Wound bed preparation

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WOUND-BED PREPARATION

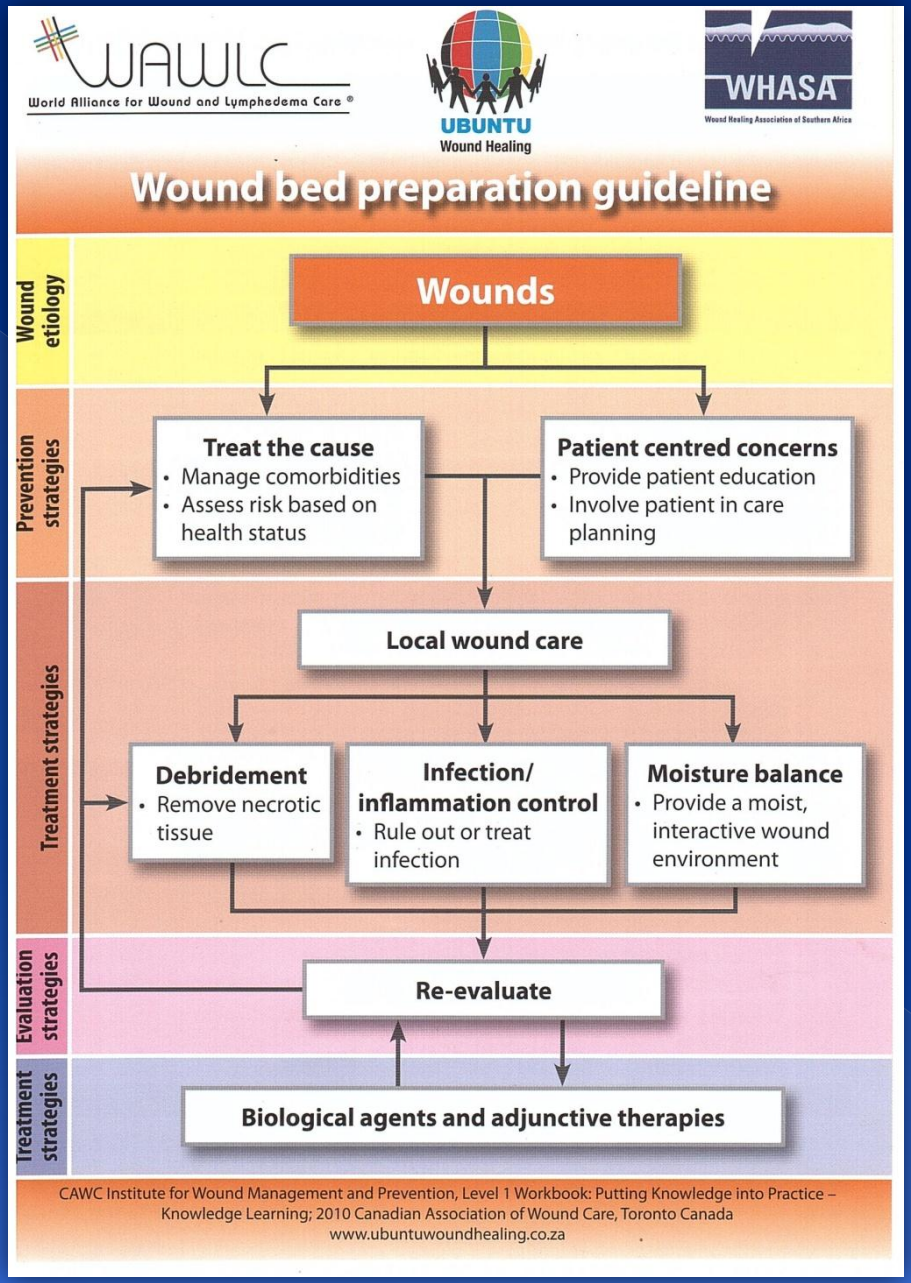
"the management of a wound to accelerate endogenous healing or to facilitate the effectiveness of other therapeutic measures

(Schultz GS et al (2003).Wound Repair Regen 11 (Suppl 2)

WOUND CLEANING

"a process that removes these less adherent inflammatory contaminants from the wound surface and renders the wound less conducive to microbial growth"

Gardner SE, Frantz RA (2004) Wound Bioburden


WAWLC
World Alliance for Wound and Lymphedema Care
UBUNTU
Wound Healing
WHASA
Wound Healing Association of Southern Africa
Wound bed preparation guideline
Wound etiology
Wounds
Prevention strategies
Treat the cause
• Manage comorbidities
• Assess risk based on health status
Patient centred concerns
• Provide patient education
• Involve patient in care planning
Treatment strategies
Local wound care
Debridement
• Remove necrotic tissue
Infection/ inflammation control
• Rule out or treat infection
Moisture balance
• Provide a moist, interactive wound environment
Evaluation strategies
Re-evaluate
Treatment strategies
Biological agents and adjunctive therapies
CAWC Institute for Wound Management and Prevention, Level 1 Workbook: Putting Knowledge into Practice – Knowledge Learning; 2010 Canadian Association of Wound Care, Toronto Canada
www.ubuntuwoundhealing.co.za

Identify and treat the cause

- Determine adequate blood supply to heal
- Identify causes / aetiology
- Review cofactors / comorbidities
  - Systemic disease
  - Nutrition
  - Medications
- Evaluate ability to heal
  - Healable
  - Maintenance
  - Non-healable
- Treat the causes by an individualised plan

Determining the Healability of a Wound

Wound Prognosis	Treat the Cause	Blood Supply	Co-existing medical Conditions/drugs
Healable	Yes	Adequate	Not prevent healing
Maintenance	NO	Adequate	+/- prevent healing
Non-Healable	NO	Often Inadequate	May inhibit healing

Sibbald et al. 2011

ABPI	Toe pressure, mm Hg	Toe brachial Index	Ankle Doppler waveform	TCPO2, mm Hg	Diagnosis
> 0.8	> 80	> 0.6	Normal/triphasic	> 40	No relevant arterial disease
> 0.5	> 50	> 0.4	Biphasic/monophasic	30-39	Some arterial disease: Modify compression
> 0.4	> 30	> 0.2	Biphasic/monophasic	20-29	Arterial disease predominates
< 0.4	< 30	< 0.2	Monophasic	< 20	High risk for limb ischemia

Browne, Sibbald 1999

Address patient centred concerns

- Pain
- Activities of daily living
- Psychological well-being
- Smoking
- Access to care, financial limitations
- Provide education and support to person and circle of care

* Smoking decreases cutaneous blood flow by 40% and a single cigarette causes vasoconstriction for 90 minutes

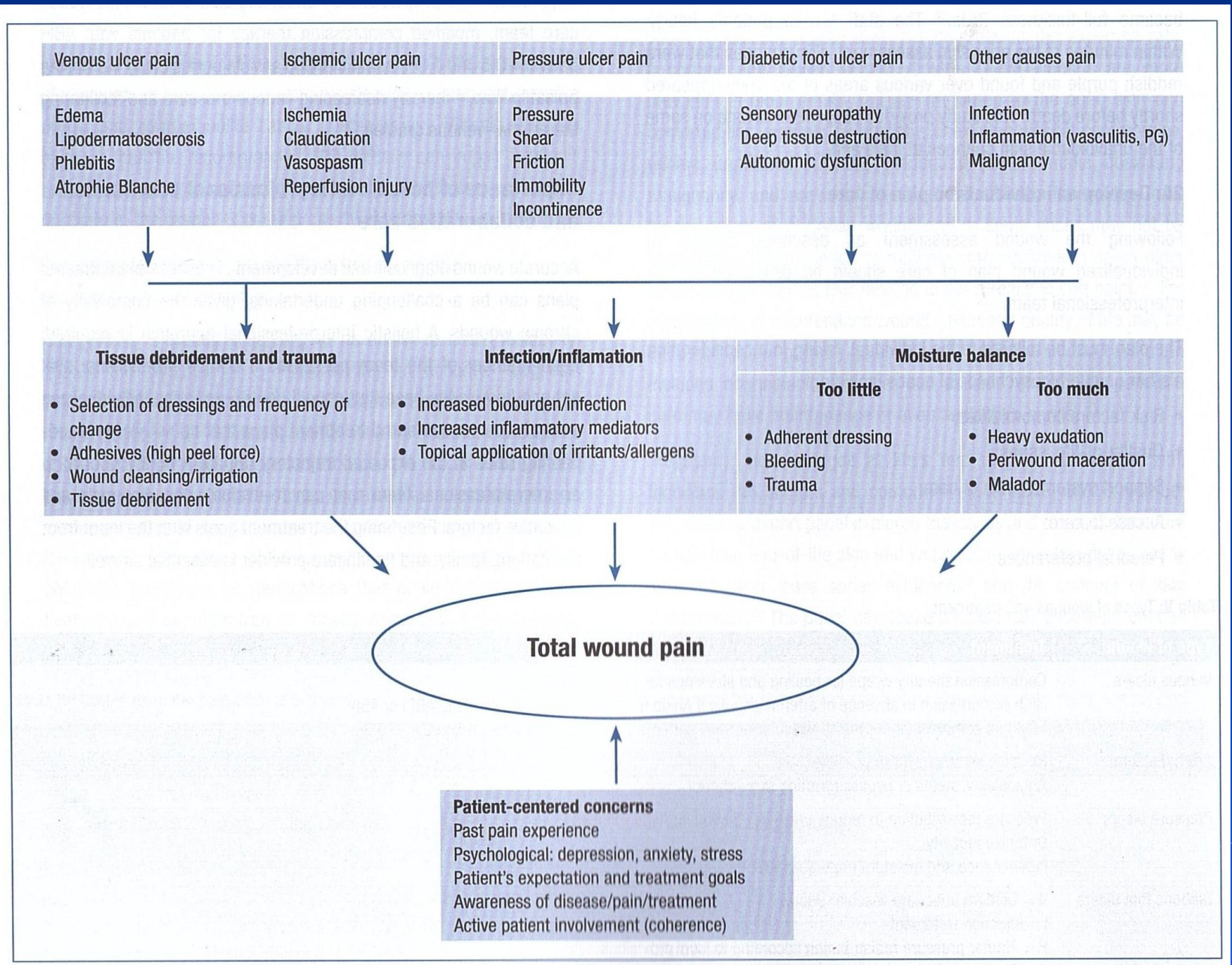
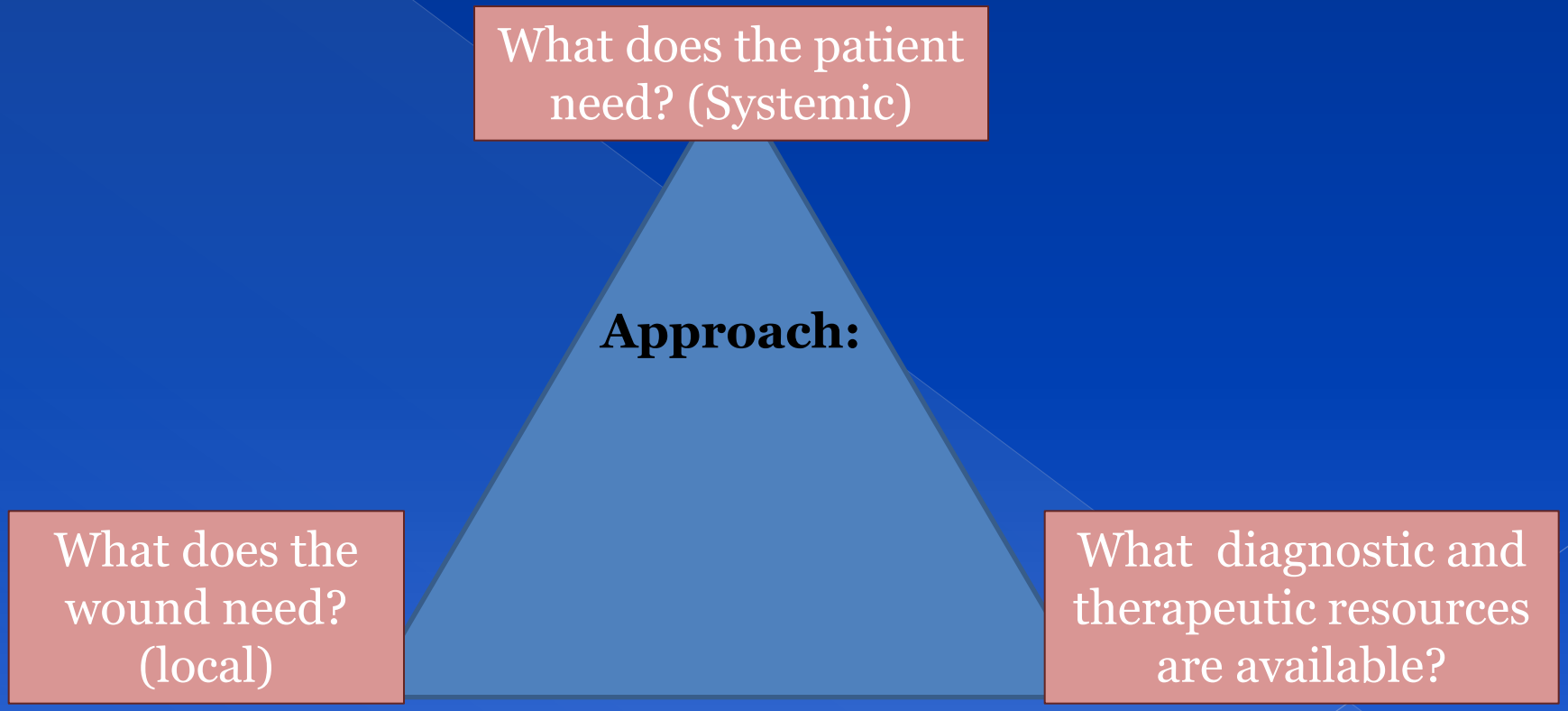


Figure 1: Wound associated pain (WAP) model: the wound, the cause, the patient

Local Wound Care I

Access and monitor wound history and physical examination



Assessment II

- History – Aetiology, diseases, demographics, treatment
- Examination – systemic diseases, perfusion, sensation
  - TIMESS – **T**issue, **I**nfection, **M**oisture, **E**dge, **S**urrounding **S**kin, **S**pecific Classification (Wagner)
  - — MEASURE — **S**ize, **E**xudate, **A**ppearance, **S**uffering, **U**ndermining, **R**e-evaluate, **E**dge
- Special investigations – radiology, biochemistry, biopsies
  - markers of nutrition (prealbumin, haemoglobin)

Local Wound Care III

Gently cleanse with low-toxicity solutions – saline, water and other

Non-Healable/Maintenance Wounds

Agent	Effects
Acetic Acid (0.5 – 5%)	Lowers pH, stings + Pseudo, super selects S aureus
Chlorhexidene (0.5%)	++ Gm- ve and +ve Low tissue toxicity Aqueous solution best for wounds
Povidone iodine (10%)	Broad spectrum Gm- and +ve, anaerobes, fungi, viruses, biofilms Activity ↓ in pus or exudate Slow release formula cause autolytic debridement
Crystal Violet-Methylene blue	Broad spectrum antimicrobial Slow release form has low tissue toxicity Can be used with enzymatic agents

Local Wound Care IV

Do not irrigate wounds without visualising depth and when aspirate is not retrievable

Harmful Agents	Effects
Dyes (scarlet red, proflavine)	Select out Gram negative organisms
Na Hypochlorite (Dakins, Eusol)	Toxic – bleach
Hydrogen Peroxide	Action – fizz
Quatemary Ammonia (Centrimide)	Very high tissue toxicity

Debridement V

Healable wounds

	Surgical	Enzymatic	Autolytic	Biologic	Mechanical
Speed	1	3	5	2	4
Tissue selectivity	3	1	4	2	4
Painful wound	5	2	1	3	4
Exudate	1	4	3	5	2
Infection	1	4	5	2	3
Cost	5	2	1	3	4
** Where 1 is the most desirable and 5 is least desirable					

Sibbald et al, 2011

Non-healable and maintenance wounds

Conservative surgical or other methods to remove nonviable slough

Infection VI

- Distinguish between contamination and colonization
- Infection = number of organisms x organism virulence
- Chronic wounds have 1.6 – 4.4 bacterial species present
- Surface swabs are unreliable
- Host resistance and adequate blood supply are most important factors
- Nature of the disease (diabetes cause deep infection e.g. osteomyelitis)

Superficial Critical Colonization VII

NERDS

- Non-healing
- Exudate ↑
- Red, fragile and bleeding
- Debris
- Smell

* Any 3 criteria treat topically

Deep Infection VIII

STONEES

- Size is bigger
- Temperature ↑
- Os (probes, exposed)
- New breakdown
- Exudate ↑
- Erythema, Edema
- Smell

* Any 3 criteria treat systemicly

Dressings IX

Healable wounds

- Autolytic debridement:
  Alginates, Hydrogels, Hydrocolloids, Acrylics
- Critical colonisation:
  Silver, Iodides, PHMB, Honey
- Persistent inflammation:
  Anti-inflammatory dressings
- Moisture balance:
  Foams, Hydrofibres, Alginates, Hydrocolloids, Films, Acrylics

Non-healable, maintenance wounds

- Chlorhexidene, Povidone-iodine

* **Select an appropriate dressing for the needs of the WOUND, the PATIENT and the CAREGIVER**

Moisture balance dressings

Dressing Class	Debridement	Infection Critical Colonization	Moisture Balance
Non-adherent	-	-	-
Films	+	-	-
Hydrogels	++	-/+	+
Hydrocolloids	+++	-/+	++
Acrylics	+	-/+	++
Calcium Alginates	++	+	++
Foams	-	-	+++
Hypertonic Saline	+	+	++
Hydrophilic Fibres	+	+	+
Antimicrobial	VAR*	+to+++	VAR*

* VAR=Variable according to dressing class listed above
+ Minimal activity, ++Moderate activity, +++Strong activity
- No Clinical activity

Sibbald, et al

Evaluation X

- Evaluate the expected rate of wound healing
- Healable wounds should be **30% smaller** by week 4 and **healed by week 12**
- Acute uncomplicated wounds should be healed in **21 days**
- Wounds not healing at the expected rate should be reassessed and reclassified and the care plan revised

Active Wound Therapies XI

- If healing does not progress (stalled wound) after other factors have been corrected,
- active wound therapies should be used
  - Skin grafts
  - Biological agents
    - Growth factors
    - "Artificial skins" (Apligraf, Dermagraf, Integra and Pelnac)
    - PRP (Platelet Rich Plasma)
  - Adjunctive therapies
    - Hyperbaric Oxygen
    - Electrical stimulation
    - Therapeutic ultrasound

Controversies 2013

Organizational Support

- Education
- Evidence – informed practice
- Inter-professional teams
- Cost effective care
- Co-operative health care systems

RECONSTRUCTIVE LADDER FOR TISSUE COVER

- Dressings
- Neg Pressure (VAC)
- Suture
  - primary closure
  - secondary closure
  - late (tersiary) closure
- Skin graft
  - split
  - full-thickness
- Tissue expansion
  - Dermatotraction
- Local flaps
  - random cutaneous
  - fascio cutaneous
  - muscle
- Regional flaps
- Distant flaps
- Specialized flaps
  - free
  - composite
  - sensory

Refer asap ← **Complicated**

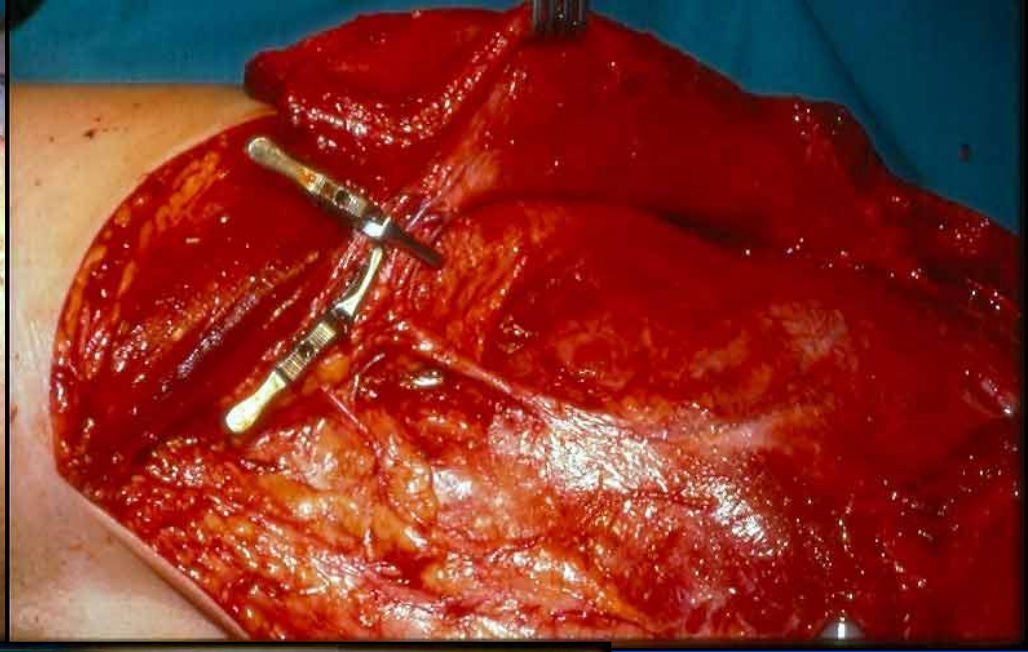
Consult experts ← **Simple**

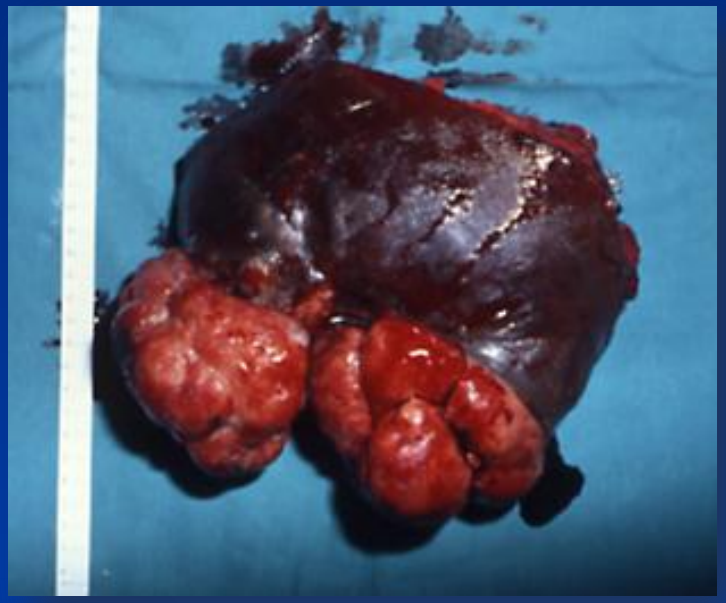
REASONS FOR SKIN GRAFT FAILURE

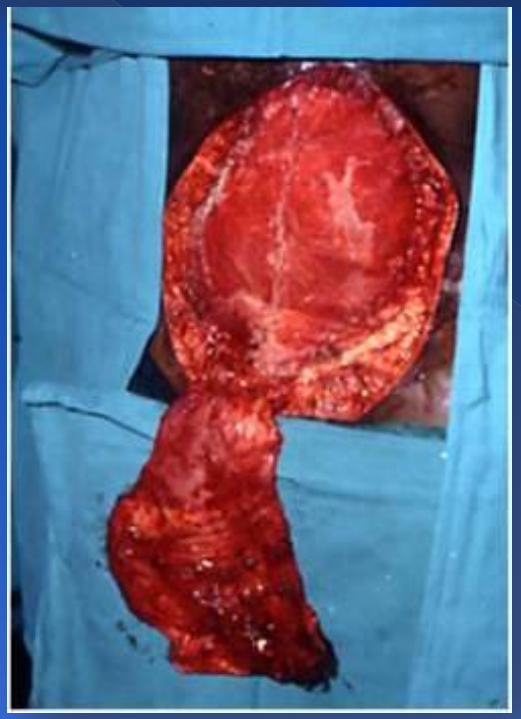
- poor quality or no bed (old granulation tissue)
- haematoma/seroma (between graft and bed)
- infection (streptococcus species)
- movement (splinting of extremeties)
- technical (thickness of graft)

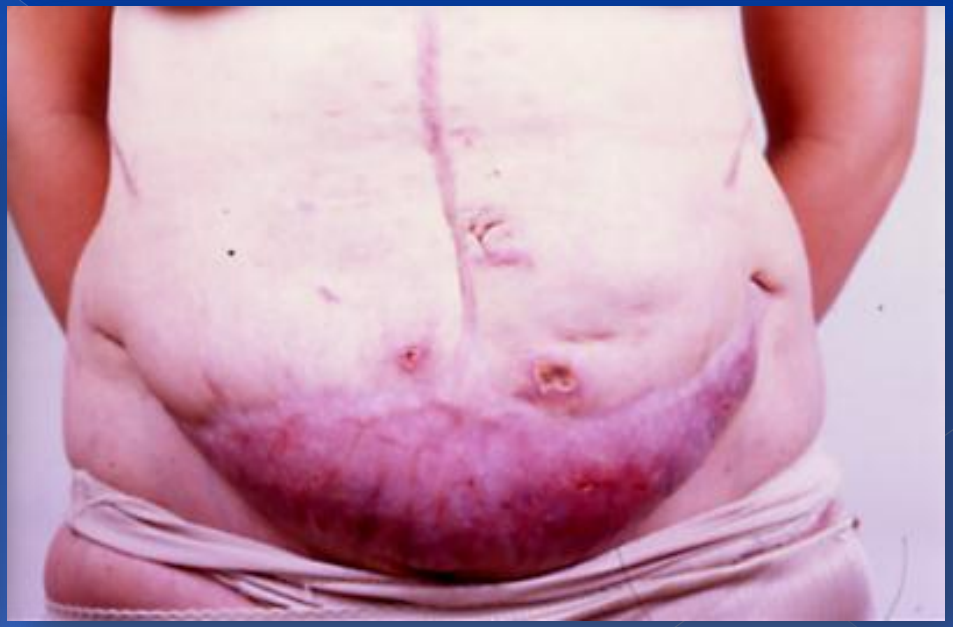
INDICATIONS FOR FLAP RECONSTRUCTION

- **Non-suitable bed**
  - **Poor vascularity**
  - **Exposed structures**
    - Bone
    - Cartilage
    - Neuro-vascular bundles
    - Tendons
  - **Exposed body cavities**
    - Thoracic
    - Dura
  - **Exposed vital organs**
    - Heart
    - Lung
    - Brain
- **Reconstruction for function**
  - Hand
  - Esophagus
  - Genitals
- **Reconstruction for sensation**
  - Sole of the foot
- **Facial features**



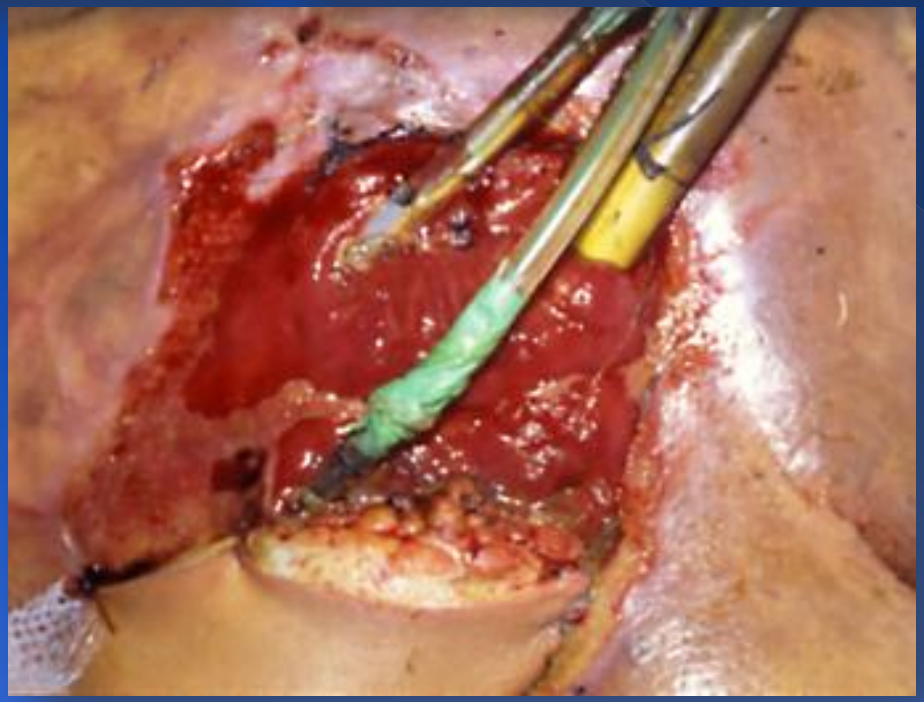








Sibbald et al. 2011




Summary

- Treat the whole patient, not the "hole" in the patient.
  Address the cause and the patient centered concerns
- Acute wounds should be healed in 3 weeks and healing chronic wounds (older than 6 weeks) by 12 weeks
- Healing moderate to large wounds by secondary intention is not best practice
- WBP prepares for a definitive surgical procedure
- NPD (VAC) used for long periods is often an abuse of funds
- The principle of wound care is simple but if not practiced scientifically will still result in delayed or non-healing

THANK YOU