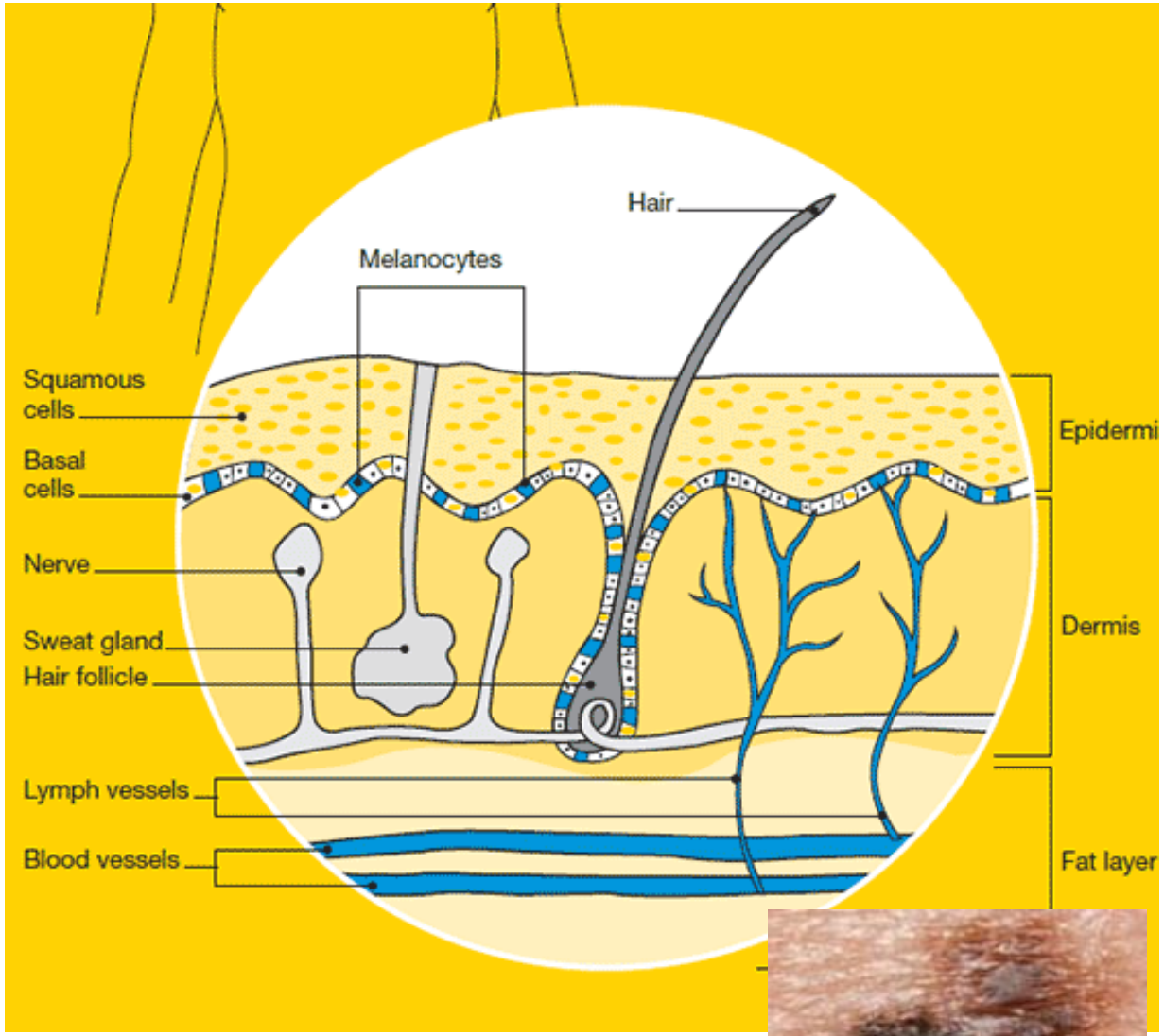
- Epidermis ; sheets of cells (300,000) 1cm Sq



- Dermis ; elastic fibres (elastin) protein fibres ; collagen (strength)
- Sweat (100) , sebaceous (15) hair follicles, blood vessels (0.9m) , nerves (3.7m)

Subcutaneous Layers; fat layer for thermal insulation, protection

https://www.cancervic.org.au/cancer NMSCs non melanoma skin cancers



BCC (70% of non-melanoma cancers ; starts in lower layer)

SCC (30% of non-melanoma cancers; starts in upper layer) 2-5% metastasize

Melanoma (2 %) starts in melanocytes

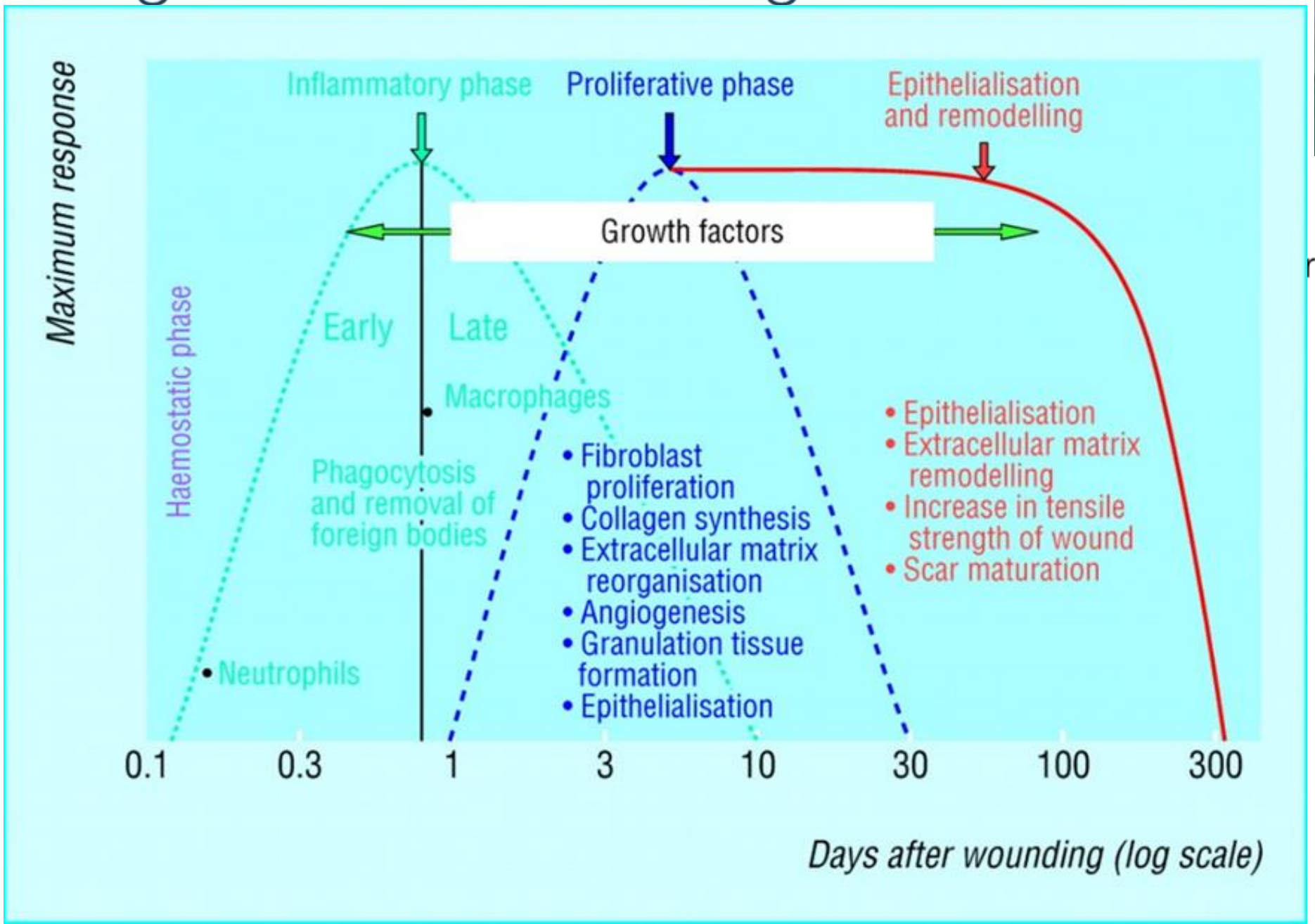
more serious; mets

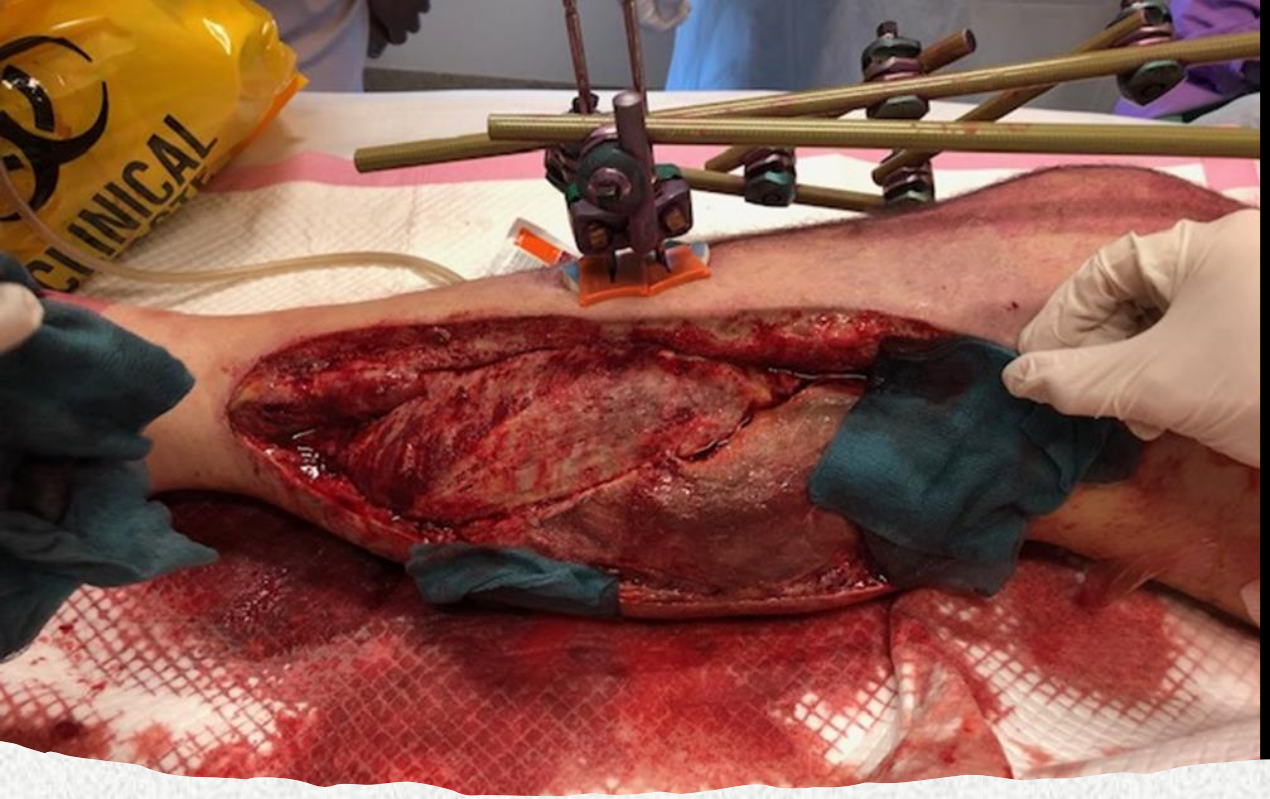
75% skin ca deaths

WHAT ARE THE 4 PHASES OF WOUND HEALING?

- A) Haemostasis, Inflammation, Proliferation, Maturation
- B) Inflammation, Clotting, Proliferation, Modelling
- C) Bacteria, Inflammation, Pus, Scar
- D) Haemostasis, Proliferation, Inflammation, Maturation

Stages of Wound Healing





Infection

- **Inflammation**

WHAT DOES THE ACRONYM “T.I.M.E.R.S” STAND FOR?

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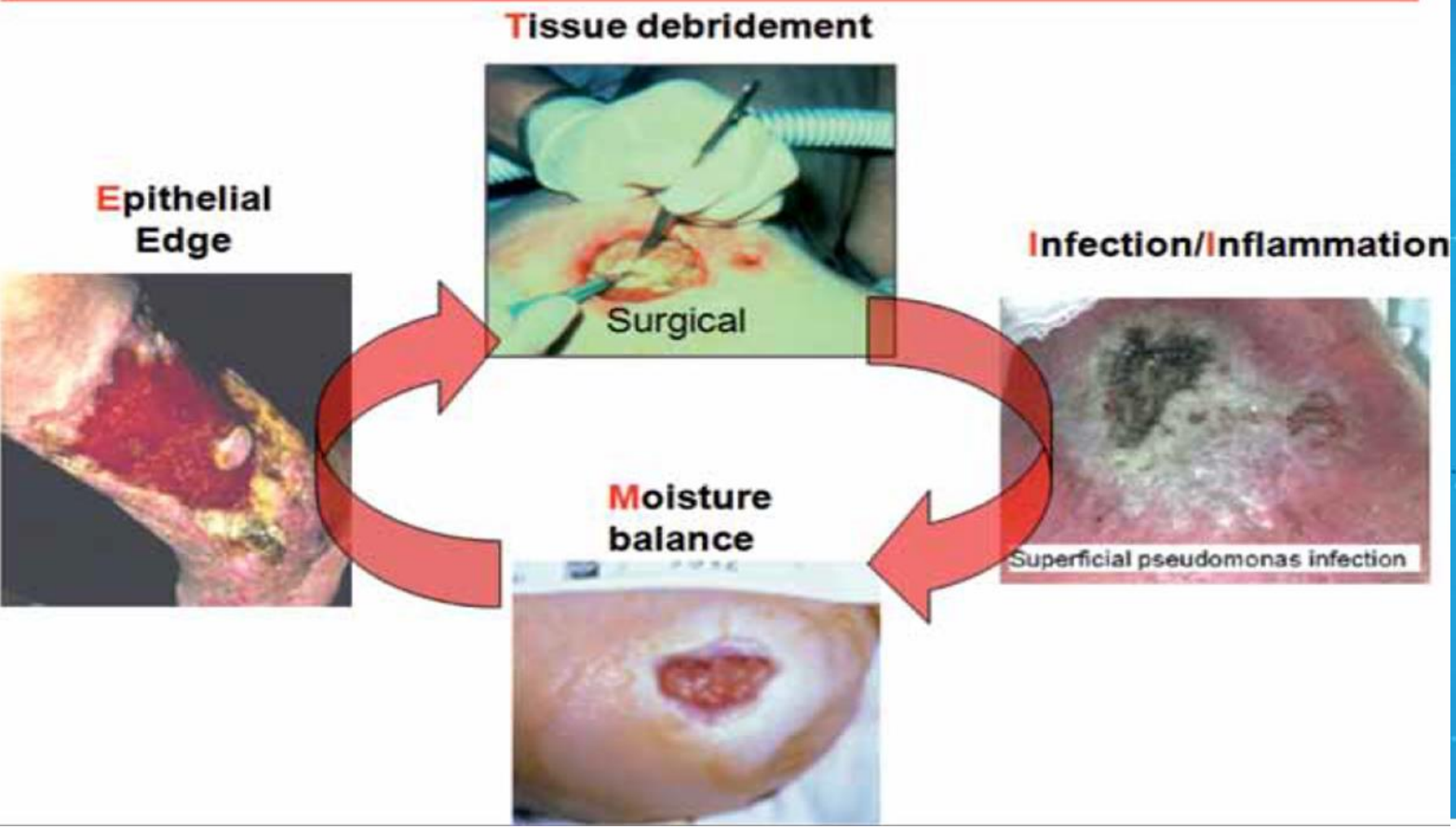
C) THERAPY, INFECTION / INFLAMMATION, MOISTURE CONTROL, EDUCATION, REMODEL, SOCIAL FACTORS

D) THERAPY, IMPROVEMENT, MANAGEMENT, EDGE MIGRATION, RENEWAL, SALVAGE

Permission to use concept for training
Anthony Kerr: anthony.kerr@markallengroup.com

Wound Bed Preparation and 'T I M E'

Tissue, Inflammation/Infection, Moisture, Edge






Tissue

What leads to poor healing

Individual Factors

- Poorly controlled diabetes
- Peripheral neuropathy
- Neuroarthropathy (charcot)
- Radiation therapy or chemotherapy
- Conditions associated with hypoxia and/or
- poor tissue perfusion
- Immune system disorders
- Connective tissue disorders
- Corticosteroid use
- Malnutrition or obesity
- Alcohol, smoking or illicit drug use
- Poor compliance with treatment plan

Wound Factors

Acute wounds

- Contaminated or dirty wounds
- Traumatic injuries
- Operation is classified as contaminated or dirty
- Inappropriate hair removal
- Operative factors (e.g., prolonged surgery, blood transfusion or hypothermia)

Chronic wounds

- Duration of wound
- Large wounds
- Anatomically located near a site of potential contamination (e.g., perineum or sacrum)

Acute and chronic wounds

- Foreign body presence (e.g., drains, sutures or wound dressing fragments)
- Haematoma
- Necrotic or sloughy wound tissue
- Impaired tissue perfusion
- Increased exudate and oedema that is not adequately managed
- Wounds over bony prominences or probing to bone
- Involvement of tissue deeper than skin and subcutaneous tissues (e.g., tendon, muscle, joint or bone)

Environment

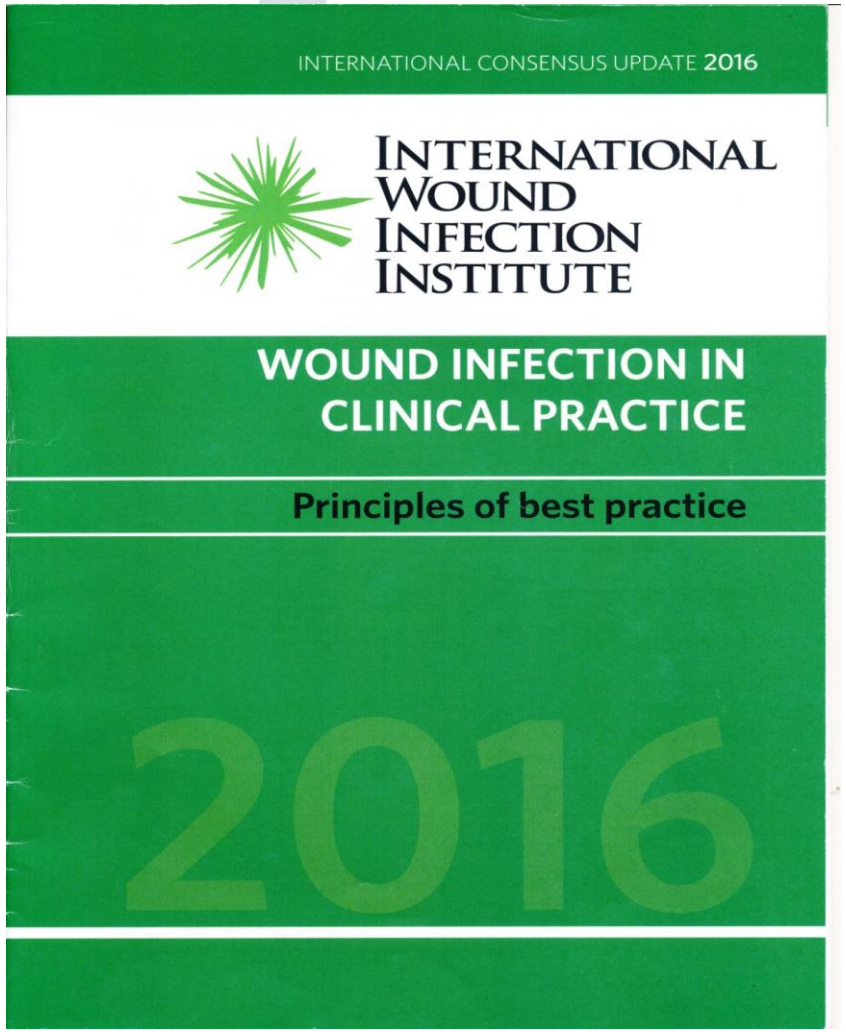
- Unhygienic environment
- Hospitalisation
- Inadequate hand hygiene and aseptic technique
- Inadequate management of moisture
- Interface pressure that is inadequately off-loaded

The International Wound **Infection** Institute (2022) define wound infection

- Quantity of microorganisms in a wound become imbalanced such that the host response is overwhelmed, and wound healing becomes impaired.

- Transition from non-infected to infected is a gradual process determined by the quantity and virulence of microbial burden and the individual's immune response (IWII), 2022)

International Wound Infection Institute. Wound infection in clinical practice 2016



INFECTION CONTINUUM

INFECTION INSTITUTE

Increasing microbial burden in the wound

As the continuum green shading darkens, microbial burden increases

CONTAMINATION	COLONISATION	LOCAL WOUND INFECTION COVERT (subtle)	LOCAL WOUND INFECTION OVERT (classic)	SPREADING INFECTION	SYSTEMIC INFECTION
• Microorganisms are present within the wound but are not proliferating • No significant host reaction is evoked • No delay in healing is	• Microorganisms are present and undergoing limited proliferiation • No significant host reaction is evoked • No delay in wound	• Hypergranulation • Bleeding, friable granulation • Epithelial bridging and pocketing in granulation tissue • Increasing exudate • Delayed wound healing beyond expectations	• Erythema • Local warmth • Swelling • Purulent discharge • Wound breakdown and enlargement • New or increasing pain • Increasing	• Extending induration • Spreading erythema • Lymphangitis • Crepitus • Wound breakdown/ dehiscence with or without satellite lesions	• Malaise • Lethargy or nonspecific general deterioration • Loss of appetite • Fever/pyrexia • Severe sepsis • Septic shock • Organ failure • Death

Stages in the Wound Infection Continuum

Virtually from the time of wounding, all open wounds are contaminated with microbes.

Contamination

- non-proliferating bacteria
- no host reaction
- host defences respond swiftly to destroy bacteria by phagocytosis

Colonisation

- replicating bacteria
- no host reaction
- wound healing is not impeded or delayed

Local Infection

Covert (subtle) signs of local infection:

- Hypergranulation - (excessive ‘vascular’ tissue)
- Bleeding, friable granulation
- Epithelial bridging and pocketing in granulation tissue
- Wound breakdown and enlargement
- Delayed wound healing beyond expectations
- New or increasing pain
- Increasing malodour

Overt (classic) signs of local infection:

- Erythema
- Local warmth
- Swelling
- Purulent discharge
- Delayed wound healing beyond expectations
- New or increasing pain
- Increasing malodour

Wound Bed Preparation - TIME

Stages in the Wound Infection Continuum

Local Infection

- increased microbial burden invoking a host response
- infection is contained in one location, system or structure
- subtle or covert signs initially that may develop into more classic signs

Spreading Infection

- the invasion of the surrounding tissue by infective organisms that have spread from a wound
- microorganisms proliferate and spread, to a degree that signs and symptoms extend beyond the wound border
- may involve deep tissue, muscle, fascia, organs or body cavities.

Spreading Infection

- Extending in duration +/- erythema
- Lymphangitis
- Crepitus
- Wound breakdown/dehiscence with or without satellite lesions
- Malaise/lethargy or non specific general deterioration
- Loss of appetite
- Inflammation, swelling of lymph glands

Systemic Infection

Sepsis – documented infection with pyrexia or hypothermia, tachycardia, tachypnoea, raised or depressed WCC

Severe sepsis – and multi-organ failure

Septic shock – sepsis and hypotension

Death

Investigations - Microbiology

- Microbiological tests should not be performed routinely
- Tests are only to support and guide management
- Sampling techniques:
  - wound swabbing-Levine, Z-Zag methods
  - needle aspiration
  - wound biopsy
- Beware of interpreting a microbiology report in isolation, consider report in context of patient and the wound.

Principles for Wound Swabbing

- Culture clean tissue-remove loose debris by irrigating with sterile saline
- Do not culture slough or necrotic tissue
- Do not use antiseptics prior to culture
- Levine method preferred-obtaining fluid and microbes at or below wound bed
- Obtain specimen from cleanest area in the wound
- Consider biopsy

(Morison et al., 2005; Bryant & Nix, 2007)

Biopsy – Quantitative Bacteriology

Pros …

- Accurately identifies the type and number of organisms in tissue

Practice Point

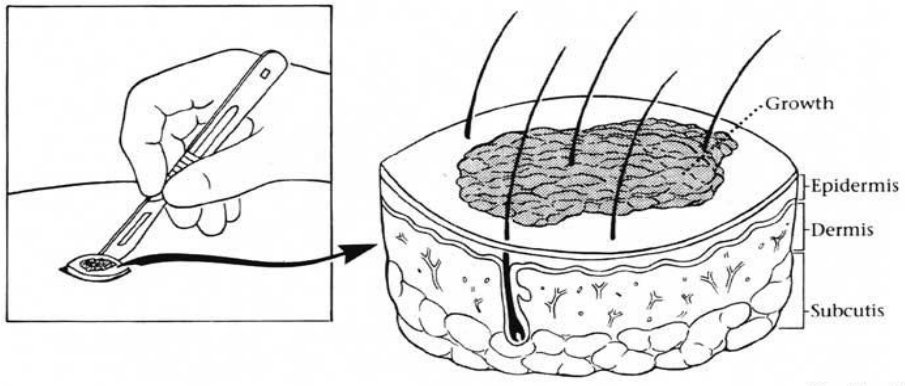
Ask for histology as well

[put in saline, not formalin]

Reserve for wounds with delayed healing

Cons …

- Requires technical expertise
- More time consuming
- Restricted to hospitals or doctors rooms
- Increased cost
- Causes pain
- May delay healing but generally regenerates well



Wound Infection

- Antibiotic resistance has risen from excessive use of antibiotics in community and hospitals.
- Now have – multi-resistant or community acquired MRSA and Pseudomonas developing resistance to Ciprofloxacin.
- No new antibiotics are under development.

Practical points

- *Infection is defined clinically, by the symptoms and signs of inflammation, regardless of the results of any wound culture.*
- *Identify different stages of infection to assist choice of management and wound product.*
- *Effective use of wound products can reduce use of oral antibiotics – essential for these times of increasing rise of resistance in bacteria.*

Case 1

- 72 Yr F 2/7 leg pain, tracking redness and swelling, fevers and rigors
- Similar Hx 2023, 2022 but Abs didn’t work and treated as a vasculitis.
- Not worn compression, extensive oedema, has good pedal pulses

Do you suspect that this wound evolution is due to infection?

- Yes
- No

3-Apr-2024
22:03 AEST

REPORT

HISTORY:
Recurrent episodes of Left lower leg cellulitis?

TECHNIQUE:
US left lower leg.

FINDINGS:
Subcutaneous oedema and hyperaemia throughout the imaged left lower limb. Imaged left popliteal, gastrocnaemius, soleal, large saphenous, posterior tibial and peroneal veins demonstrate normal compressibility and flow on Doppler. Unremarkable appearance of the medial popliteal fossa.

CONCLUSION:
Negative study for DVT.
Imaged findings may represent cellulitis or lymphedema. Correlation with inflammatory markers is recommended.

Dr. Igor Fomin - Registrar.

Which treatment strategy would be the most appropriate?

a) Topical antibiotic

b) Topical antibiotic and systemic antibiotic

c) Topical antiseptic

d) Systemic antibiotic and adapted compression bandage (e.g. Viscopaste, tubigrip 3 graduated layers) from 24 hours after antibiotic initiation, leg elevation and rest

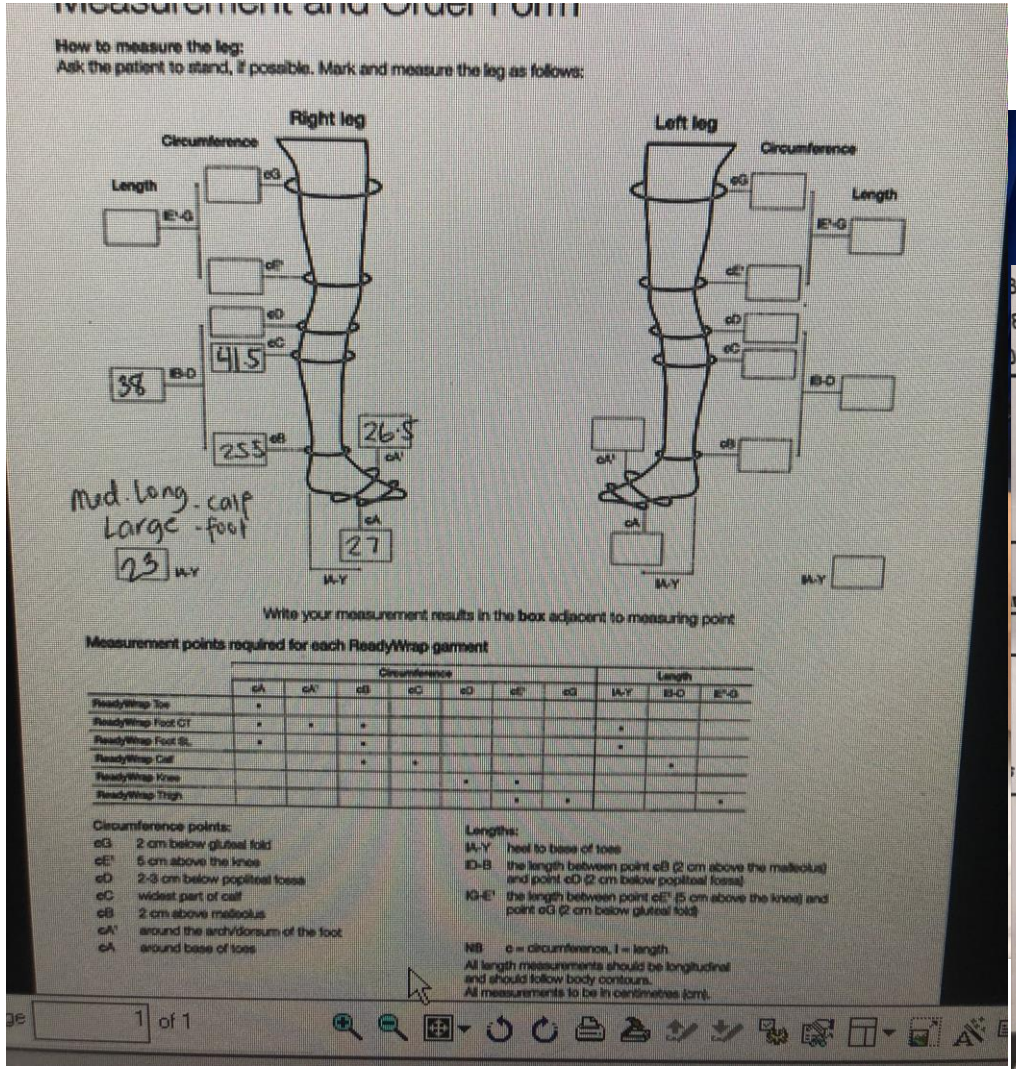
Clinical Practice Points

- Cellulitis requires systemic antibiotic treatment.
- Adjuvant therapy with compression therapy helps to reduce associated inflammation and oedema.
- Compression therapy may decrease the number of cellulitis flares in people with thrombophlebitis, LDS, and recurrent cellulitis.

- Dietician
- Ozempic
- Exercise
- Swimming (once healed)

- Pneumatic compression pumps
- Velcroe wraps

72 Yr M



Measurement and Order Form

How to measure the leg:
Ask the patient to stand, if possible. Mark and measure the leg as follows:

Mod. long. calf
Large - foot
23 lA-Y

Write your measurement results in the box adjacent to measuring point

Measurement points required for each ReadyWrap garment

	Circumference							Length		
	cA	cA¹	cB	cC	cD	cE¹	cG	lA-Y	lB-D	lE¹-G
ReadyWrap Toe	•									
ReadyWrap Foot CT	•	•	•					•		
ReadyWrap Foot SL	•		•					•		
ReadyWrap Calf			•	•					•	
ReadyWrap Knee					•	•				
ReadyWrap Thigh						•	•			•

Circumference points:
- cG 2 cm below gluteal fold
- cE¹ 5 cm above the knee
- cD 2-3 cm below popliteal fossa
- cC widest part of calf
- cB 2 cm above malleolus
- cA¹ around the arch/dorsum of the foot
- cA around base of toes

Lengths:
- lA-Y heel to base of toes
- lB-B the length between point cB (2 cm above the malleolus) and point cD (2 cm below popliteal fossa)
- lG-E¹ the length between point cE¹ (5 cm above the knee) and point cG (2 cm below gluteal fold)

NB c = circumference, l = length
All length measurements should be longitudinal and should follow body contours.
All measurements to be in centimetres (cm).

1 of 1

8:51	55238	Duplex scanning of lower limb arteries (NDS)	06/03/2023	461846CT $149.90
8:51	55238	Duplex scanning of lower limb arteries (NDS)	06/03/2023	461846CT $90.00
08:51	55276	Duplex scanning of abdominal arteries (NDS)	06/03/2023	461846CT $265.00

Excl. GST	$504.90
GST	$0.00
TOTAL	$504.90

mary:

Type	Paid By	Amount	Amount This Invoice	Our Ref.
EFT		$504.90	$504.90	1330190

received for this invoice: $504.90

REMITTANCE ADVICE

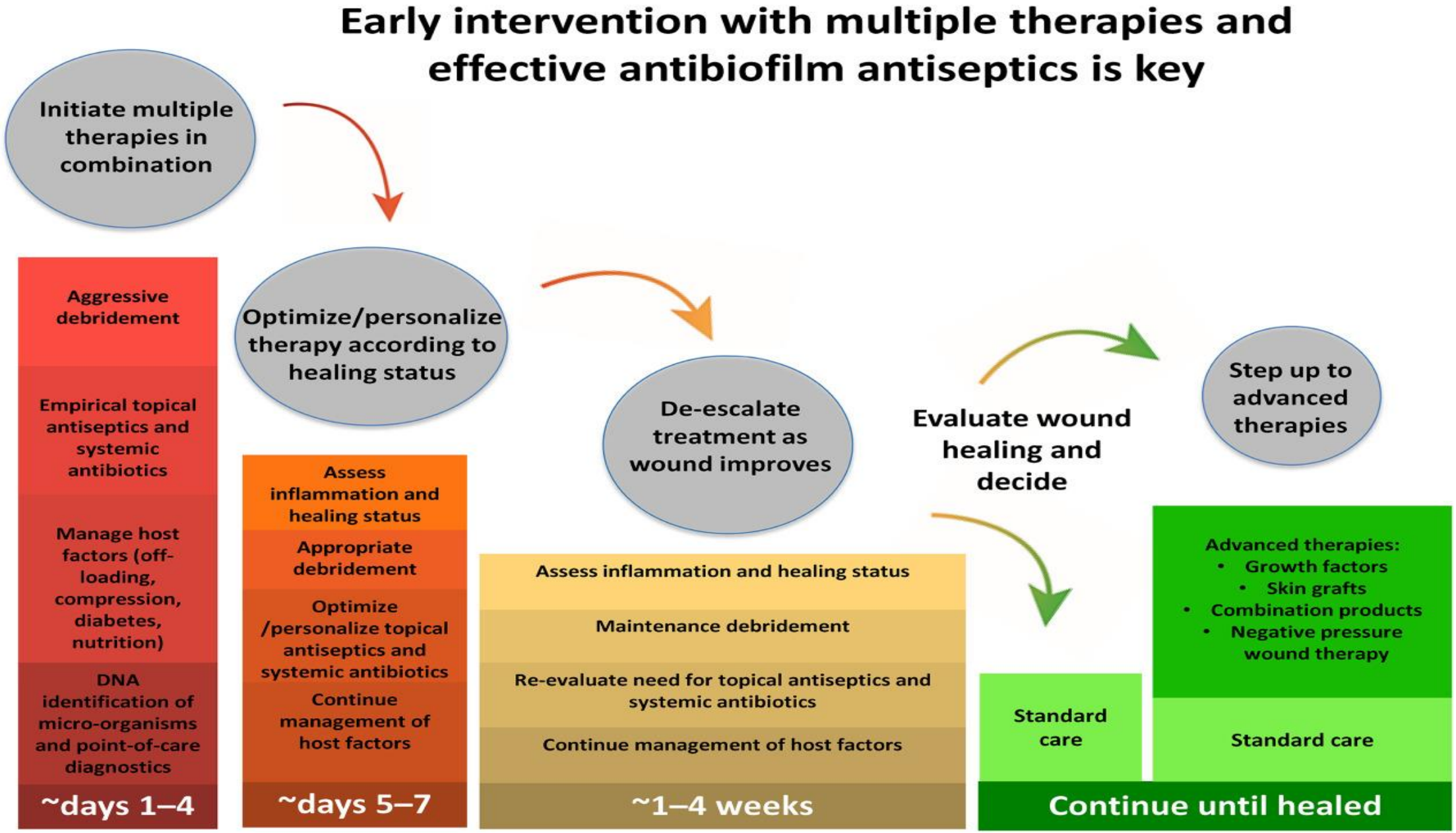
Please detach and include with your postal payment

Biller Code: 134155
Ref: 4590962 9

CREDIT CARD PAYMENT

If paying by post, please complete the following details and include this Remittance Advice with your payment

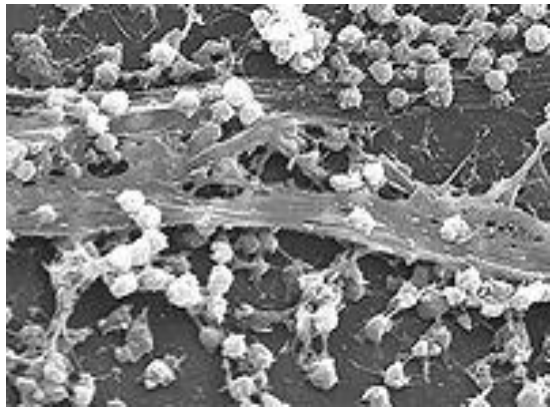
Contamination / biofilm



Wound Repair and Regeneration, Volume: 25, Issue: 5, Pages: 744-757, First published: 29 September 2017, DOI: (10.1111/wrr.12590)

Biofilms

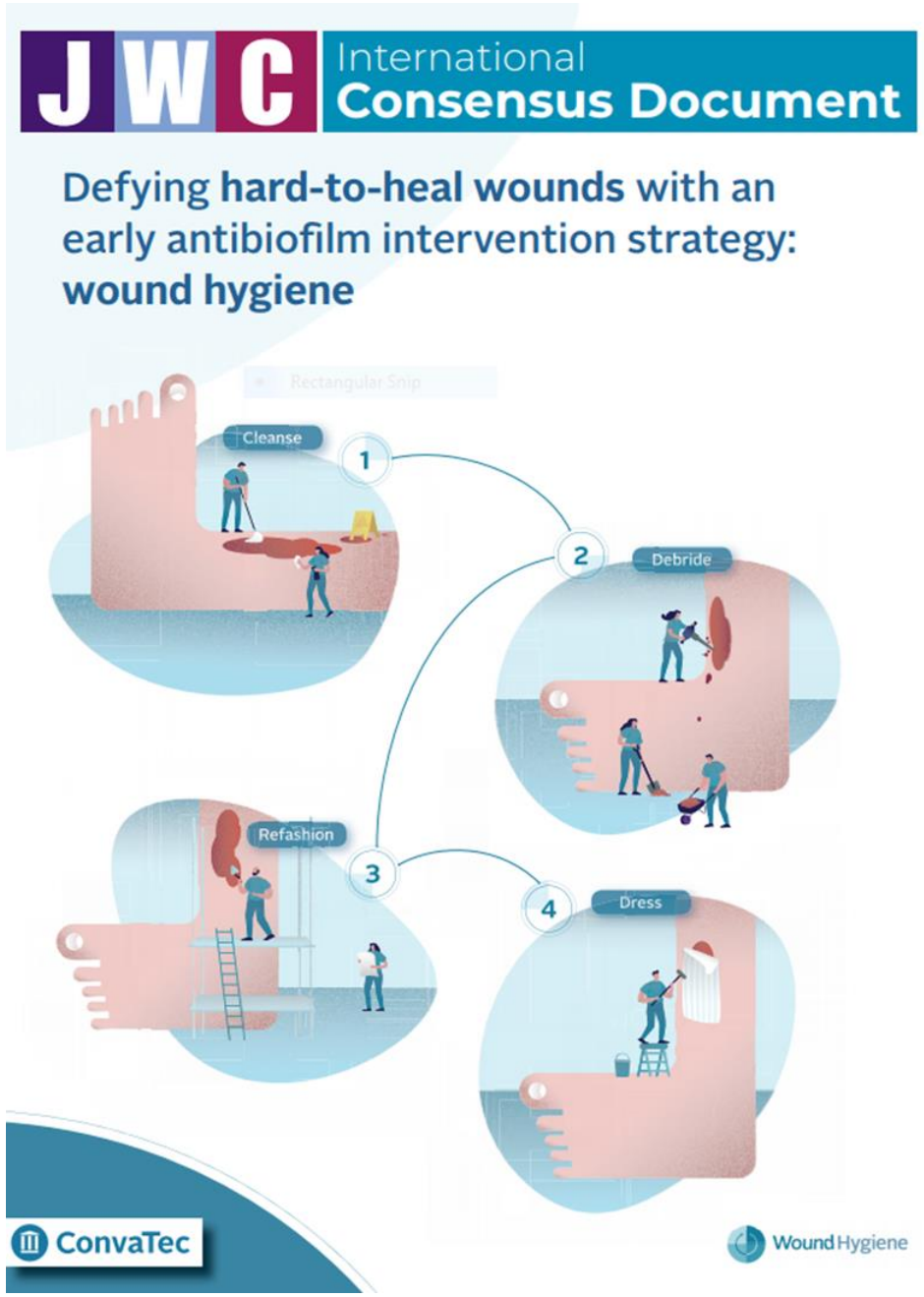
- Occur in 78% of chronic wounds and 6% acute wounds (Murphy et al 2020)
- Structured community of bacterial cells enclosed in a self produced matrix
- May contain multiple species of bacteria
- Difficult to detect-cultures of no value
- Difficult to eradicate
- Can form within 30 minutes
- May develop down to 5mm below wound bed
- Aggressive debridement can reduce the bioburden which can improve healing. Most benefit in first 30 to 60 days
- Bioburden can reform in 8-12 hours thus frequent debriding necessary. In this period bioburden more sensitive to antimicrobials.



Criteria indicative of potential biofilm

Biofilm cannot be directly visualised in a wound. The experienced clinician may suspect biofilm is present through observation of indicative wound characteristics.

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



- Clean
- Debride
- Refashion
- Dress

Debrisoft®
Debridement

- Angled fiber tips for highly efficient results
- 18 million fibers for gentle application
- Sewen edge and reinforced reverse side

- Angled fiber tips loosen debris and exudate from the wound as well as skin flakes and keratosis from the skin surrounding the wound

Indications:

- Debridement of superficial wounds and surrounding skin in cases of:
  - Diabetic ulcers
  - Arterial and venous ulcers
  - Pressure ulcers
  - Postoperative wounds healing by second intention

Debrisoft®
Debridement

BEFORE
Thick Yellow Slough in Wound Bed

AFTER
2-4 Minutes of Debrisofting

*

QUICK EASY REMOVAL PAINLESS REMOVAL OF SLOUGH

* Barbara Pritchard, Wrexham Maelor Hospital, Wales, UK

Wounds are like hands they need to be washed

Surgical Debridement

Curette $11.90

Multigate scissors

Iris Scissors –

Sharp/Sharp Curved with 58mm Blade & White Plastic Handle 50 or more $2.84 each
Re-order code: 36-003

Adson forcep $4.70

Debriflo

Leader In Debridement Innovations

DEBRIFLO DEBRIDEMENT DEBRIFLO UPDATES DEBRIFLO SUPPORT

Ultrasonic Wound Therapy

The Debriflo ~ UWI Ultrasonic Wound Therapy System mixes ultrasonic energy for selective dissection and fragmentation of tissue, wound debridement (acute and chronic wounds, burns, diseased and necrotic tissue) and utilising cleansing saline irrigation at the site for the removal of debris, exudate, fragments and other matter. Not only does the Ultrasound Wound Therapy System provide a superior debriding process, but it also helps stimulate circulation and create cavitation that destroys bacteria and biofilm.

Education & Training

Debriflo is committed to providing customers with high quality education and workshops. We will provide online networking opportunities as well as benchmarking outcomes with other clinicians utilising low frequency ultrasonic wound irrigation.

How D

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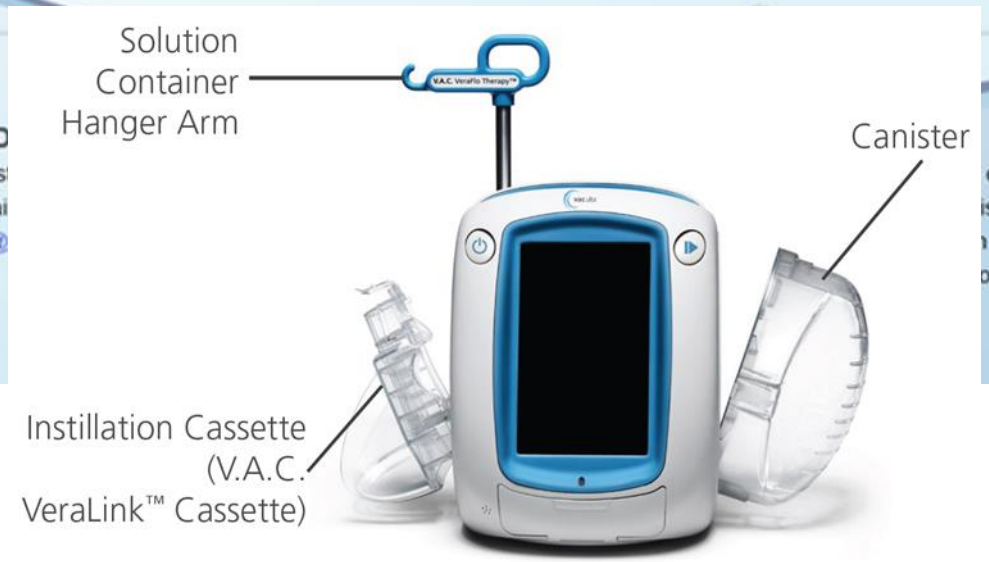
admin@



V.A.C. VeraFlo™ Therapy Provides Automated, Volumetric Fluid Delivery

Mechanical Debridement with low frequency Ultrasound

- Oscillation of microscopic bubbles that concentrates acoustic energy into a shearing field
- Less traumatic, less painful and has selective tissue debridement
- Achieves faster healing rates by reducing the bioburden from debris and biofilms in the wound
- Can be performed in a small clinical setting
- Can reduce need for more aggressive surgical debridement

Antibiotics the only drugs that becomes less effective with use.

- Global studies; 80% of antibiotic courses, and 20% of all antibiotics administered, are prescribed in the community or ambulatory setting.
- In both the outpatient and inpatient settings, up to 50% of these treatment courses are unnecessary or inappropriate.

Antimicrobial stewardship in wound care: a Position Paper from the British Society for Antimicrobial Chemotherapy and European Wound Management Association

BA Lipsky,[1,2] M Dryden,[3] F Gottrup,[4] D Nathwani,[5] RA Seaton,[6] J Stryja[7]
[1]Division of Medical Sciences, Green Templeton College, University of Oxford, United Kingdom
[2]University of Washington, United States of America
[3]Department of Microbiology and Infection, Hampshire Hospitals Foundation NHS Trust, United Kingdom
[4]Copenhagen Wound Healing Center, Bispebjerg University Hospital, Denmark
[5]Ninewells Hospital and Medical School, University of Dundee, United Kingdom
[6]Queen Elizabeth University Hospital, United Kingdom
[7]Department of Science and Research, Educational and Research Institute AGEL, Czech Republic
Corresponding author, email: dblipsky@hotmail.com

antibiotics

MDPI

Review

Antiseptic Agents for Chronic Wounds: A Systematic Review

Koko Barrigah-Benissan [1,†], Jérôme Ory [1,†], Albert Sotto [2], Florian Salipante [3], Jean-Philippe Lavigne [1,*] and Paul Loubet [2]

- Interventions considered were those using antiseptics for cleansing or within a dressing.
- Of 838 studies, 6 were finally included, with a total of 725 patients. The included studies assessed iodine (cadexomer or povidone iodine) (n = 3), polyhexanide (n = 2), and octenidine (n = 1).
- Limited evidence suggested a better wound healing completion with iodine compared to saline (two randomised controlled trials (RCT), 195 patients, pooled RR 1.85 (95%CI (1.27 to 2.69), moderate-quality evidence). There was not enough evidence to suggest a difference in wound healing using octenidine or polyhexamide.

- Barrigah-Benissan, K., Ory, J., Sotto, A., Salipante, F., Lavigne, J.-P., Loubet, P., & Felgueiras, H. P. (2022). Antiseptic agents for chronic wounds: a systematic review. *Antibiotics*, *11*(3). https://doi.org/10.3390/antibiotics11030350

- None of the antiseptic agents influenced adverse event occurrence compared to saline.

Case 2; 62 yr M
Spontaneous lesion R) gaiter area 5cm x 5 cm

- Started 4 weeks prior; nil trauma
- B/G
- Smoker 20 /day
- ETOH 1 bottle wine a day
- HTN / CKD
- Palpable pulses
- No Varicose veins
- Shave Biopsy ; nil malignancy
- No fever, blood test; nil major abnormalities
- Very painful

Do you Suspect the underlying problem is infection here ?

A) Yes
B) No

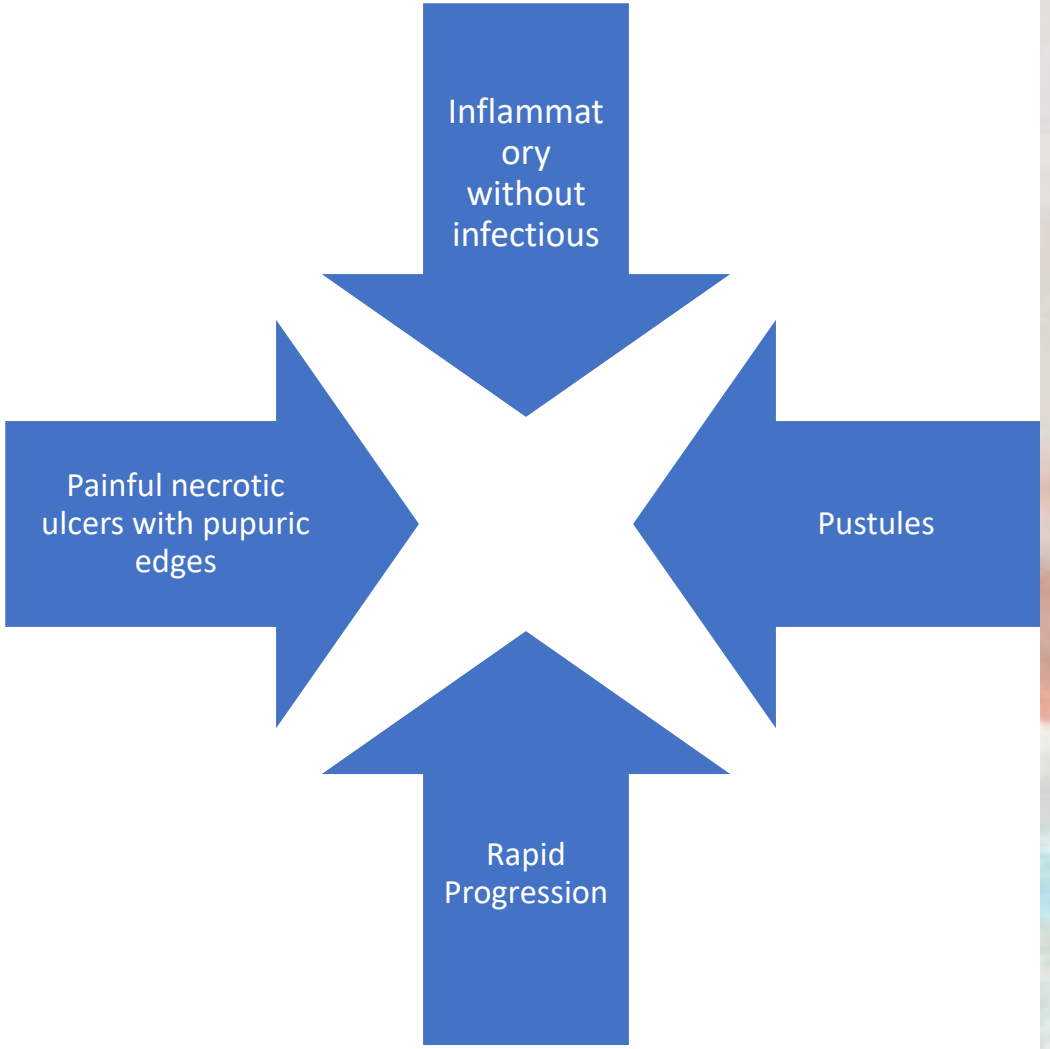
Would you swab this wound for bacterial culture to discard infective process?

A) Yes
B) No

Which further investigation would help diagnostics

A) Arterial Duplex USS
B) Biopsy of the wound edge for histological examination
C) Blood Test
D) Imaging test

Diagnostic criteria



Diagnosis of exclusion

- Association with IBD, haematological malignancies, RA
- Biopsy ; neutrophilic inflammation
- Systemic treatment
- Immunosupression
- Oral corticosteroids, cyclosporin
- Tx IL Steriods / soothing dressings
- Do NOT sharp debride / USWD

Pyoderma gangrenosum

Various diagnostic criteria have been proposed

MAJOR CRITERION

Biopsy of ulcer edge with neutrophilic infiltrate

\+ ≥ 4

MINOR CRITERIA

- Exclusion of infection
- Pathergy phenomenon
- History of inflammatory bowel disease (IBD) or inflammatory arthritis
- History of papules, pustules or rapidly ulcerating vesicles
- Peripheral erythema, undermining border, and tenderness
- Multiple ulcerations, at least one on an anterior lower leg
- Cribriform scars at healed ulcer sites
- Decreased ulcer size within one month of initiating immunosupression

Maverakis et al., 2018

Treatment

- Systemic & topical steroid ointment
- PPI (proton pump Inhib) **Pantoprazole**
- PJP (pneumocystic jiroveci pneumonia) **Bactrim**
- Referrals; Ophthalmology

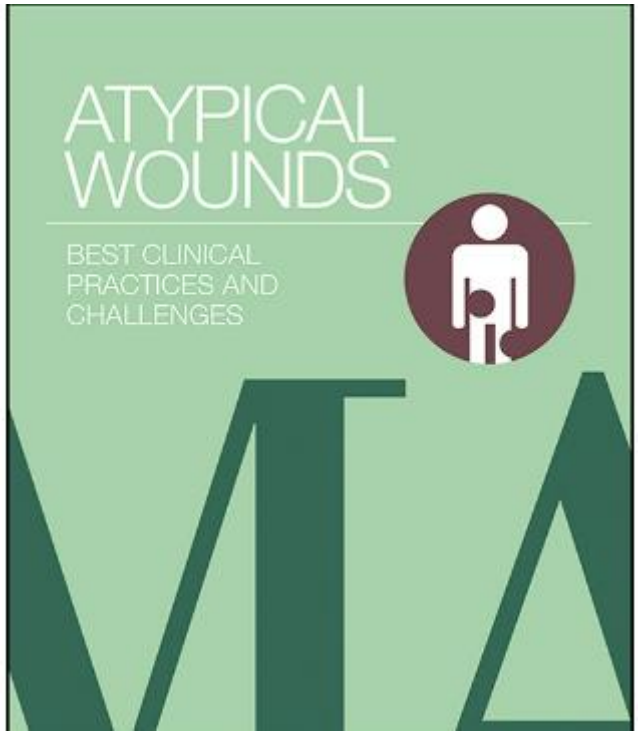
(potential cataracts for long term pre use) Endocrine; Renal

- IL cortico-steroid
- IVIG
- Nervoderm patch

Therapeutic alternatives for systemic treatment in patient with pyoderma gangrenosum

TRADITIONAL SYSTEMIC AGENT	BIOLOGICS
Prednisolone	Infliximab
Cyclosporin	Adalimumab
Azathioprine	Etanercept
Dapsone	Ustekinumab
Mycophenolate Mofetil	Secukinumab
Methotrexate	Anakinra
	Canakinumab

Caused by inflammation / infection / malignancy / chronic illness / genetic disorders



- 20 % of all chronic wounds
- Unable to be categorised in main 5
- Venous, arterial / mixed / diabetic pressure ulcers

Maverakis, E., Le, S. T., Callen, J., Wollina, U., Marzano, A. V., Wallach, D., Schadt, C., Martinez-Alvarado, Y. C., Cheng, M. Y., Ma, C., Merleev, A., Ormerod, A., Craig, F., Jockenhofer, F., Dissemond, J., Salva, K., Williams, H. C., & Fiorentino, D. (2019). New validated diagnostic criteria for pyoderma gangrenosum. *Journal of the American Academy of Dermatology*, *80*(4), e87–e88. https://doi.org/10.1016/j.jaad.2018.08.068

Moisture Balance

- Weepy excoriated
- Protease burn
- Cause?

- Wound plan?

EDGE MIGRATION

72yr M metal vs shin

16/10/20

Regeneration & Social Fa
42yr T2DM Chef 17/9/21 to

Repair & Regeneration

- Failing conservative Tx
- GF, PRP (platelet rich plasma)
- Bioengineered substitutes
- NPWT
- HBO
- Stem cell
- Skin graft

Social Factors

- Social Situation
- Pt Understanding
- Concordance
- Choices
- Psychosocial
- Belief systems

Lunch 1.15pm –1.55pm

Wound Products / Dressings

1.55pm -3.15 pm

Objectives

- Wound products
- Wound Dressing procedures
- Common wounds
- Skin tears
- Blisters
- Pts compromised by Oedema or infection
- EBP of DFI +Pressure relief

Moiste Wound Healing Motto…

If its wet……..DRY it!
If its dry with blood supply…MOISTEN it!
If its dry with NO supply… keep dry!
If its irritated…SOOTHE it!
If its chronic…IRRITATE it!
If its palliative. COMFORT it!
If its oedematous SQUEEZE it!
If its red RELIEVE it!
If its green .. NUKE it!
If its radiated … RUN !
If its come apart bring it together

If its wet dry it:

Sodium Hypochlorite

Bleach soaks is same concentration to bleach baths:

So 1.2mls 4% bleach in 1L of water
Can soak flannel/gauze etc and then leave on legs for 15mins

The Paediatric Society of New Zealand
Te Kāhui Mātai Arotamariki o Aotearoa

NZCYCN
New Zealand Child & Youth Clinical Network

Bleach Baths for Eczema

Why use a bleach bath?
Bleach - sodium hypochlorite baths decrease bacteria (bugs) on the skin. This can help improve active eczema and prevent skin infection.

When should I use it? When the skin is dry, red, and itchy or infected (active eczema).

How often? Twice a week. See your doctor or nurse if skin is irritated by the bath, or if infection occurs.

What sort of bleach should I use? Bleach is sold as household cleaner. Choose one that is plain and has no added fragrance or detergent. They come in different strengths - see below. Bleach gets weaker over time so you may need to replace with a fresh bottle

Value Extra Strength Bleach	CLOR-O-GENE	Necessities Bleach
Buy at: ***New World Pak'n Save Four Square***	Buy at: ***New World Pak'n Save Four Square***	Buy at: ***The Warehouse***
4.2% Bleach	*3.1% bleach*	*2.1% bleach*

Make sure you store bleach where children cannot reach it.

1. *Fill your bath or tub with warm water*
   - ✓ A full-sized bath filled 10cm deep holds about 80 litres of water
   - ✓ A baby's bath holds around 15 litres of water
   - ✓ Work out how much water is in your bath by filling it to a mark using a bucket or large bottle

For more info:

2. *Add bleach and mix well*
   - ✓ For a **4.2%** product, **add 1 ml for every litre of water**
   - ✓ For a **3.1%** product, **add 1.3 mls for every litre of water**
   - ✓ For a **2.1%** product, **add 2 mls for every litre of water**

Work out the amount of bleach to add to the bath here:

_____

3. *Soak in the bath for 10 – 15 minutes then wash with non-soap cream*
   - ✓ Rinse off with tap water
   - ✓ Pat skin dry with a towel. Do not share towels
   - ✓ Apply steroid and moisturiser creams

The NZ Child and Youth Eczema Clinical Network, Te Rōpū Kiripai Hapori. Reviewed Aug 2023. Due Review Aug 2025.

ESSITY sorbact

DACC (or Dialkylcarbamoylchlorid), a fatty acid which coats all *wound dressings.*

Cell surface Hydrophobic

Within 15–30 seconds Adsorbs and inactivates pathogens, e.g. Staphylococcus aureus and Pseudomonas aeruginosa. Bacteria and fungus bind to Sorbact until the dressing is removed from the treated area.

Antimicrobials

Products aiding in controlling growth and multiplication of bacteria

- may have multiple functions
- Iodosorb-also controls and absorbs exudate, debride wound bed
- Medicated honey-also can debride wound bed
  - Manuka, Comvita, Medihoney
- Special Alginates-Flaminyl, also debrides and rehydrates
- Ag products

If its dry with supply…MOISTEN it!
Or debride CSWD

Moisture Donation

Products applied to wound to allow moisture to transfer from the product to the wound to rehydrate dry wounds

- Hydrogels
  - Solugel, Intrasite Gel, Purilon Gel, Duoderm Gel
- Sheet Hydrogels
  - Aquaclear, Nugel
- Isotonic saline
  - Tenderwet

If its dry with no supply keep it dry

If is chronic irritate it

Hydrogels
Hydrocolloids
Alginates
Hydrofibe
Isotonic impregnated pads
Cadexomer iodine based products
Hypertonic saline
Enzynmatic alginates
Medicated honey
Silver based products
Capillary wicking products
Biosurgical larvae products
Teatree oil based products

If its irritated sooth it:

If it’s oedematous SQUEEZE it

- If its palliative comfort it

- If it’s red relieve it

- If its green NUKE IT

Antimicrobials

Products aiding in controlling growth and multiplication of bacteria

- may have multiple functions
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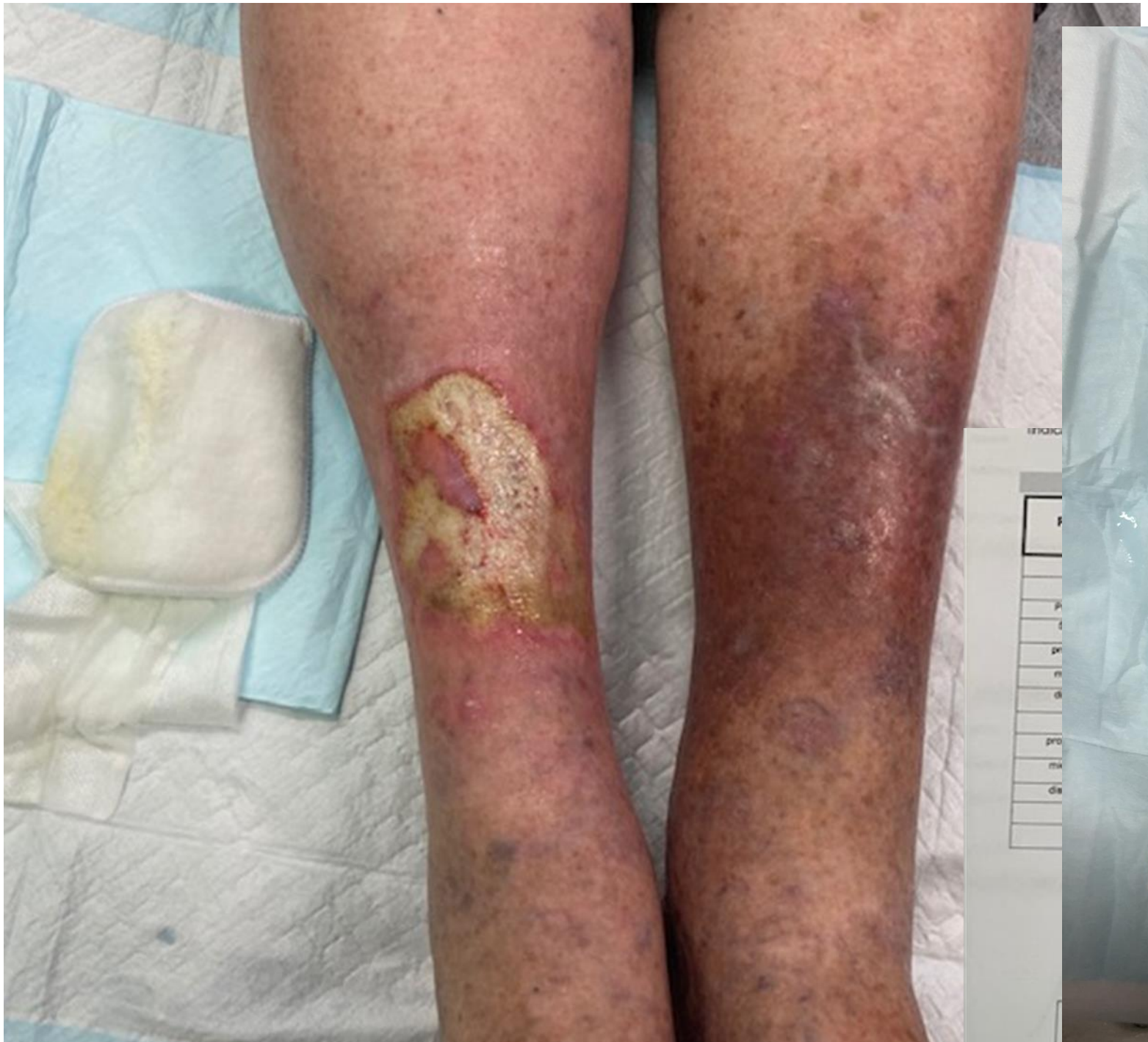


70 yr F July 23, Sept 23, Dec 23

- RT skin necrosis
- BCC E/O

Oxygen compared

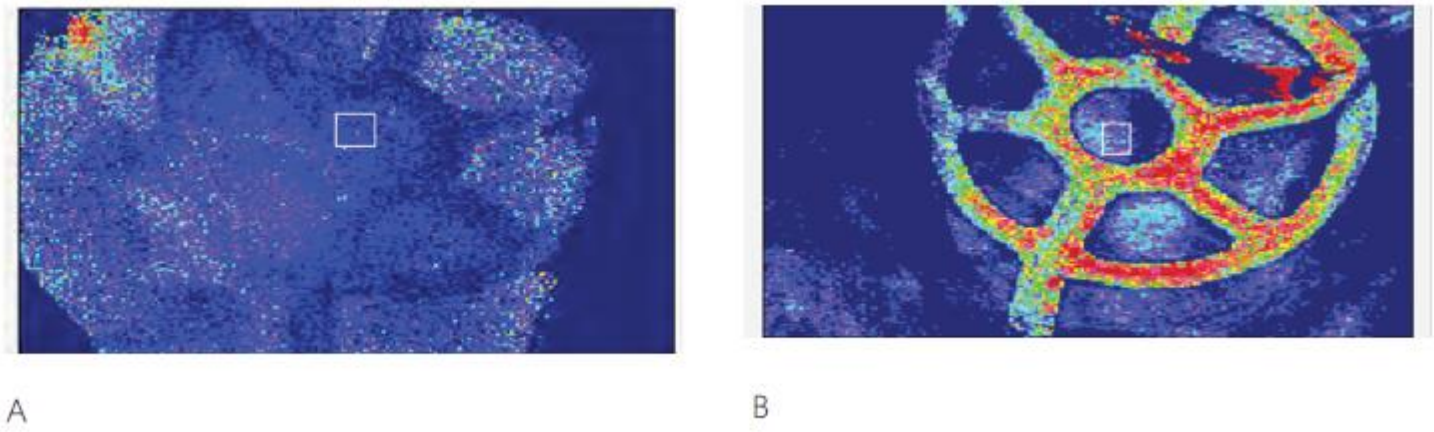
- HBO limited evidence
- Has short bursts only

- Natrox reached capillary bed binds to de-oxygenated haemoglobin

TABLE 2: Wound oxygen therapies compared (Tawfick and Sultan, 2012; Eggleton et al, 2015; Data on file, Inotec AMD Ltd)

	Hyperbaric oxygen therapy	Local perfusion via extremity chambers	Topical oxygen therapy: NATROX
Estimated local oxygen levels at wound during treatment* (mmHg)*	1800	800	650
Daily oxygen exposure (hours)	1.5	5	23
% of the week receiving therapy**	4	21	96

*Calculated on the basis that 100% oxygen at 1 atmosphere = 760mmHg. **Calculated on the basis of treatment occurring for 5 days/week for hyperbaric oxygen therapy and 7 days/week for the other oxygen treatment systems.



A B

Figure 4: Oxygenated haemoglobin levels in healthy skin with NATROX switched off (a) and on (b) - see text for explanation (Data on file, Inotec AMD Ltd)




20/7/21 27/7/21 3/8/21 10/8/21

If its come apart bring it together

Independence Austalia

- Flaminal Hydro

$28.00

- Iodosorb paste

$78.98

- Iodosorb powder

$13.59

- Debrisoft

$21.89

- Aquacel AG

$33.00

Independence Australia

• Coban / lite	$43.95
• Acticoat flex 7 day 5 x 5cm	$ 39.77
• Acticoat flex 3 days 5 x 5cm	$ 24.42
• Allevyn lifeFoam 12.9 x 12.9	$13.90
• Inadine 10 x 10cm	$ 3.91
• Sorbact 7 x 9 in 8 layers	$6.88
• Melolin 10 x 10	$2.75
• Aquacel foam 10 x 10	$7.35
• Mepilex ag 10 x 10	$24.65
• Zetuvit plus 10 x 10	$3.19
• Co-flex calamine	$40.90
• Ready wrap calf medium	$231.30
• Hypafix 10 M	$38.12

Products to Reduce Pain in the Wound or on Dressing Changes

- Biatain IBU - will also manage exudate and maintain moist environment
- Hydrogels on a dry wound
- Tulles - Hydrotul, Urgotul
- Silicone dressings - Mepital

Calciphylaxsis

https://dermnetnz.org/topics/calciphylaxis

- https://www.ausmed.com.au/learn/explainers/skin-tears-and-the-star-classification-system?utm_source=link&utm_medium=resource_share

Warning: Instruct patient to call if burning or discomfort is an issue

phn GOLD COAST
An Australian Government Initiative

Allergy to bandage

Allergy to a dressing

Scar Management Products

To prevent or treat hypertrophic and keloid scars- soften and flatten scar tissue

- Polyacrylate tapes - e.g. Fixomull
- Silicone sheets – e.g. Cicacare
  - can be washed and reused
- Mepiform
- Kelo-cote

Cleansing solutions and gels

- Sterile normal saline -no effect on biofilm , non-antiseptic solution
- Sterile water - no effect on biofilm, non-antiseptic solution
- Potable tap water - not sterile
- PHMB-surfactant qualities, low cytotoxicity, disrupts biofilm attachments, does not promote bacterial resistance
- Octenidine dihydrochloride (OCT) - surfactant, antimicrobial, high cytotoxicity no disruption to healing, prevents formation of new biofilm
- Super-oxidised with hypochlorous acid (HOCL) and sodium hypochlorite – antiseptic, penetrates biofilm rapidly
- Povidone iodine-antiseptic, inhibits development of new biofilm, eradicates young biofilm, significantly reduces mature biofilm, enhances angiogenesis, thereby promoting healing, may inhibit excess protease levels in chronic wound.

The Basic Principles for Management of Chronic Wounds

1. Evaluation of Ulcer Aetiology
2. Treatment of Underlying Cause
3. Management of the Wound
4. Monitoring and maintenance of healing of Wound

Wound Assessment and Diagnosis

HEIDI

- History- patient, medical history, wound, previous wounds ,identify factors affecting healing
- Examination : general and local

  -venous disease, limb ischaemia, lymphoedema, neuropathy

  -different wounds have different characteristics eg position on leg , shape ,exudate ,wound edge etc
- Investigations-blood pathology, ABP Index [most frequently used to assess arterial circulation] , arterial and/or venous duplex scanning, microbiology and histopathology, imaging
- Diagnosis
- Indicators and Intervention-documentation-measurements, photographs, document regularly [weekly] to evaluate healing

Practical Point

If VLU is not healing at optimal rate of 25% improvement in 4 weeks review diagnosis, assessment and management

70% of uncomplicated VLU should be healed in 12 weeks

Diabetes

Each year in Australia

- DFU affects an estimated 50,000 people
- resulting in around 30,000 hospitalisations
- and 5000 amputations

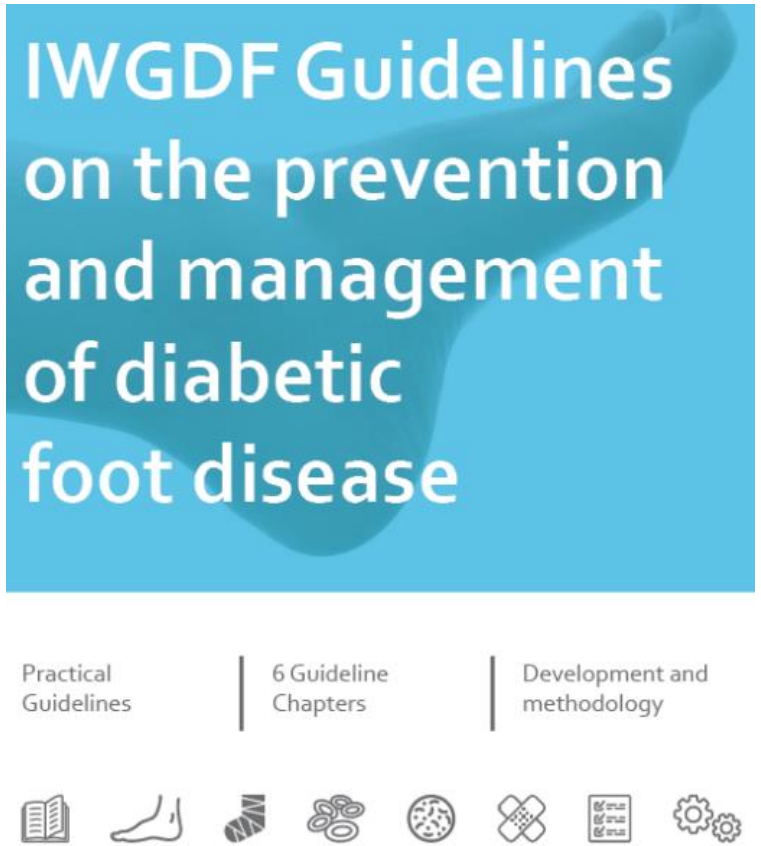
- Neuropathy
- PAD
- Foot deformity
- Cardiovascular risk Mgt: smoking; Tx HTN, control glycaemia, statin, low dose clopidogrel, aspirin
- Infection Mgt
- Offloading
- Wound care

[10] [11] [12] [13] [14]. The prognosis of a patient with diabetes, PAD and foot ulceration requiring amputation is worse than many common cancers – up to 50% of patients will not survive 5 years [4] [15].

CORNERSTONES OF FOOT ULCER PREVENTION

There are five key elements that underpin efforts to prevent foot ulcers:

1. Identifying the at-risk foot
2. Regularly inspecting and examining the at-risk foot
3. Educating the patient, family and healthcare professionals
4. Ensuring routine wearing of appropriate footwear
5. Treating risk factors for ulceration



https://diabeticfootaustralia.org

Refer in 2 days or less

- The ulcer less severe
- Healing is faster
- Less chance of infection

After 2 days

- Increase risk infection
- Hospitalization
- Amputation

Highriskfootpodiatryservice@health.qld.gov.au

New Guidelines - Diabetes Feet Australia

48yr T2 DM,
Neuropathic DFI
Admitted
28.11.14
MSSA
OT amp 2nd & 3rd toes
NPWTi 30/11-11/12
USWD 8 & 11/12/14
LOS 13 days
NPWT 4 weeks
Complete healing 24.3.15
3 months

2015

The use of negative pressure wound therapy as a dual closure and splinting device is associated with rapi primary wound closure in hig diabetic patients following di amputation: a case series

Iannella SM, McInnes W, Fitridge R & Dawson J

with steri-strips (Smith & Nephew, NSW, Australia) (Figure 1) after two or three days, and Mepitel™ silicone dressing (Mölnlycke Australia, NSW, Australia) was applied over the closure line and the base of the remaining open wound. A thin piece of Granufoam dressing (KCI Medical Australia, NSW, Australia) was placed on top, and further sealed with the film dressing. The T.R.A.C. Pad® (KCI Medical Australia, NSW, Australia) was located away from the wound site using film as an initial contact layer on the skin and a bridging piece of granufoam dressing, in order to remove undesirable pressure effects on tissues surrounding the wound (Figure 2). This offloading of the closure site is an essential aspect of wound care and facilitates appropriate healing, particularly in diabetic patients. In this way, the V.A.C.® (KCI Medical Australia, NSW, Australia) dressing had been applied to act as a closure and splinting device. We describe the outcomes of this approach in three cases of diabetic toe amputations. Informed consent was obtained from all participants.

Figure 1: Closure of wound with steri-strips three days postoperative first and second toe amputation

Figure 3: A: Ulcer at presentation; B, C: Wound following debridement and amputation of the 1st and 2nd metatarsals; D: Wound following V.A.C.® removal; E: Wound healing at 2-month follow-up

Patient 2 presented with a two-week history of a malodorous, deep necrotic foot ulcer overlying the right first metatarsal. Surgical management required debridement of the ulcer with amputation of the first metatarsal bone. V.A.C.® therapy was ceased after eight days and the patient discharged 11 days postoperatively. At follow-up after eight weeks the wound had healed.

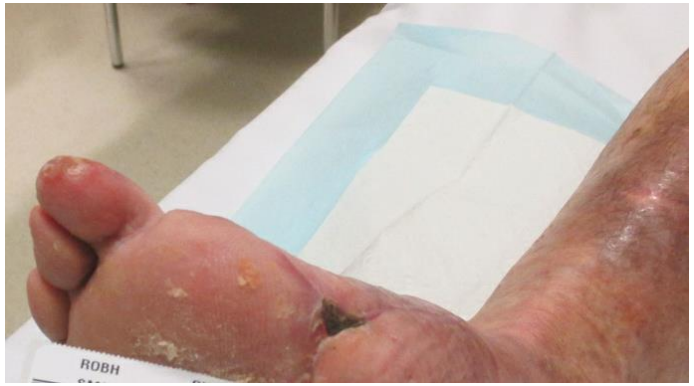
- 42yr T1 DM
- Admit; 14.11.15
- OT 16.11.15 Veraflo VAC &

USWD

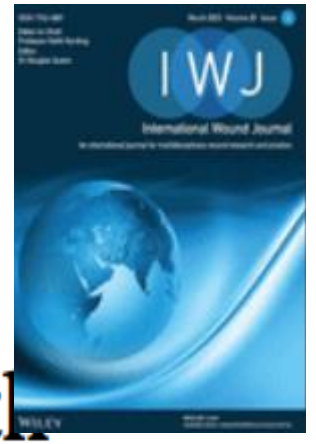
- LOS 6 days,
- 15 days TNP
- D/C 20.11.15
- **Healed 45 days**
- **NWB**
- **Podiatry**


02-JUN
ADM157


13/7/20
25/8/20
25/9/20


ROBH

Wang et al 2022 NPWTi vs NPWT



Clinical outcomes of negative pressure wound therapy with instillation vs standard negative pressure wound therapy for wounds: A meta-analysis of randomised controlled trials

Key points

1. This is the first meta-analysis conducted based on RCTs only for the efficacy of NPWT vs NPWTi.
2. NPWTi could decrease the number of surgeries and dressing changes.
3. NPWTi showed a smaller wound area after treatment.
4. No significant difference was observed on complications between NPWTi and NPWT.


12/5/22
24/6/22
19/8/22

Peripheral Neuropathy + PAD + foot deformity =

Infection 27 recommendations
13 Wound Healing Interventions

27b	do not routinely use topical antiseptics, silver preparations, honey, bacteriophage therapy, or negative pressure wound therapy (with or without instillation). (Weak; low)

1. Sharp debridement; slough, necrotic tissue, callus **Strong / Low**
2. Don’t use antimicrobials solely to accelerate healing **Strong / Low**
3. Consider Use Sucrose octasulfate Dressings **Weak / Moderate**
4. Consider HBO **Weak / Moderate**
5. Consider NPWT to reduce wound size & post op **Weak / Low**
6. Consider Placenta, autologous leucocyte platelet and fibrin **Weak/ Low**
7. Not to use physical environment altering agents ; electricity, magnetism, Ultrasound, shockwaves in preference to standard car **Weak / Low**

Plastic Surgery
2017, Vol. 25(1) 21-26

DOI: 10.1177/2292550317693813
journals.sagepub.com/home/psg
SAGE

Low-Frequency Ultrasound Debridement in Chronic Wound Healing: A Systematic Review of Current Evidence

Le débridement par ultrasons à basse fréquence pour la cicatrisation des plaies chroniques : une analyse systématique des données probantes à jour

Ying-Ju Ruby Chang, MSc[1], Julie Perry, PhD[1], and Karen Cross, MD, PhD[1]

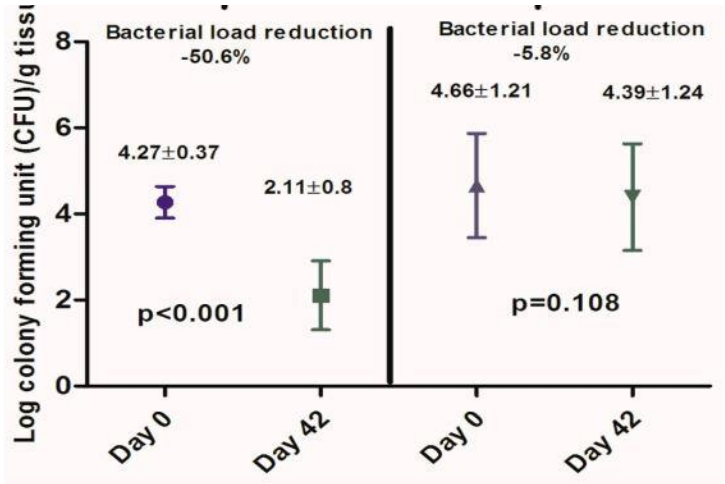


Figure 6. Comparison of bacterial loads in diabetic foot ulcer tissue samples at patient inclusion (Day 0) and after six-week treatment period (Day 42) after UAW or surgical debridement.

Review

Ultrasound-Assisted Wound (UAW) Debridement in the Treatment of Diabetic Foot Ulcer: A Systematic Review and Meta-Analysis

Sebastián Flores-Escobar [1,2], Francisco Javier Álvaro-Afonso [1,2,*], Yolanda García-Álvarez [1,2], Mateo López-Moral [1,2], José Luis Lázaro-Martínez [1,2] and Esther García-Morales [1,2]

[1] Diabetic Foot Unit, Clínica Universitaria de Podología, Facultad de Enfermería, Fisioterapia y Podología, Universidad Complutense de Madrid, 28040 Madrid, Spain; jhflores@ucm.es (S.F.-E.); ygarci01@ucm.es (Y.G.-Á.); matlopez@ucm.es (M.L.-M.); diabetes@ucm.es (J.L.L.-M.); eagarcia@ucm.es (E.G.-M.)
[2] Instituto de Investigación Sanitaria del Hospital Clínico San Carlos (IdISSC), 28040 Madrid, Spain
* Correspondence: alvaro@ucm.es; Tel.: +34-91-394-13-64 or +34-64673372

Journal of *Clinical Medicine*
MDPI

Article

Cellular Proliferation, Dermal Repair, and Microbiological Effectiveness of Ultrasound-Assisted Wound Debridement (UAW) Versus Standard Wound Treatment in Complicated Diabetic Foot Ulcers (DFU): An Open-Label Randomized Controlled Trial

José Luis Lázaro-Martínez [1,2], Francisco Javier Álvaro-Afonso [1,2,*], David Sevillano-Fernández [3], Yolanda García-Álvarez [1,2], Irene Sanz-Corbalan [1,2] and Esther García-Morales [1,2]

08am

11/2/22 – 24/2/22




2nd Feb – 31st May

NP/Surgeon/ Podiatry/GP
Monitoring MDT
6 USWD 3 weeks VAC

ED
Neuro-ischaemia
Vascular

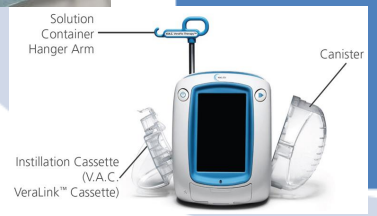
OT / Angio

Return
OPD ongoing care 1/52 USWD 2x /52 TNP
NWB / W/C Podiatry

D.A.W.S.C

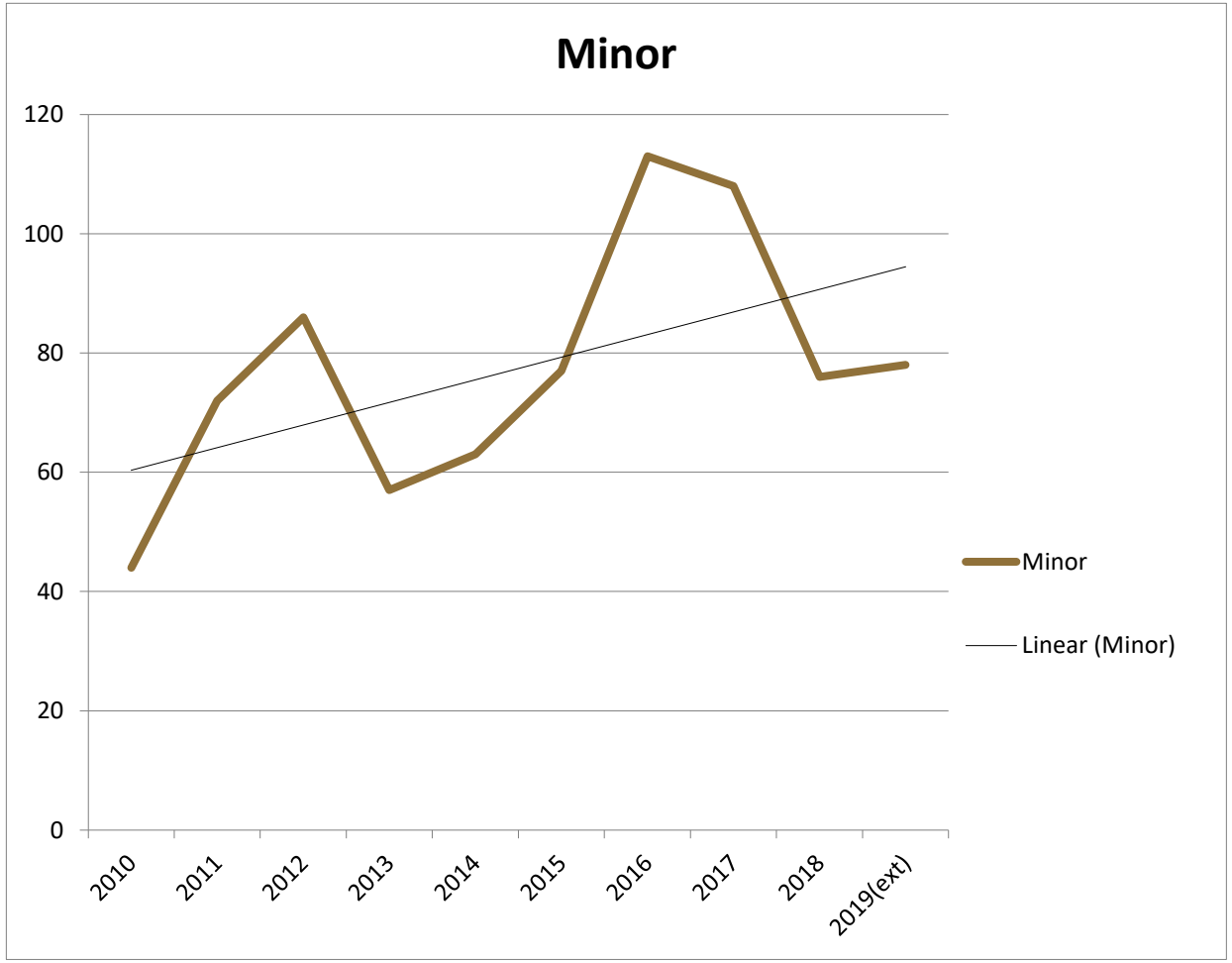
Ward /24 hrs
Silvercel

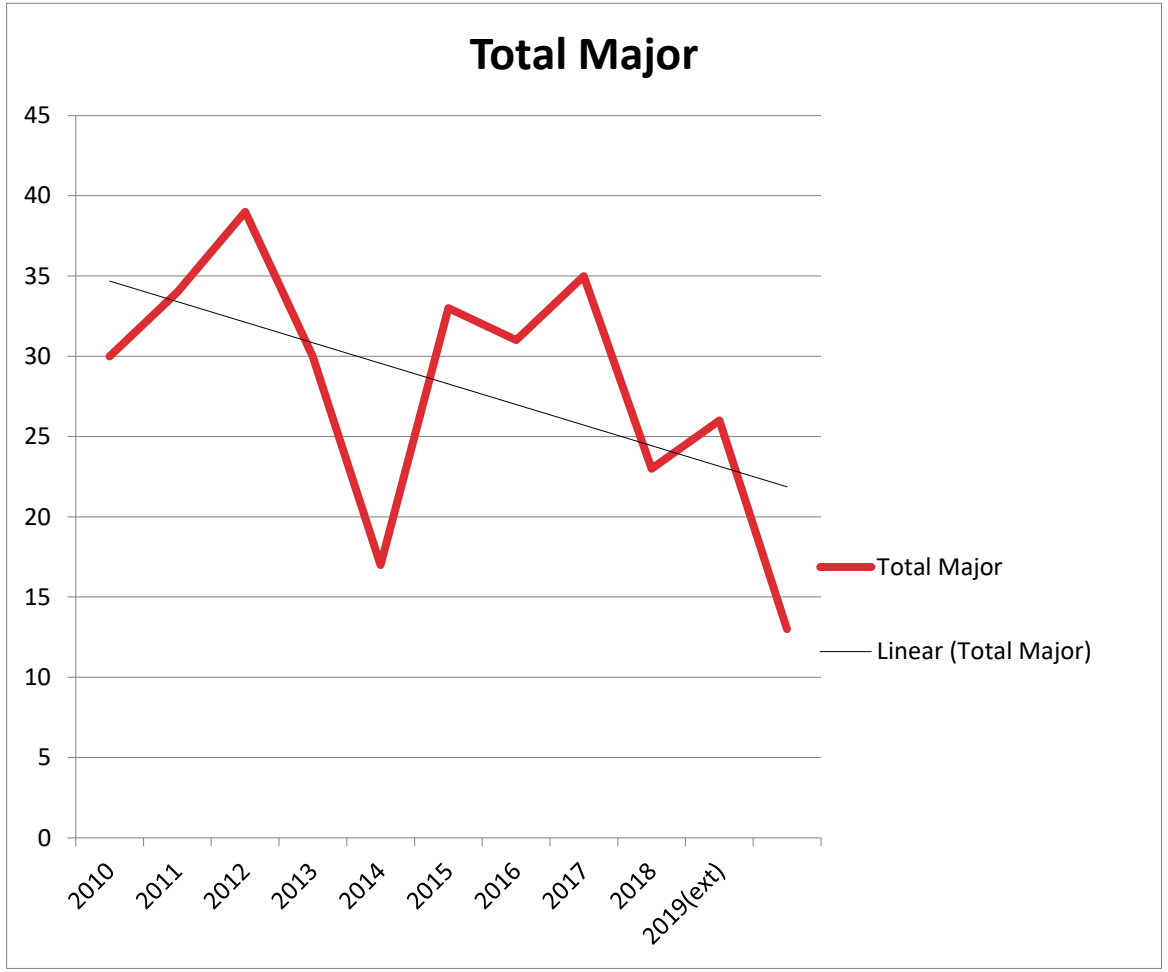
TNPI + USWD
1-7 days



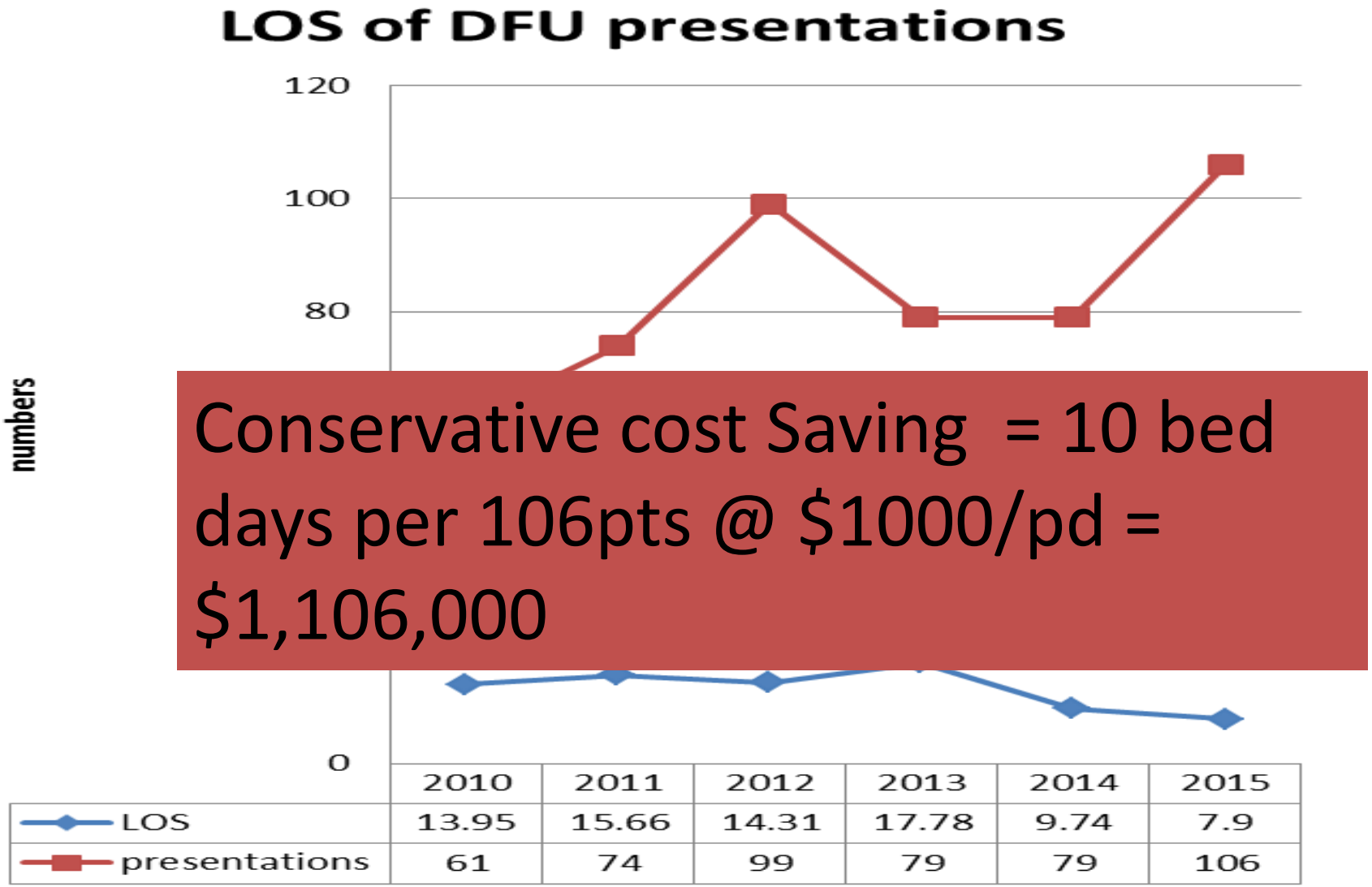
V.I.P.S need I.D.s


PRESSURE REDUCING MA


Minor
120
100
80
60
40
20
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019(ext)
Minor
Linear (Minor)


Total Major
45
40
35
30
25
20
15
10
5
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019(ext)
Total Major
Linear (Total Major)

AVA Database DM debridement, Drainage, Minor amputation



	2010	2011	2012	2013	2014	2015
LOS	13.95	15.66	14.31	17.78	9.74	7.9
presentations	61	74	99	79	79	106

Arterial

- Pain
- Pulseless
- Pallor
- Paresthesia
- Punched out
- Deep

Arterial scan
CTA
MRA

Refer

Painless Dressing

Horizontal or
Dependent

Which of these does not require Revascularisation?

A)

B)

C)

D)

40yr T2DM
Thromboangitis Obliterans

Full Compression is indicated for patients with an ABPI between 0.8 to 1.2 ?

- TRUE
- FALSE

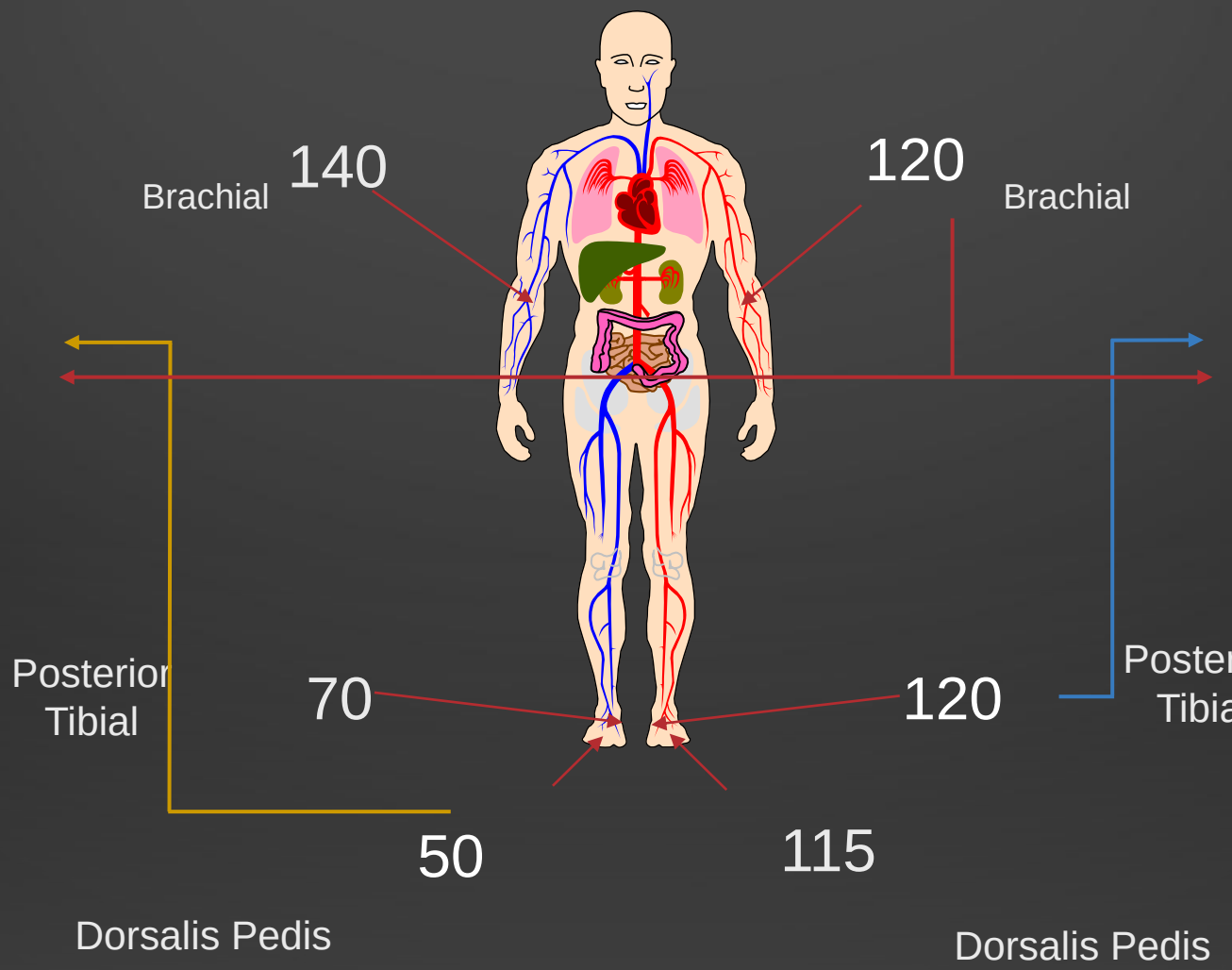
For referencing Team V et al. Ankle Brachial Pressure Index and compression application: Review summary. WP&R Journal 2019; 27(2):108-111.

HOW TO CALCULATE THE ABPI

R) ABPI

$\frac{70}{140}$

= 0.5



L) ABPI

$\frac{120}{120}$

= 1.0

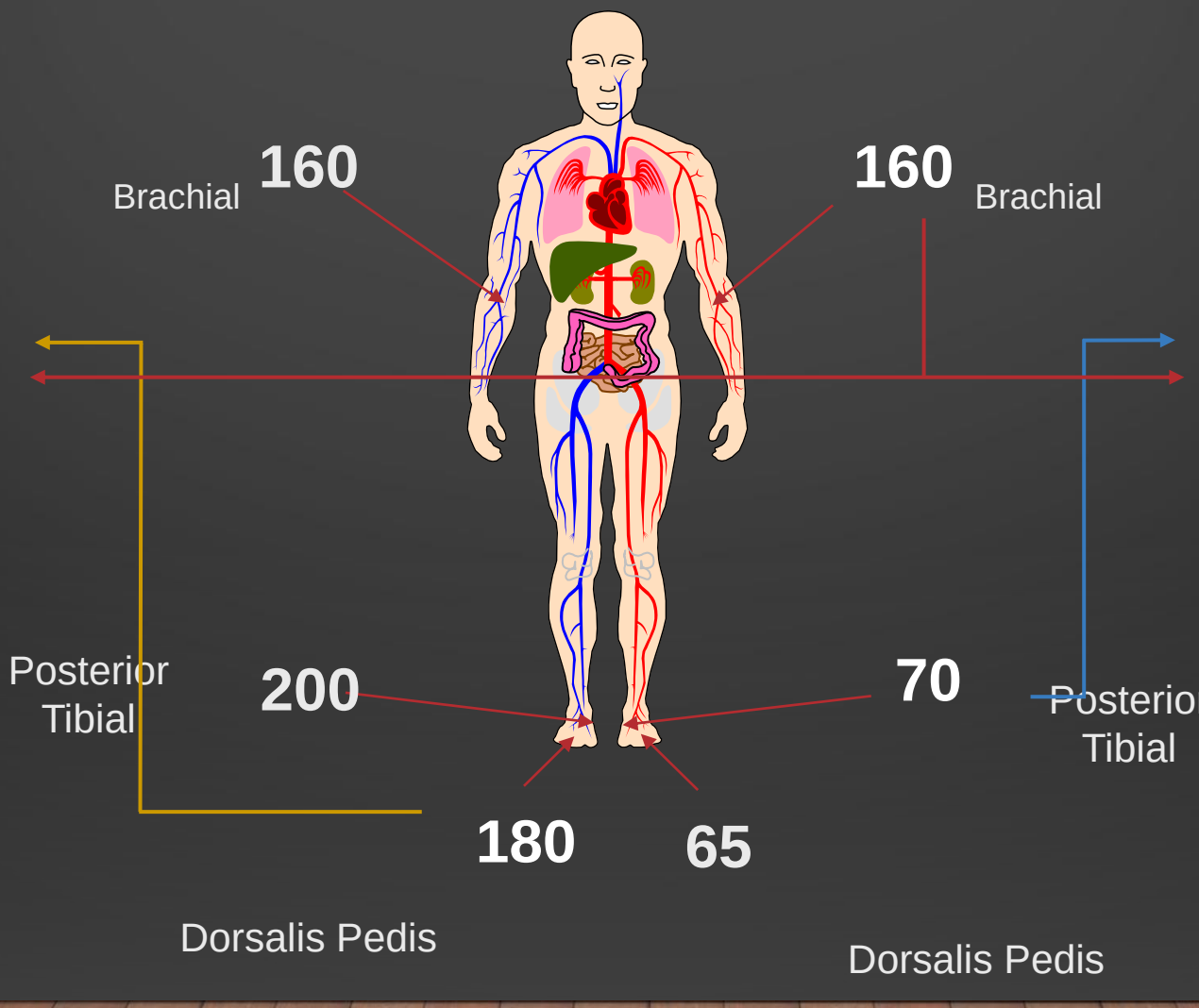
Belch JJF *et al. Arch Int Med* 2003; 163: 884-92; Hiatt WR. *N Engl J Med* 2001; 344: 1608-21.

HOW TO CALCULATE THE ABPI

R) ABPI

$\frac{200}{160}$

= 1.25

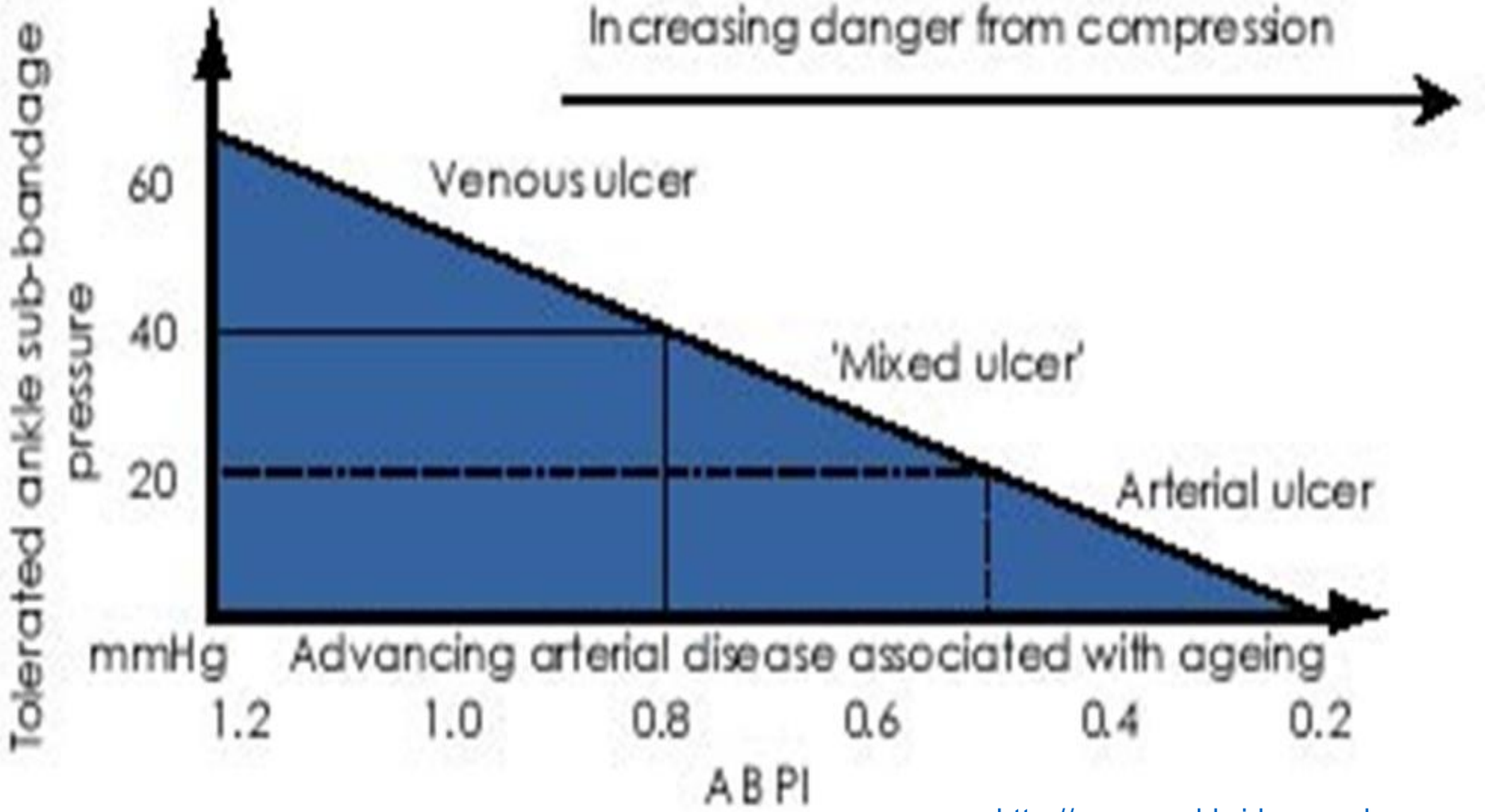


L) ABPI

$\frac{70}{160}$

= 0.43

Belch JJF *et al. Arch Int Med* 2003; 163: 884-92; Hiatt WR. *N Engl J Med* 2001; 344: 1608-21.



http://www.worldwidewounds.com

ABPI 1.2

What is the best choice?

a) Full compression
b) Light Compression
c) Tubigrip graduated
d) Tubigrip Single

Need to consider

- a) neuropathy
- b) HF
- c) pain
- d) tolerance

11610

Group	D1 - Miscellaneous Diagnostic Procedures And Investigations
Subgroup	5 - Vascular

MEASUREMENT OF ANKLE: BRACHIAL INDICES AND ARTERIAL WAVEFORM ANALYSIS, measurement of posterior tibial and dorsalis pedis (or toe) and brachial arterial pressures bilaterally using Doppler or plethysmographic techniques, the calculation of ankle (or toe) brachial systolic pressure indices and assessment of arterial waveforms for the evaluation of lower extremity arterial disease, examination, hard copy trace and report.

Fee: $65.70 **Benefit:** 75% = $49.30 85% = $55.85

OEDEMA MGT VEINS

Which of these would you deem Venous ?

A)

B)

C)

D)

- Shapely
- Chronic inflammatory changes of skin
- Peau d orange
- Bubbling
- Thickening
- Deep skin folds
- Ulcers, Exudate
- Itch / scaley
- Staining
- Venous / Lymph
- chronic edema

Causes of VLU / CVI

- Damage valves :

Principles of compression in venous disease: a practitioner's guide to treatment and prevention of venous leg ulcers. Wounds

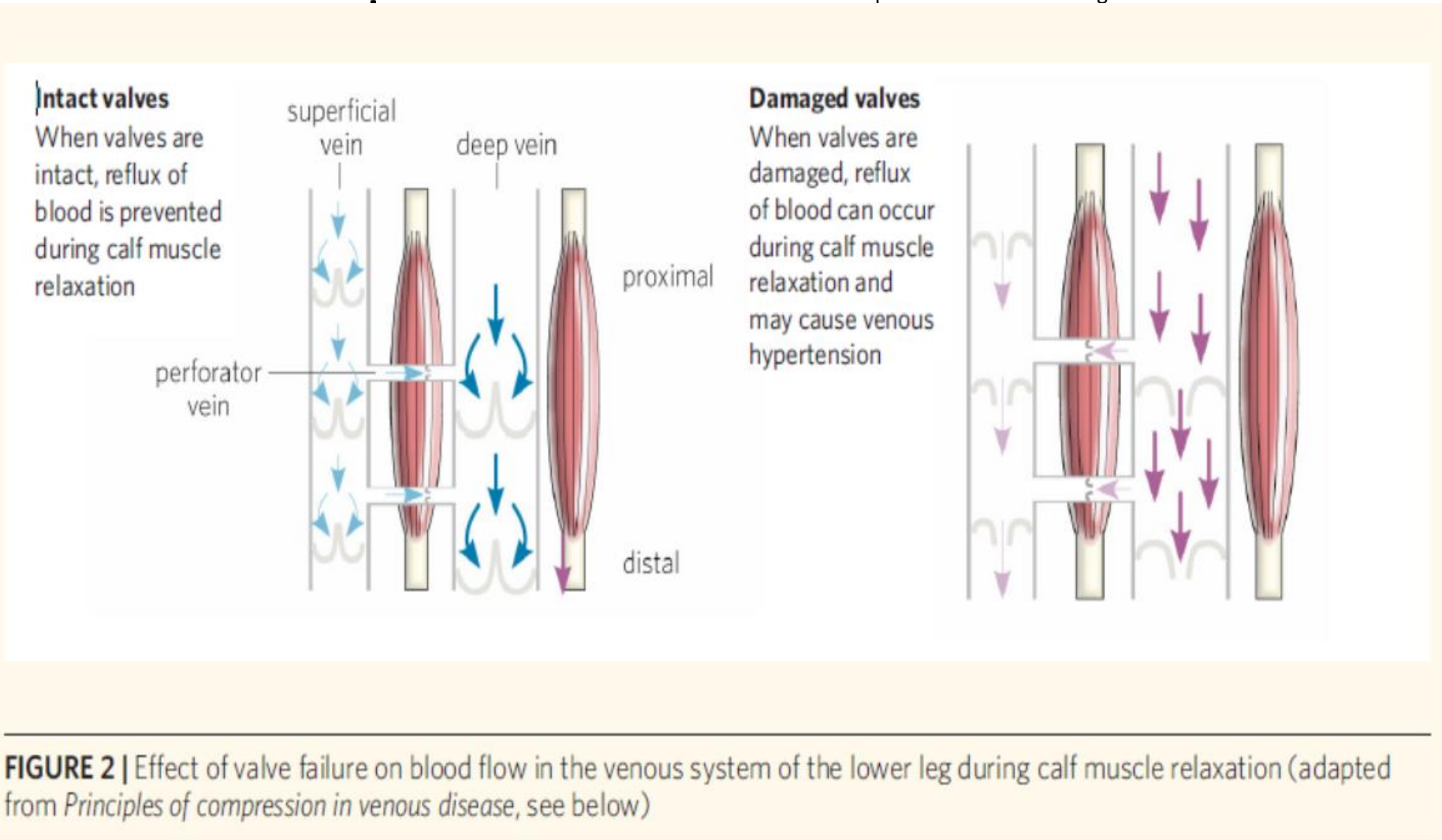


FIGURE 2 | Effect of valve failure on blood flow in the venous system of the lower leg during calf muscle relaxation (adapted from *Principles of compression in venous disease*, see below)

Venous Skin Changes

<u>Ankle Flare</u>

Pooling /stretching veins

<u>Hyperpigmentation</u>

Skin colour changes

<u>Varicose Eczema</u>

Itchy flakey

Clinical*

- C_0 - No clinical signs
- C_1 - Small varicose veins
- C_2 - Large varicose veins
- C_3 - Edema
- C_4 - Skin changes without ulceration
- C_5 - Skin changes with healed ulceration
- C_6 - Skin changes with active ulceration

Etiology*

- E_C - Congenital
- E_P - Primary
- E_S - Secondary
  (usually due to prior DVT)

Anatomy*

- A_S - Superficial veins
- A_D - Deep veins
- A_P - Perforating veins

Pathophysiology*

- P_R - Reflux
- P_O - Obstruction

"Early application of compression should be performed to correct swelling and progressive scarring and to initiate the healing process by improving the venous microcirculation."

Kistner R. Specific Steps to Effective Management of Venous Ulceration. Supplement to Wounds June 2010.

*Fronek HS, Bergan JJ, et al. The Fundamentals of Phlebology: Venous Disease for Clinicians. 2004. pg 151.

Clinical Classifications with examples

C_1 - telangiectasias or reticular veins

C_2 - varicose veins

C_3 - edema & corona

C_4 - lipodermato-sclerosis and eczema

C_5 - ulcer scar

C_6 - active ulcer

GoodRX Health

1) Amlodipine / Diltiazem / Cardizem / Adalat

- Amlodipine (Norvasc) HTN. One in 10 patients experience swelling when taking amlodipine at a dose of 10 mg daily.
- F vs M 3 x more likely

2) Gabapentin

- Gabapentin (Neurontin) is used to treat nerve pain, which often occurs after shingles (known as postherpetic neuralgia) or as a result of nerve damage from diabetes (diabetic peripheral neuropathy). Gabapentin is known to cause lower leg swelling. In studies on patients with shingles, swelling appeared in 8% of the patients taking gabapentin.

3) Pregabalin

- Pregabalin (Lyrica) may also cause swelling in the feet and legs. Pregablin is similar to gabapentin in that it is prescribed for nerve pain. But it's also used in patients with spinal cord injury, seizures, or fibromyalgia.

4) NSAIDs

- Non-steroidal anti-inflammatory drugs (NSAIDs) like ibuprofen (Motrin, Advil) and naproxen (Aleve) are popular over-the-counter medications used for pain and inflammation. They are a well-known cause of swelling due to salt retention. In this case, the swelling is typically mild and will go away when you stop taking the medication.

- **5) Oral contraceptives**
- The estrogen component of some oral contraceptive pills can cause swelling. Estrogen can increase your risk of a blood clot in the leg (deep vein thrombosis), This is an urgent medical issue. However, estrogen can also cause swelling in both legs, which is usually not an emergency.
- If you notice swelling and you're taking a birth control pill, be sure to seek medical attention right away. You may also want to look into a progesterone-only option after your doctor has determined you don't have deep vein thrombosis.
- **6) Oral steroids**
- Oral steroid medications like prednisone are often prescribed for asthma, worsening COPD (chronic obstructive pulmonary disorder), severe allergic reactions, or other autoimmune diseases. Prednisone causes salt retention, which may lead to swelling in the legs and feet.
- **7) Pioglitazone and rosiglitazone**
- Pioglitazone (Actos) and rosiglitazone (Avandia) are medications used to treat type 2 diabetes. Leg swelling is a well-known side effect of both meds, so if you experience swelling while taking them, ask your doctor about switching to another medication.

Education anyone?

ABC model for leg ulcer management

This document aims to clarify best practice in the assessment and management of leg ulcers around three main steps: **A B C** (Figure 3).

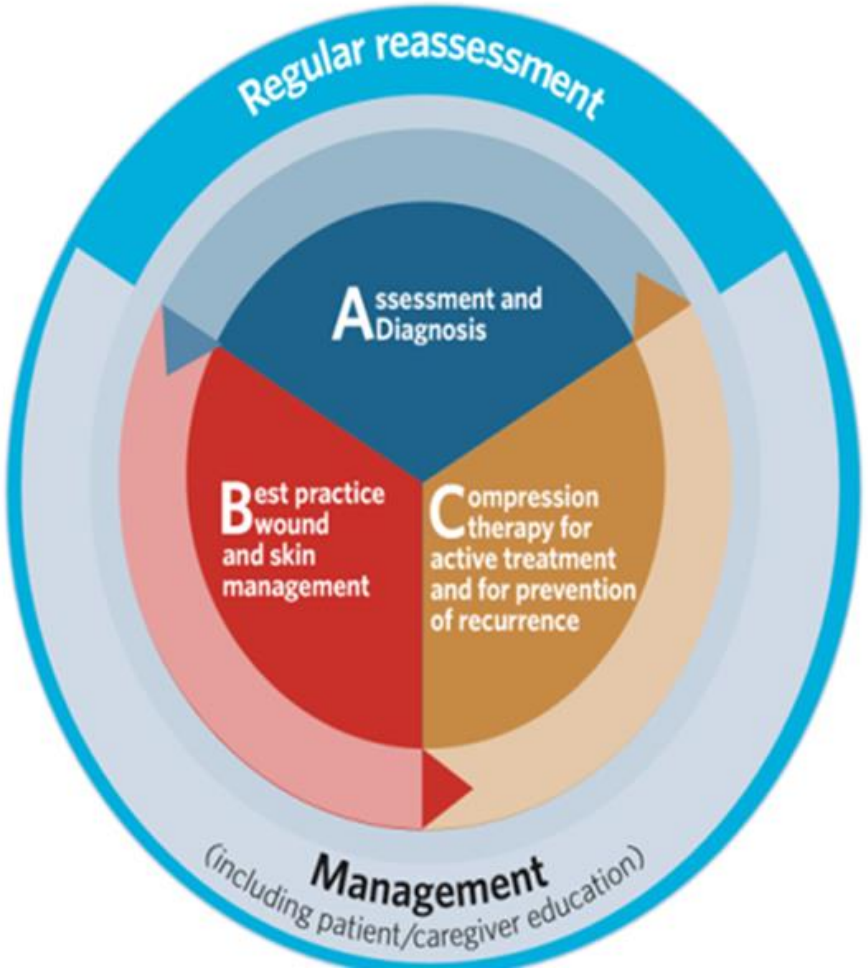
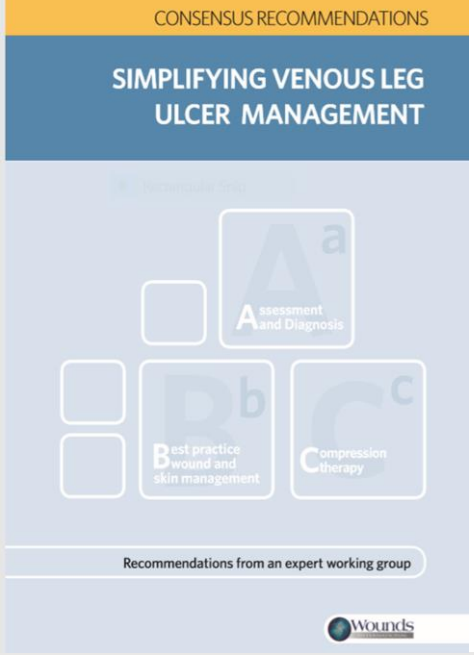


FIGURE 3 | Overview of the ABC model of assessment and management of leg ulcers



; specialist clinics about 45–70%[19,20]

.4 months for mixed aetiology ulcers[21]

have been reported up to 60 months[4]

Ulcer/ Assessment

- History; start, duration, recurrent, meds
- Examination; characteristics; veins, eczema, shape, location, depth, oedema, pulses
- Investigation; ABPI, xray, biopsy, duplex
- Diagnosis; Venous / mixed/ arterial or other
- Intervention; plan of care

Management; Compression ,dressing , debride, educate

Referral; Surgeon, dermatology, plastics, OT

LDS

- Subcut fibrosis
- Hard / thick ankles
- Venous outflow obstruction
- Incompetent valves
- Calf Mx Dysfunctiom

Concluded: SVR surgery correction + compression doesn't improve healing but reduces recurrence at 4 yrs (more ulcer free time)

BMJ

RESEARCH

Long term results of compression therapy alone versus compression plus surgery in chronic venous ulceration (ESCHAR): randomised controlled trial

Manjit S Gohel, specialist registrar,[1] Jamie R Barwell, consultant vascular and transplant surgeon,[2] Maxine Taylor, leg ulcer nurse specialist,[1] Terry Chant, vascular nurse specialist,[3] Chris Foy, medical statistician,[4] Jonothan J Earnshaw, consultant surgeon,[5] Brian P Heather, consultant surgeon,[5] David C Mitchell, consultant surgeon,[3] Mark R Whyman, consultant surgeon,[1] Keith R Poskitt consultant surgeon[1]

- **ESCHAR study (Gohel MS, Barwell JR, Taylor M et al) 2007**
- 89% healing at 3 years for the compression group
- 93% for the compression + surgery group.
- 56 % recurrence at 4 years for the compression group
- 31% for compression plus surgery group

2018 EVRA trial

ORIGINAL ARTICLE

A Randomized Trial of Early Endovenous Ablation in Venous Ulceration

Manjit S. Gohel, M.D., Francine Heatley, B.Sc., Xinxue Liu, Ph.D., Andrew Bradbury, M.D., Richard Bulbulia, M.D., Nicky Cullum, Ph.D., David M. Epstein, Ph.D., Isaac Nyamekye, M.D., Keith R. Poskitt, M.D., Sophie Renton, M.S., Jane Warwick, Ph.D., and Alun H. Davies, D.Sc., for the EVRA Trial Investigators*

SVR treated early

With Endovenous ablation = faster healing of VLU and more free healing times than those deferred.

85.6 % in 24 wks early vs

73.6 % in deferred

57yr F Skin Tear + Signs Venous Insufficiency 6/2/20

VEINS

- Endovenous radiofrequency ablation of long saphenous vein
- With avulsions

Post Thrombotic Syndrome

- 20 to 50 % PTS with LEDVT within 2 yrs – 10 yr
- Post Diagnosis stockings can reduce symptoms
- Severe debilitating pain, skin changes, heamosiderin, swelling, impairs Qol
- Recurrent ulcers

PTS
59yr F
PE / DVT L) leg

- 7/2/20

Full Compression is indicated for patients with an ABPI between 0.8 to 1.2 ?

- TRUE
- FALSE

For referencing Team V et al. Ankle Brachial Pressure Index and compression application: Review summary. WP&R Journal 2019; 27(2):108-111.


smith&nephew
PICO°
Single Use
Negative Pressure
Wound Therapy System


Coban 2

Hands On compression

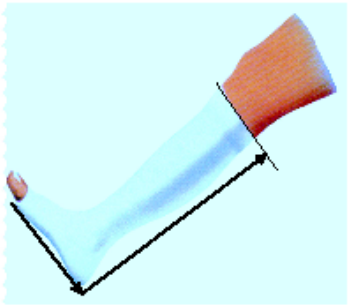
"And as if that wasn't bad enough. They've just discovered that I'm allergic to bandages!"

Lymphoedema /Lymphorrhea

3 layers of straight elasticated b

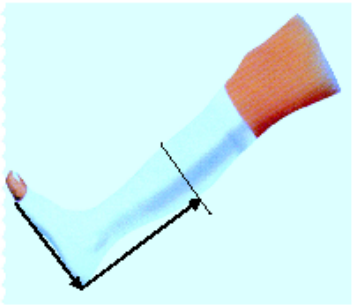
Application of 3 layer compression bandaging with Tubular Form™ tubular compression bandage

LAYER 1



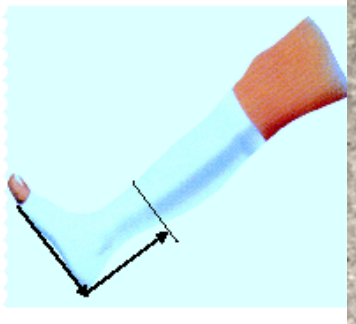
LAYER 1 RUNS FROM THE BACK OF THE TOES TO THE BACK OF THE KNEE, 2 FINGERS DOWN

LAYER 2



LAYER 2 RUNS FROM THE BACK OF THE TOES TO MID CALF

LAYER 3



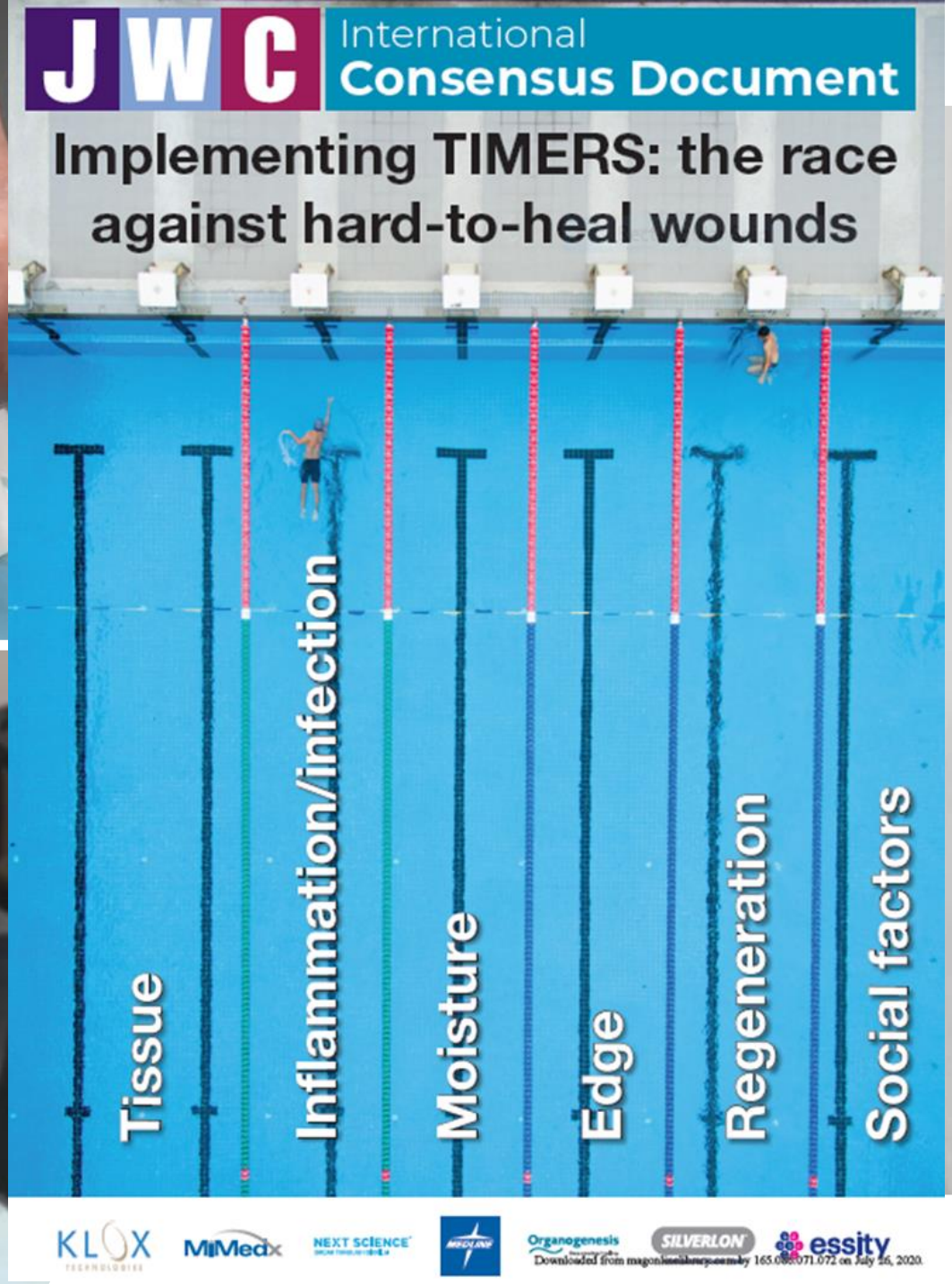
LAYER 3 RUNS FROM THE BACK OF THE TOES TO MID POINT BETWEEN MID CALF AND THE ANKLE

- Always measure smallest circumference (ankle) to select the correct Tubular Form™ bandage size
- Measure bandage length from the back of the toes around the heel to desired length along the leg
  - If patient is uncomfortable remove one layer to still maintain compression treatment
  - 2 layers of Tubular Form will provide approximately 18 - 22mmHg
  - Always consult physician if unsure of patient's vascular condition

Sutherland Medical Pty Lim

https://www.youtube.com/watch?v=2Pbla39FPWM

1) History
2) Examination
3) Investigations
4) Diagnostics
5) Intervention
6) Concordance
7) Evaluation



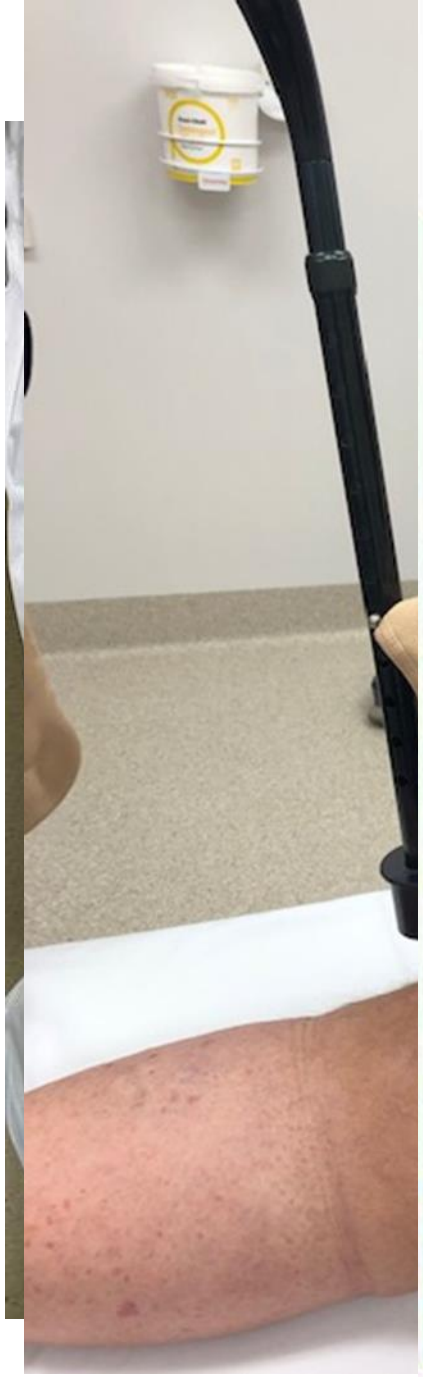
Compression uses

- Oedema / Lymphoedema
- Venous
- Mixed
- Cellulitis
- Prevent DVT / Post DVT & PTS
- Skin tears / lacerations
- Holding the DFU together

ABPI should be between?

4 Activities of Wound Hygiene ?

- Cleanse
- Debride
- Refashion the wound edge
- Dress the wound




TAKING MY PATIENTS SOCKS
OFF... SKIN CELLS BE LIKE
@snarkynurses

BED 0436
HOWARD WRIGHT

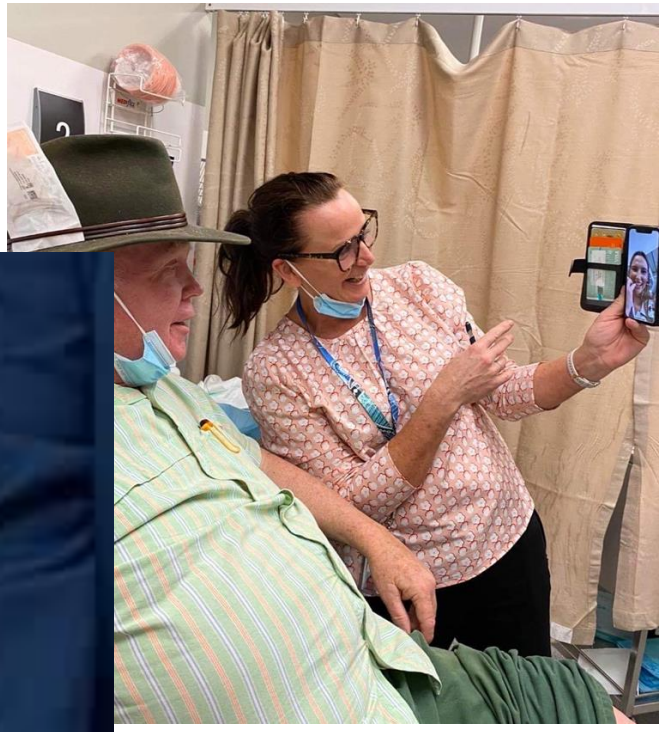
Contents lists available at ScienceDirect

Collegian

journal homepage: www.elsevier.com/locate/coll

Improving patient outcomes by coaching primary health general practitioners and practice nurses in evidence based wound management at on-site wound clinics

K. Innes-Walker[a,b], C.N. Parker[a,b,*], K.J. Finlayson[a,b], M. Brooks[c], L. Young[d], N. Morley[e], D. Maresco-Pennisi[f], H.E. Edwards[a,b]



Consumer Group

The Wound Survival Guide

GCUHwound.care@health.qld.gov.au (GCUH wound referrals)

Ph 0427802340

Nicola.morley@health.qld.gov.au (Public GCUH / Robina)

Ph 0431492179

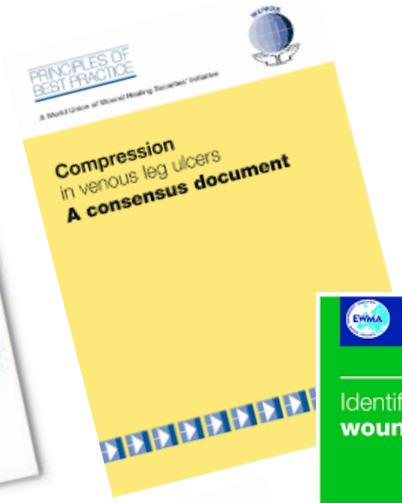
highriskfootpodiatryservice@health.qld.gov.au (podiatry)

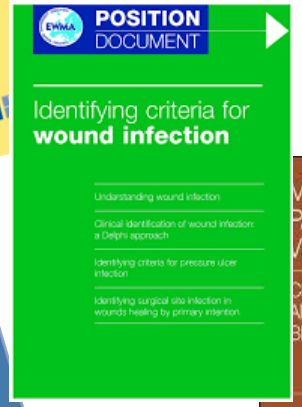
gcphn.org.au website (Complex Wound Clinic | Bundall Medical Centre)

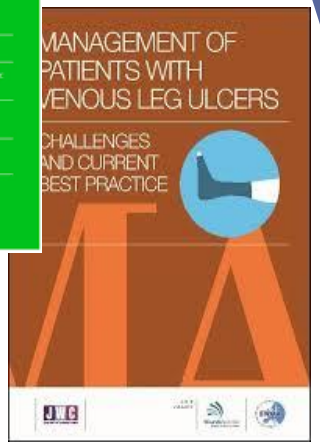
woundtherapies@gmail.com (RACF reviews)

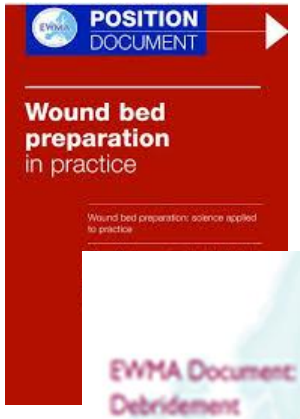
www.nicolamorley.com.au

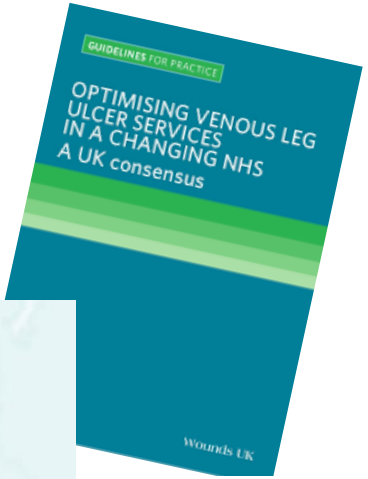
Best Practice Guidelines

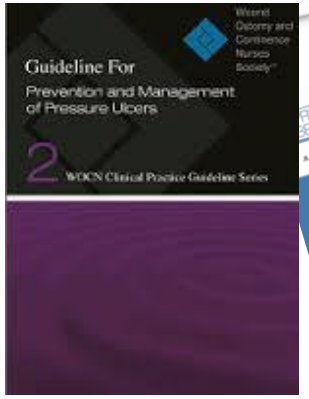


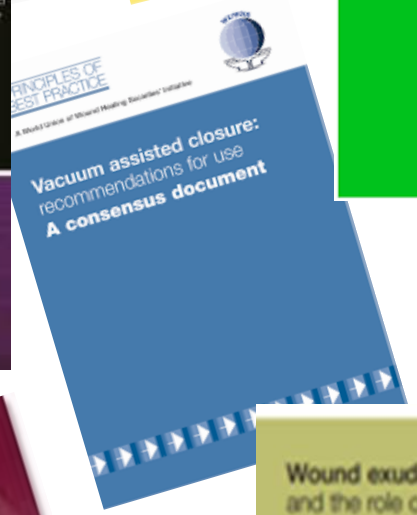


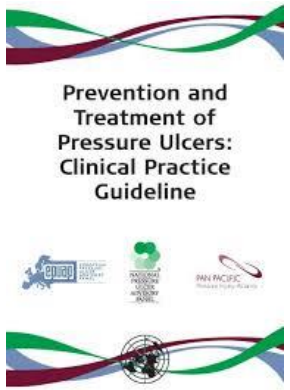


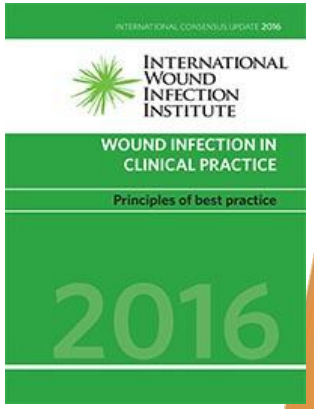




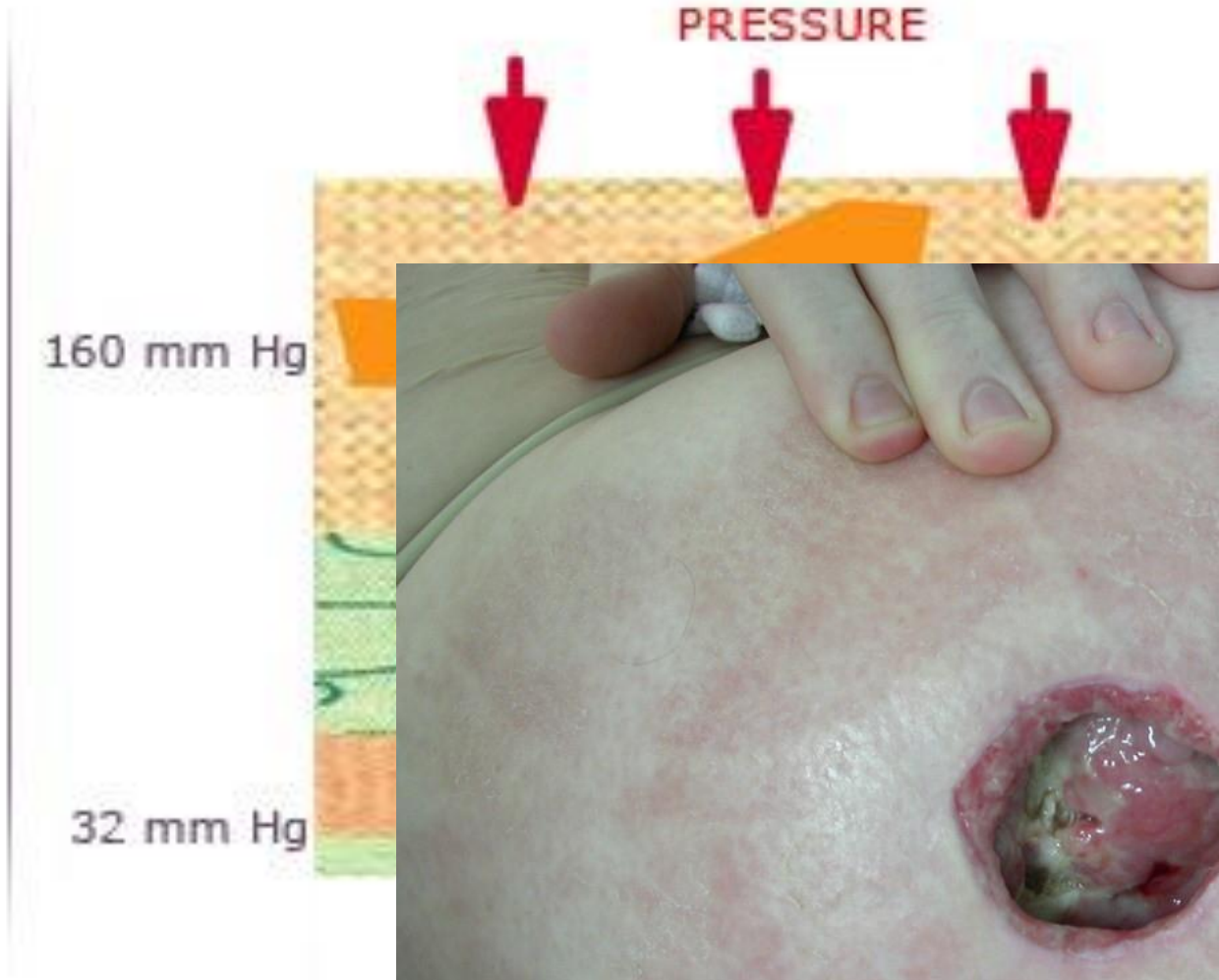








Courtesy of C.Torrance Pressure Injury Prevention Program



- It ha a major
  caus ally and that
  mar

Pressure

A.1

B.2

C.3

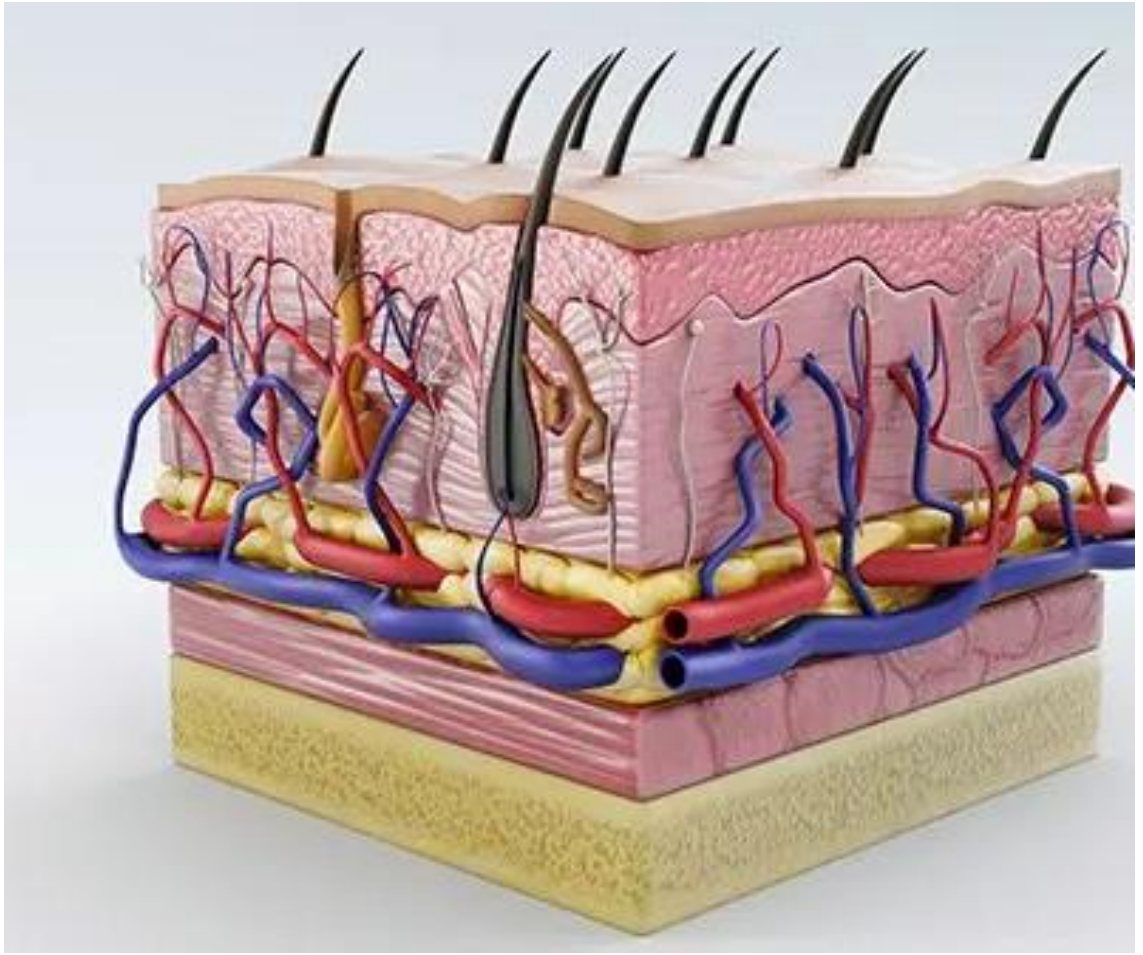
D.4

E.Unstageable

F.Suspected Deep Tissue

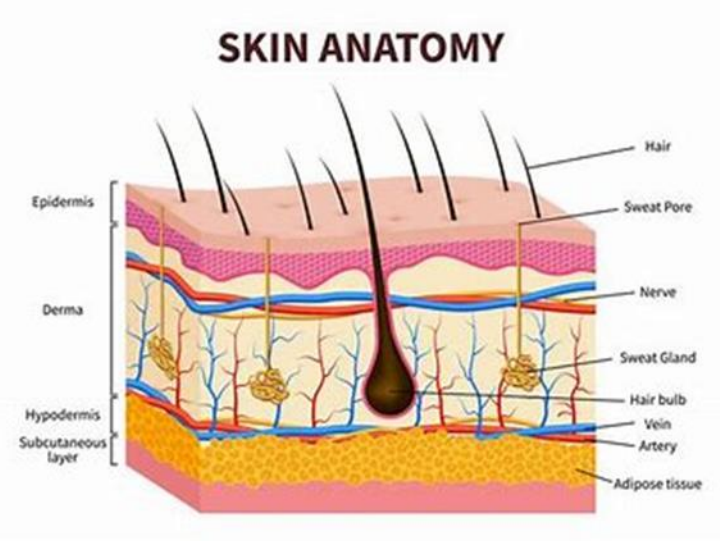
1) Name the 7 layers of the skin

1. Stratum Corneum
2. Stratum Lucidium
3. Stratum Granulosum
4. Stratum Spinosum (dendritic cells part of immune system to fight off infection)
5. Stratum Basale (mitosis occurs, keratin protein fat and produce Vit D, melanocytes here)
6. Papillary layer (connects dermis to epidermis capillaries regulates temperature; fingerprints)
7. Reticular layer (deepest dermal hair follicale sweat sebaceous glands, connective tissue)



2) A 1CM X 1CM PIECE OF SKIN IN FOREARM HAS

1. A) 100000 B) 200000 C) 300000 EPIDERMAL CELLS
2. A) 1.7 B) 2.7 C) 3.7 METRES OF NREVE
3. A) 0.9 B) 1.5 C) 2.2 METERS OF BLOOD VESSELS
4. A) 5 B) 10 C) 15 SEBACEOUS GLANDS
5. A) 50 B) 100 C) 150 SWEAT GLANDS



3). WHICH OF THE FOLLOWING CHARACTERIZES THE APPEARANCE OF A VENOUS LEG ULCER

A. SHALLOW WITH REGULAR MARGINS

B. SHALOW WITH IRREGULAR WOUND MARGINS

C. DEEP WITH REGULAR WOUND MARGINS

D. DEEP WITH IRREGULAR WOUND MARGINS

4. WHICH OF THE FOLLOWING IS CONSIDERED THE "GOLD STANDARD" TO TREAT VENOUS LEG ULCERS?

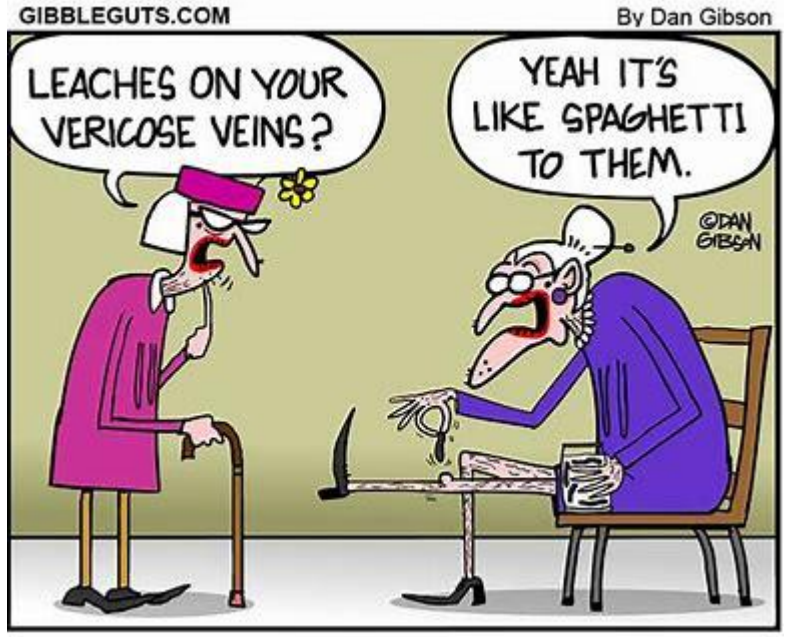
A. ALGINATE DRESSINGS

B. ELEVATION

C. ANTIMICROBIALS

D. COMPRESSION THERAPY

E. RADIOFREQUENCY ABLATION



5. WHICH OF THE FOLLOWING IS NOT TRUE OF A VENOUS LEG ULCER?

A. SHALLOW

B. FULL THICKNESS SKIN LOSS

C. HAEMOSIDERIN

D. PULSES PRESENT

E. IRREGULAR SHAPED

6) WHAT IS NOT A PHASE OF WOUND HEALING?

A) MATURATION

B) HAEMOSTASIS

C) INFECTION

D) INFLAMMATION

E) PROLIFERATION

7) MR D IS EXPERIENCING WHAT KIND OF EXUDATE FROM HIS WOUND IF IT APPEARS CLEAR AND WATERY ?

- A) SEROUS
- B) SANGUINEOUS
- C) SEROSANGUINEOUS
- D) PURULENT

8) WHAT DOES THE ACRONYM “T.I.M.E.R.S” STAND FOR?

A) TISSUE, IMPROVEMENT, MANAGEMENT, EDUCATION, REPAIR, SALVAGE

B) TISSUE, INFECTION / INFLAMMATION, MOISTURE CONTROL, EDGE MIGRATION, REGENERATION, SOCIAL FACTORS

C) THERAPY, INFECTION / INFLAMMATION, MOISTURE CONTROL, EDUCATION, REMODEL, SOCIAL FACTORS

D) THERAPY, IMPROVEMENT, MANAGEMENT, EDGE MIGRATION, RENEWAL, SALVAGE

9) WHICH OF THESE WOULD YOU DEEM TO BE VENOUS?

A)

B)

C)

D)

10) AN ATYPICAL WOUND MAY BE SUSPECTED IF ?

A) The wound has rapidly increased in size in a short period

B) The wound is extremely painful

C) The wound has an abnormal location

D) The wound has not healed with good treatment within 16 weeks

E) All of the above

11) WHICH OF THESE WOULD YOU NOT ADMIT TO HOSPITAL?

A)

B)

C)

D)

12) WHICH OF THE FOLLOWING IS NOT IMORTANT IN MANAGING THIS WOUND ?

- A) CALLUS REMOVAL
- B) OFFLOADING FOOTWEAR
- C) VENOUS DUPLEX SCAN
- D) PODIATRIST
- E) BGL MONITORING

13) NAME THE PULSES ?

A POSTERIOR TIBIALIS B DORSALIS PEDIS C POPLITEAL D) FEMORAL




14) COBAN FULL APPLIES 40MMHG COMPRESSION

- A) TRUE
- B) FALSE

THE END

Scores

- EVALUATION FORMs please