

Wound Clinic & Wound Care

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January 2020

Objectives

- Understand the structure and function of the wound clinic
- Basic concepts of wound healing and wound management
- Indications for referral to wound clinic

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Key Statistics

- 1% of the population will develop chronic wound
- 6.5 million Americans
- 2%-4% of all healthcare spending
- Hundreds of product available
- >1000 outpatient WCC; Cost: \$50B on wound care service

Definition of Wound Care

Medicare defines wound care as:

“care of wounds that are refractory to healing or have complicated healing cycles either because of the nature of the wound itself or because of complicating metabolic and/or physiological factors.

Goals of WCC

To heal wounds as quickly as possible using the most evidence-based and cost-effective treatments.

Wound Care Clinic Advantage

“consistent delivery of efficient, organized, and evidence-based patient care” (Gottrup, Nix & Bryant, 2007, p. 37).

“as a sole practitioner it’s difficult to address all complications” and “ if the patient benefits from the multidisciplinary approach available in the wound clinic setting, so does the practitioner” Smith (2006) describes the experiences of one

physician in the US that embraced the multidisciplinary wound care approach in his practice. Dr. DeFrancis stated

Wound Care Centers (WCC)

- They are managed by qualified health care professionals

Wound Care Team

Wound care Nurse Practitioner/ Certified Wound, Ostomy and Continence Nurse, general surgeon and a plastic surgeon.

Other specialties are consulted on a need basis. (Family medicine, podiatry, vascular surgery, orthopedic surgery, neurosurgery, physical medicine; etc.)

Wound care teams vary in their membership from facility to facility.

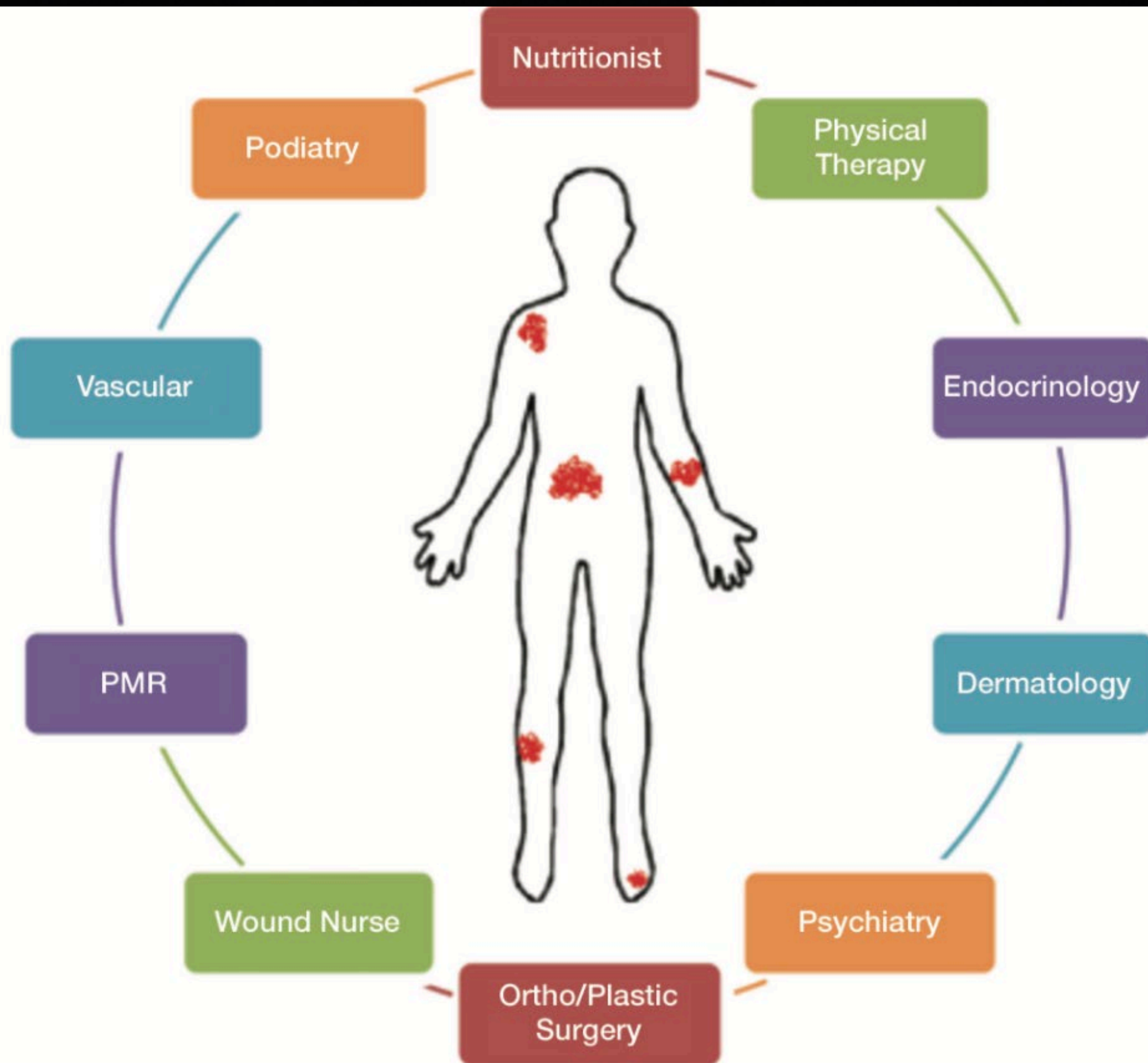


Figure 2. Range of Specialties Complex Wound Patients May Require for Treatment
PMR indicates physical medicine and rehabilitation; Ortho indicates orthopedic.



Challenges to Wound Care Centers (WCC)

- Documentation
- Dressing and Therapy options in WCC
- Delayed patient referral to WCC
- Levels of wound care specialization
- Patient compliance
- Caregiver limitations

Challenges to Wound Care Centers

Reimbursement policies

- Stringent, complex reimbursement policies based on quality of care and clinical outcome results. (value based payment)
- In 2020; wound care professionals will be reimbursed based on achieving the highest quality outcomes at the lowest total cost of care with high levels of patient satisfaction.
- Quality measures (QMs) reporting will determine the hospital and physician revenue

Dressings

“Simple”

- Moist environment.
- Gauze
- Low- Adherent Dressings
- Films (Opsite, Tegaderm); Hydrogels (Intrasite)
- Hydrocolloid Dressings (DuoDERM, AQUACEL)
- Foam Dressings (Mepilex)
- Dry Environment
- Alginate Dressings (Kaltostat)
- Antimicrobial
- Silver impregnated Dressings

Challenges to Wound Care Centers

Dressing “Advanced”

Type of Advanced Wound Care Therapy	Product Name
Culture-derived human skin equivalent	Apligraf (Organogenesis, Canton, MA) Epitel (Vericel Corp, Cambridge, MA)
Human fibroblast-derived dermal substitute	Dermagraft (Organogenesis, Canton, MA) OrCel Bilayered Cellular Matrix (Ortec International Inc, New York, NY)
Porcine small intestinal submucosa extracellular matrix	OASIS Matrix (Smith & Nephew, Hull, UK)
Amniotic membrane allograft	EpiFix Human Amnion/Chorion Membrane (MiMedx, Marietta, GA) AmnioBand Allograft Placental Matrix Membrane, (MTF Wound Care, Edison, NJ) GRAFIX Cryopreserved Placental Membrane (Osiris Therapeutics, Inc, Columbia, MD)
Acellular dermal scaffolds	GRAFTJACKET Regenerative Tissue Matrix (Wright Medical Technology, Inc, Memphis, TN; KCI, an ACCELITY Company, San Antonio, TX, is licensed to market this product) PriMatrix Dermal Repair Scaffold (Integra LifeSciences, Waltham, MA) AlloMend Acellular Dermal Matrix (AlloSource, Centennial, CO)
Electrical stimulation	LifeWave (LifeWave Ltd, Petach Tiqwa, Israel)[bioelectrical signal therapy] Accel-Heal, a Synapse electroceutical technology (Synapse Electroceutical Ltd, Westerham, UK) [low-intensity pulsed current] Winner EVO Stim (Richmar, Chattanooga, TN) [Tru Stim Electrotherapy]
Systemic hyperbaric oxygen therapy	Sigma Hyperbaric Oxygen Therapy Chambers (Perry Baromedical, Riviera Beach, FL) H Model Pneumatic Hyperbaric Oxygen Chambers and E Model Electronic Hyperbaric Oxygen Chamber (Sechrist Industries, Inc, Anaheim, CA)
Negative pressure wound therapy	V.A.C. Therapy, ActiV.A.C. Therapy (KCI, an ACCELITY Company, San Antonio, TX) RENASYS, RENASYS GO (Smith & Nephew, Hull, UK)

Wound VAC

- Drain Seroma/ blood
- Reduce swelling
- Increase blood flow and granulation tissue.
- Improve graft take.
- Changed every 2-4 days.



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Healing process

- 3 phases
 - Inflammation
 - Proliferation
 - Remodeling

Chronic wounds

- There is an increase in:
 - Elastase and Neutrophile derived matrix metalloproteinases leading to direct tissue damage.
 - Vital growth factors are destroyed.
 - Persistent neutrophile infiltration, dysfunctional macrophages.

Wound Types

- Surgical wounds 21%
- Traumatic wounds 19%
- Pressure ulcers 16%
- Diabetic foot ulcer 14%
- Chronic ulcer 12%
- Venous ulcer 8%
- Flaps or graft 7%
- Amputation 2%
- Arterial ulcer 1%



Conditions affecting wound healing

General factors

Nutrition

Cardiopulmonary disease

Medical treatment (chemotherapy, immunosuppression, Steroids)

Diabetes (tight control reduces infection and complications)

Smoking (Nicotine affects O₂ tension, microvascular thrombi & ischemia)

Autoimmune disease

Conditions affecting wound healing

Local factors

Peripheral vascular disease & Venous stasis (High pressure venous column, edema , scarring and ulceration)

Peripheral neuropathy (diabetes)

Radiation therapy (fibroblasts).

Pressure

Deformities

Infection, radiation, foreign body

Edema

Malignancy

Considerations for special patient population

- *Aged patient*
- (DM, PVD, mobility) Skin changes(less water content, tensile strength, subcutaneous tissue)
- Multiple medications that can affect wound healing.

Considerations for special patient population

- *Immunosuppressed patients*
- Organ transplant.
- Inflammatory bowel disease.

Direct Local Wound Care

- Three things must be addressed:
 - Bacterial imbalance
 - Necrotic burden
 - Excess wound exudate





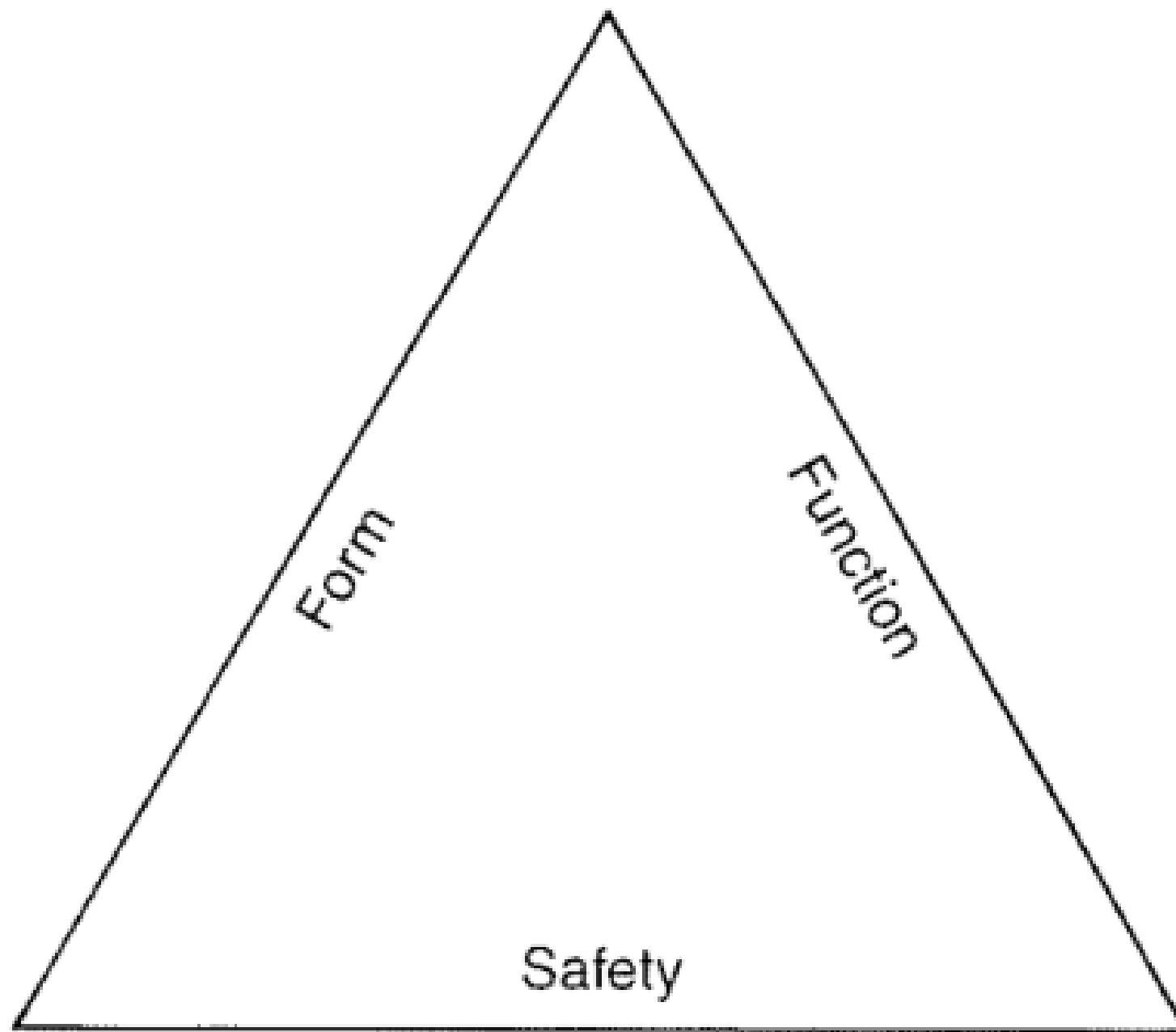
Debridement

- The mainstay of dealing with any chronic wound.
- Removes devitalized tissue.
- The aim is convert a chronic wound to an Acute one.
- Sharp debridement is the gold standard followed by thorough irrigation (pulse lavage).
- Enzymatic debridement (Santyl, Accuzyme, Elase)



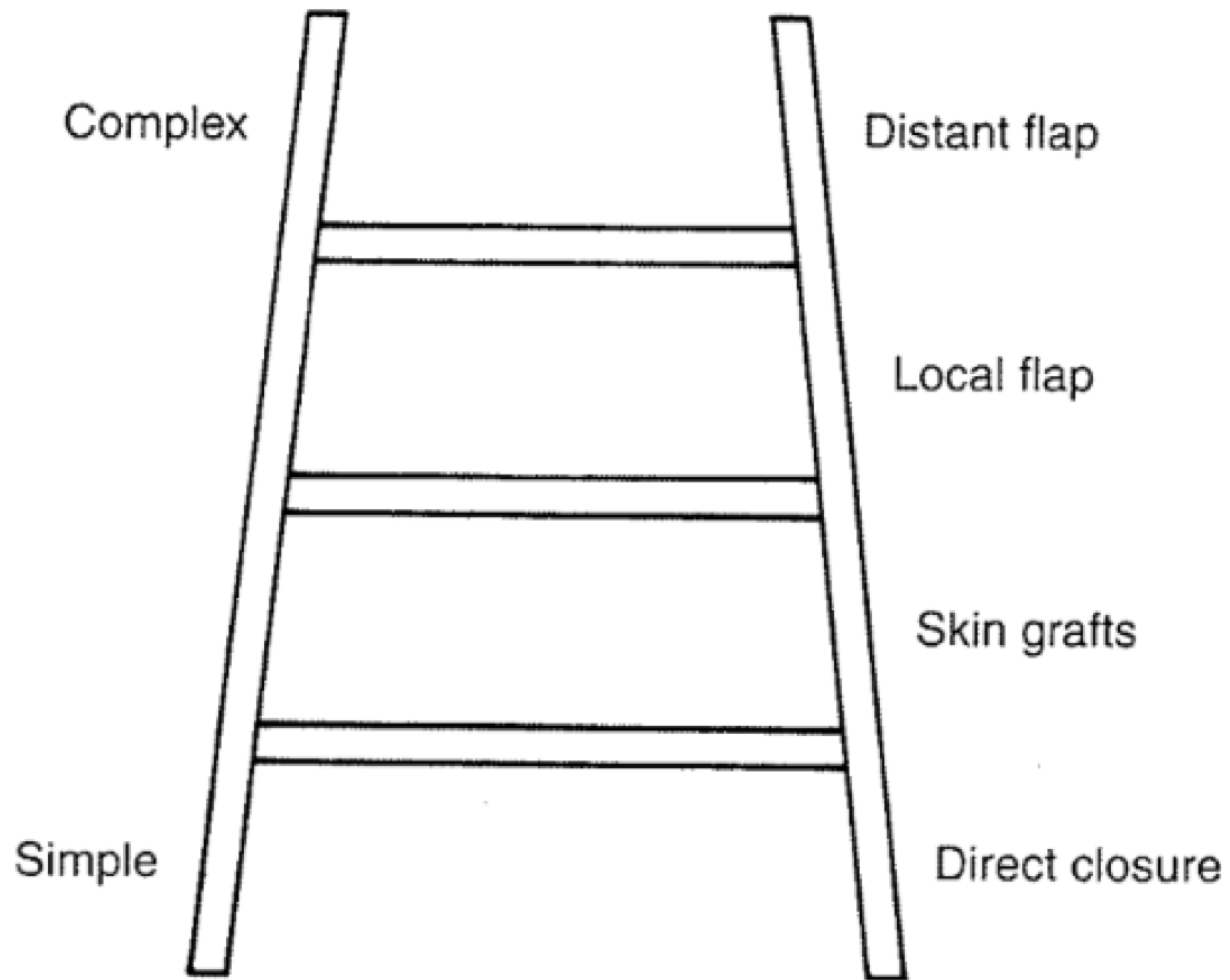


Wound Reconstruction



Reconstructive Goals

RECONSTRUCTIVE LADDER



Skin Graft

- Soil: Graft bed
- Seed: skin graft
- Sowing: graft technique
- Support: Wound VAC



Traumatic wounds

- Can be closed within 24 hours.
- Debridement and irrigation is essential.
- Primary closure, local flap, skin graft and free flaps.
- Tetanus
- Special consideration: Heavily contaminated wounds and animal bites.

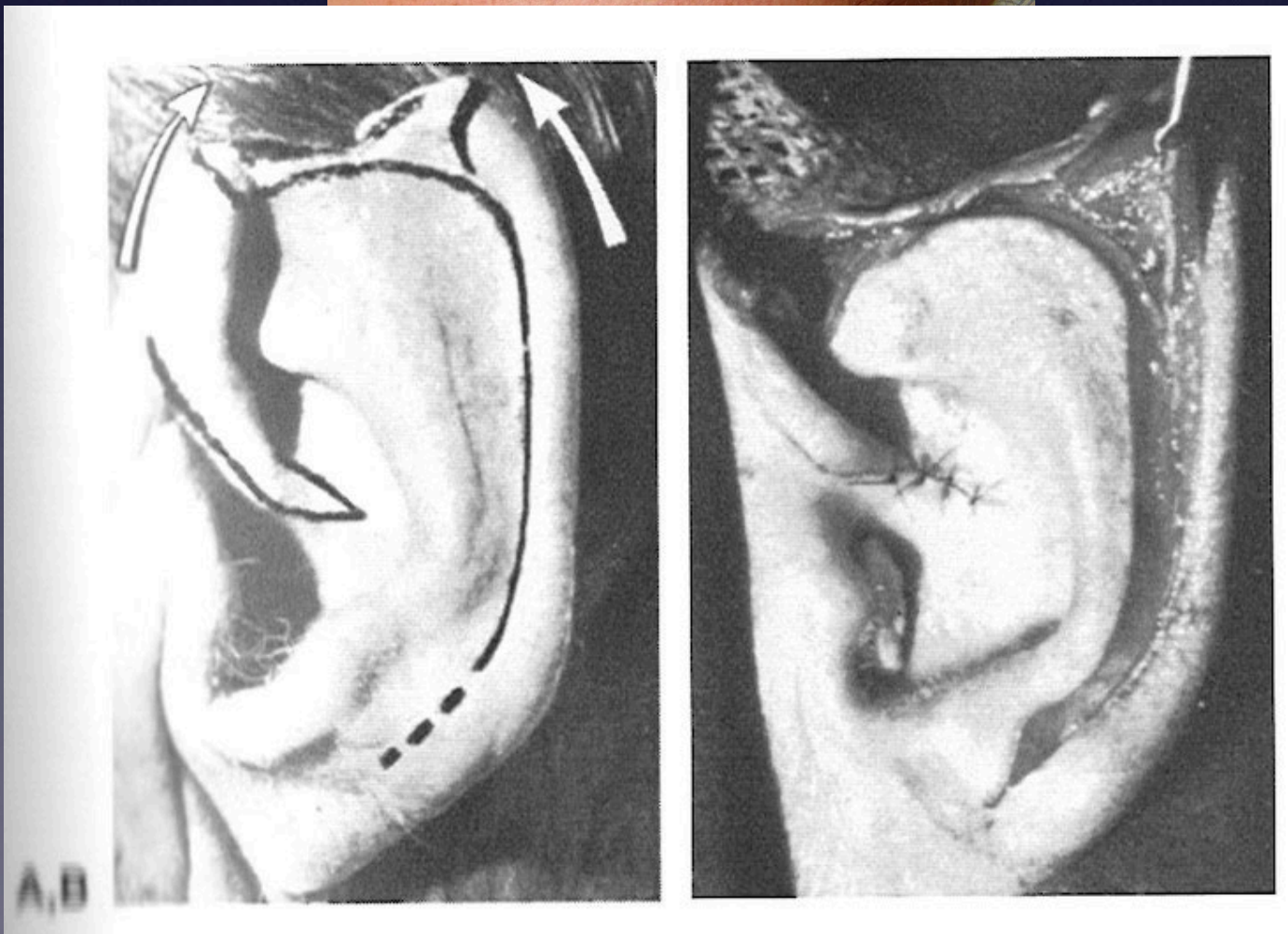






Table saw injury



Subcutaneous hematoma





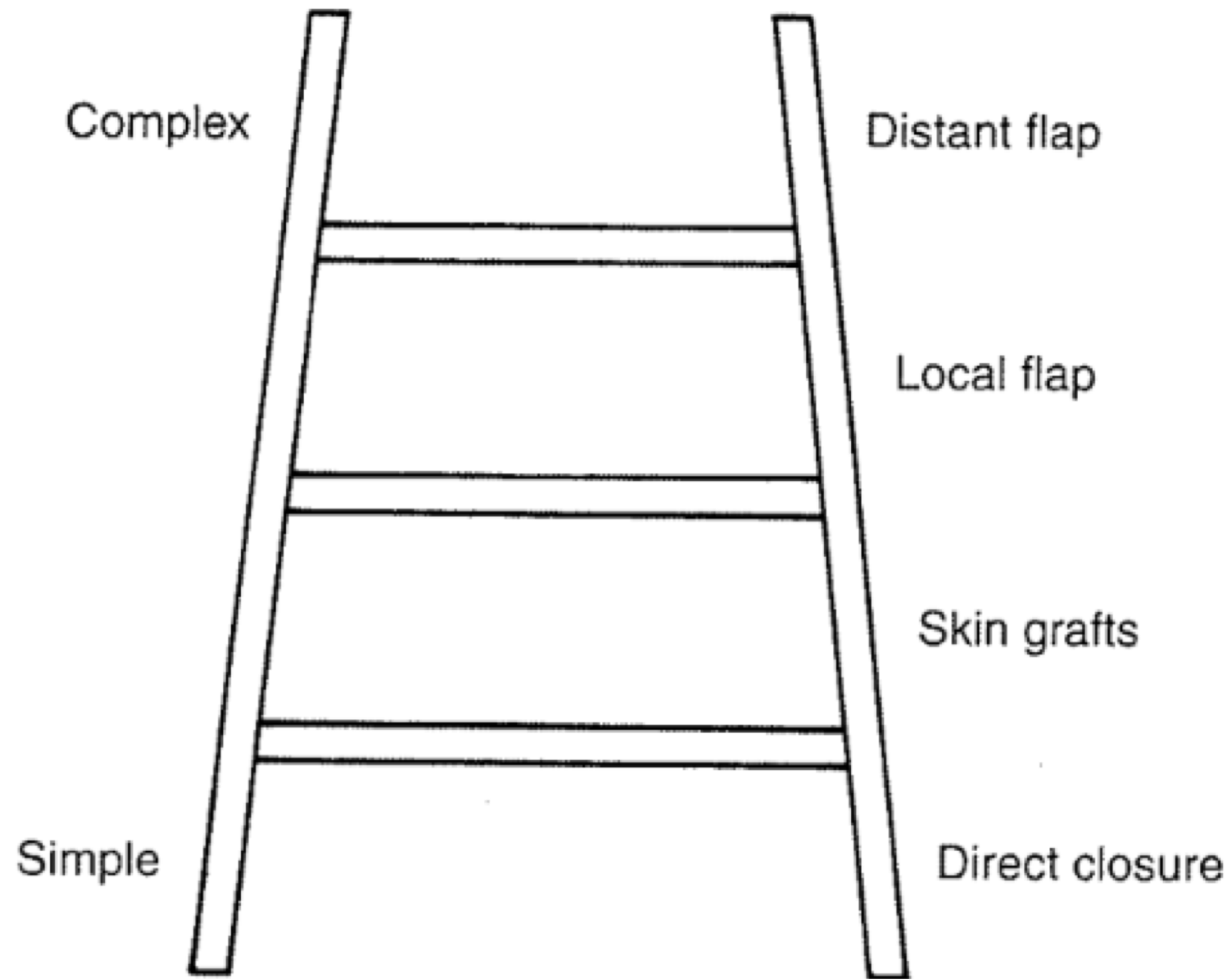
Lower extremity open fractures

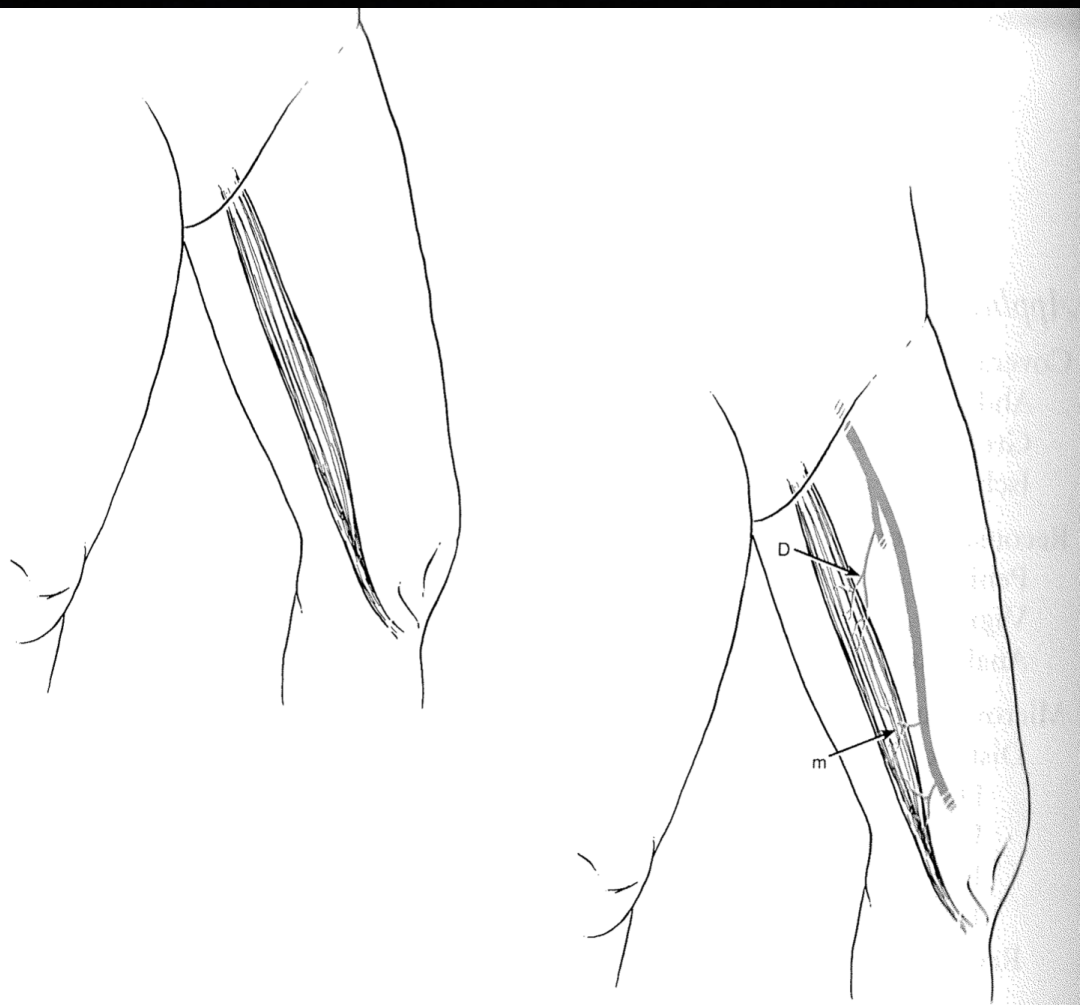
Gasrocnemius Flap
Tibialis anterior flap
Split thickness Slin graft



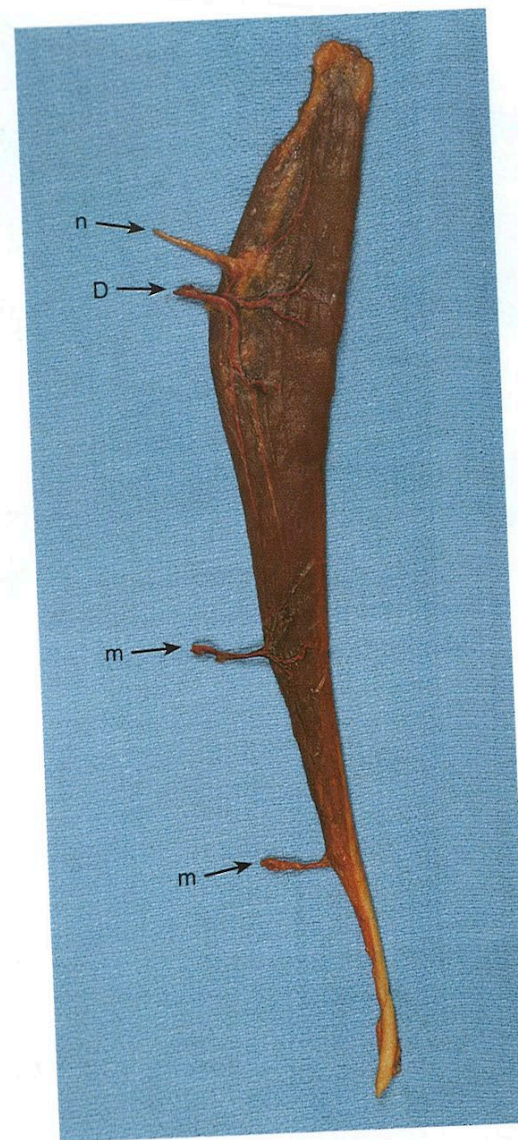


RECONSTRUCTIVE LADDER

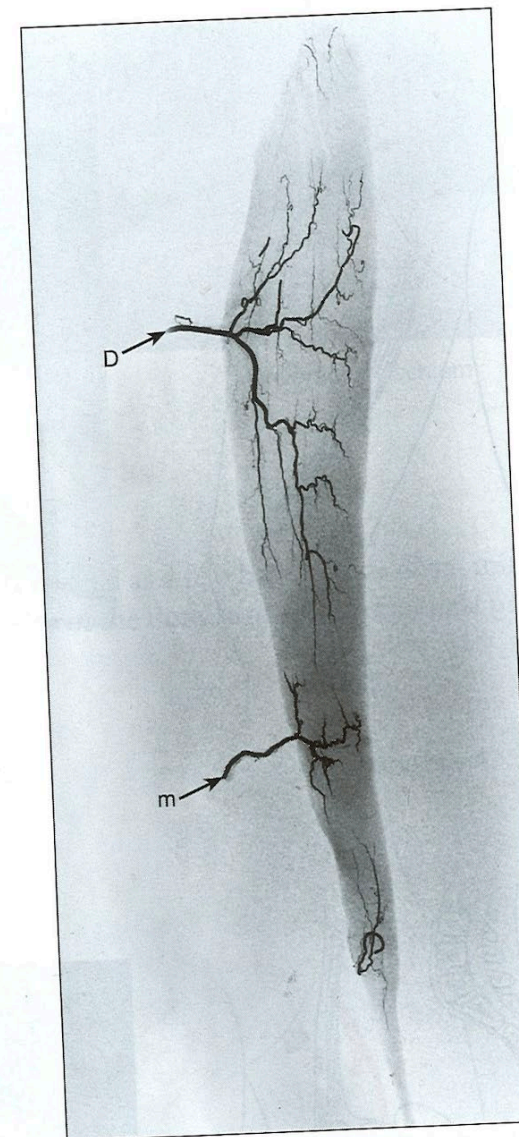




Dominant pedicle: Ascending branch of medial circumflex femoral artery (*D*)
 Minor pedicle: One or two branches of superficial femoral artery (*m*)



Deep surface of flap



Radiographic view

Gracilis Muscle Flap

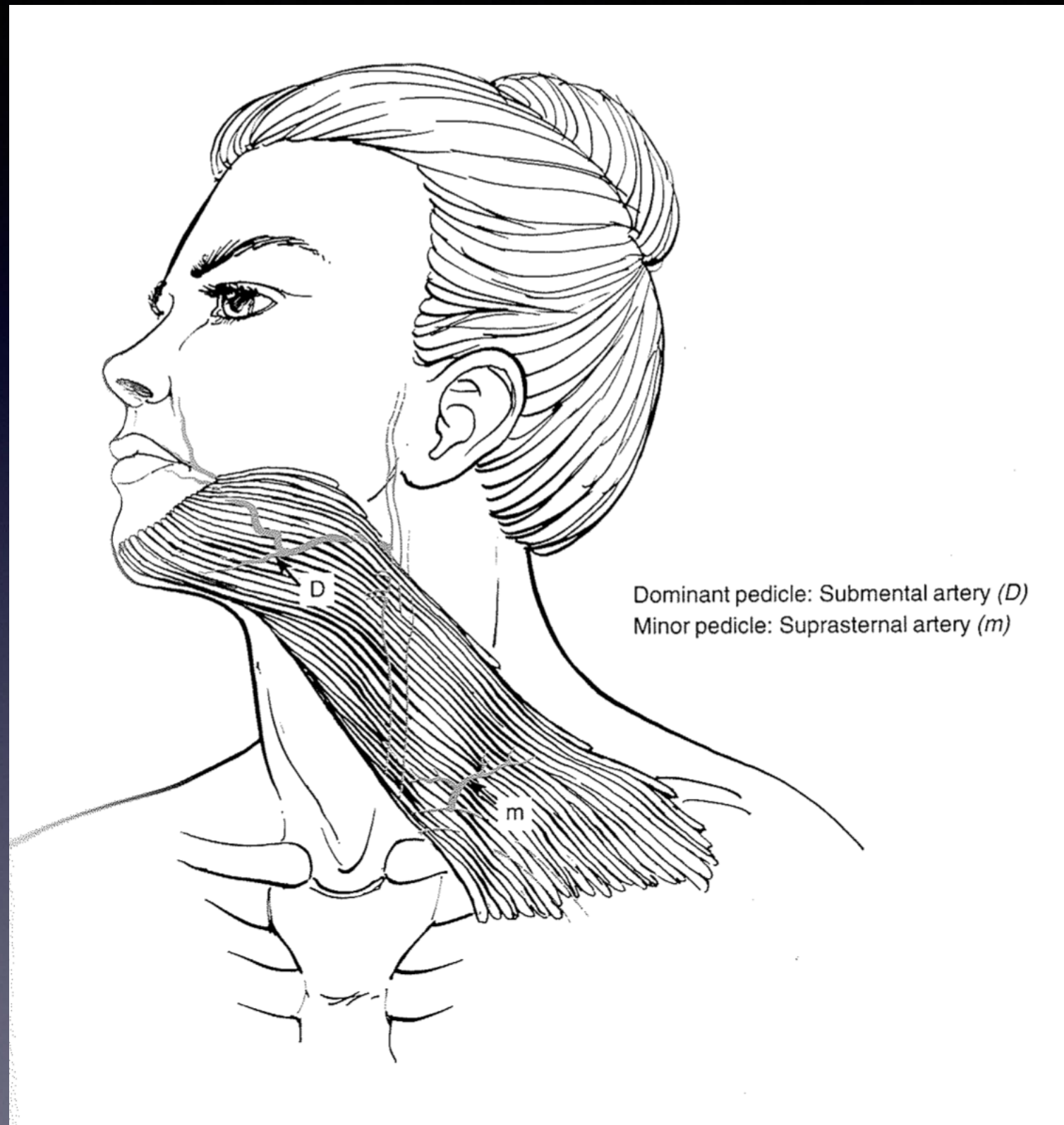


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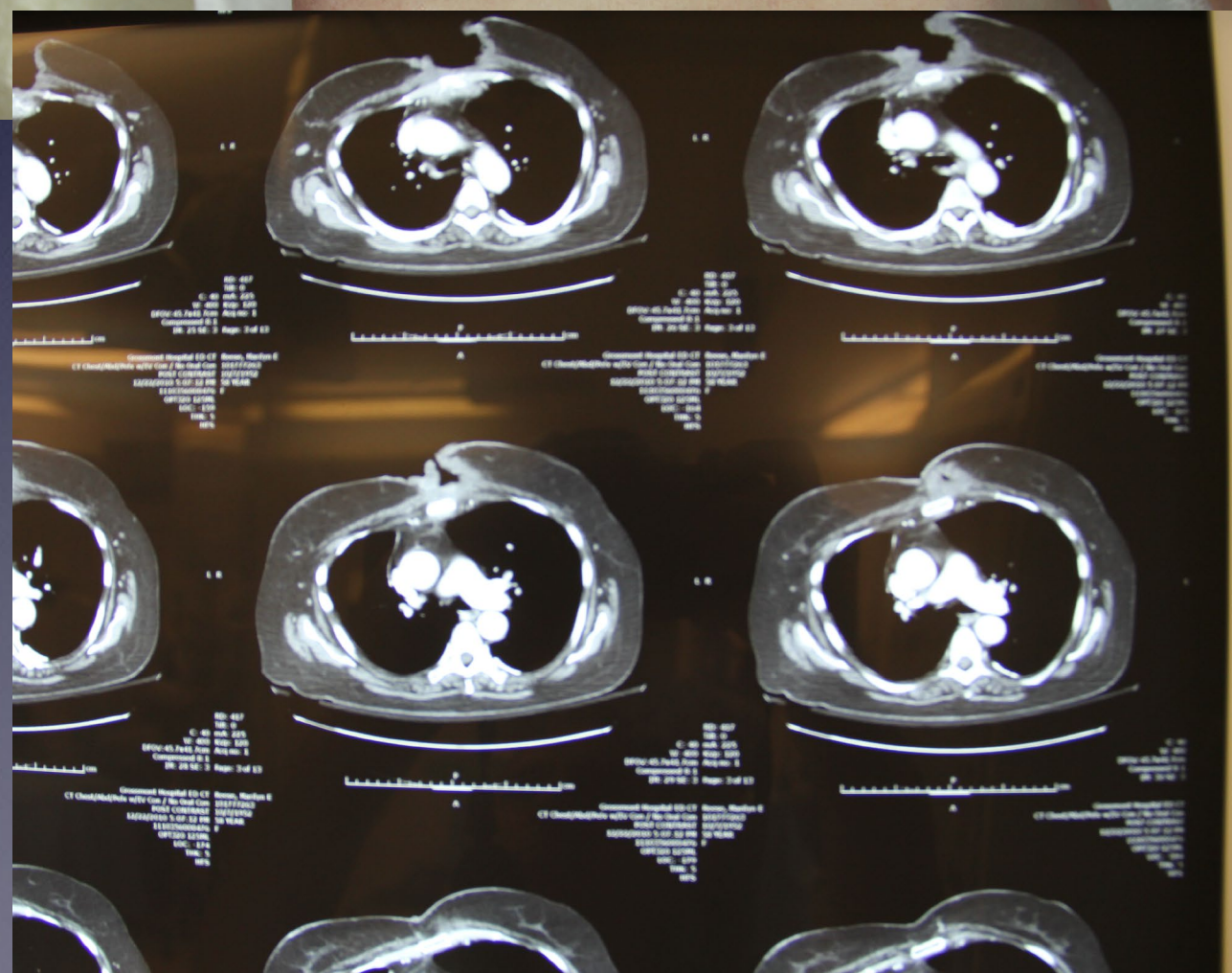
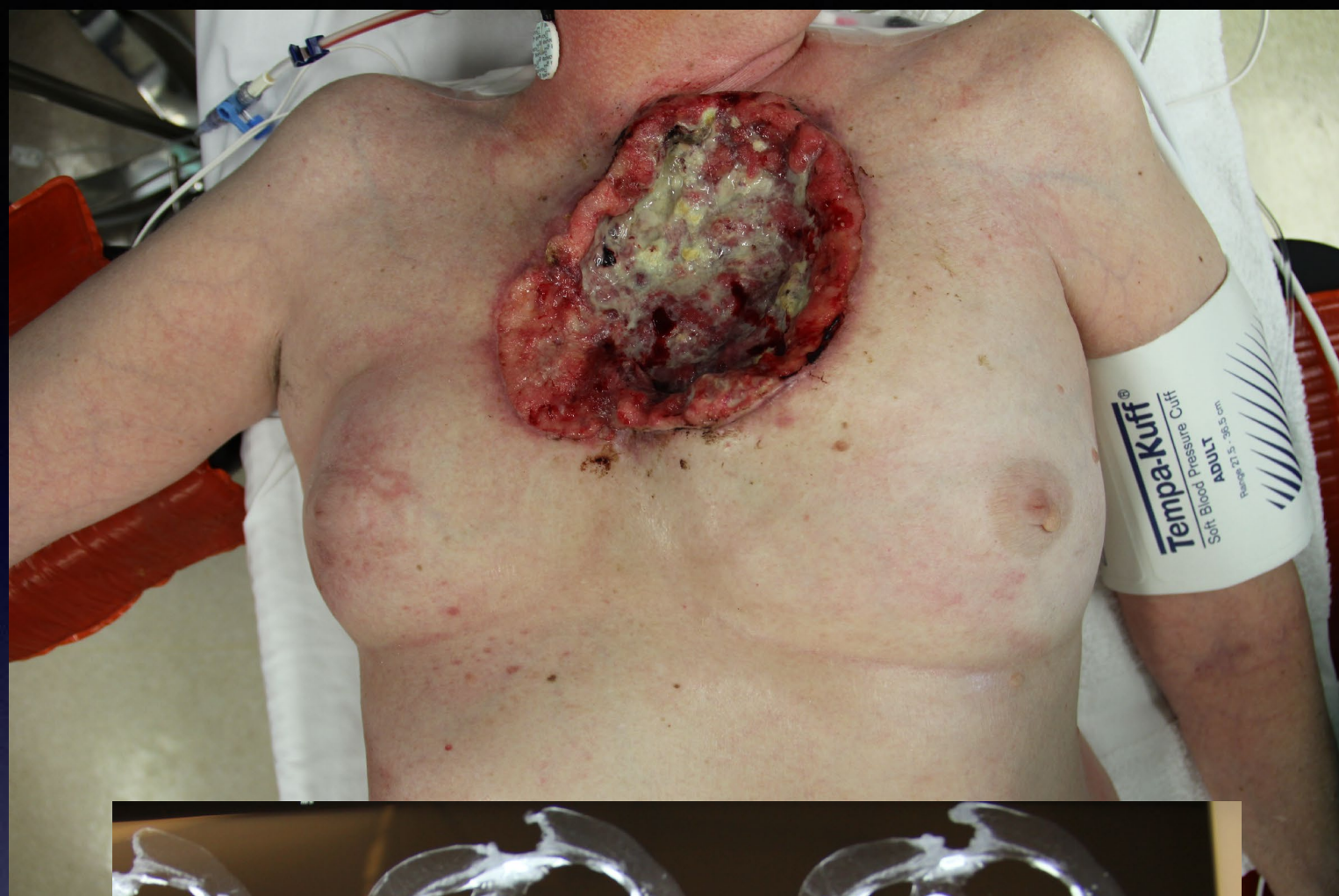
Malignant Ulcers

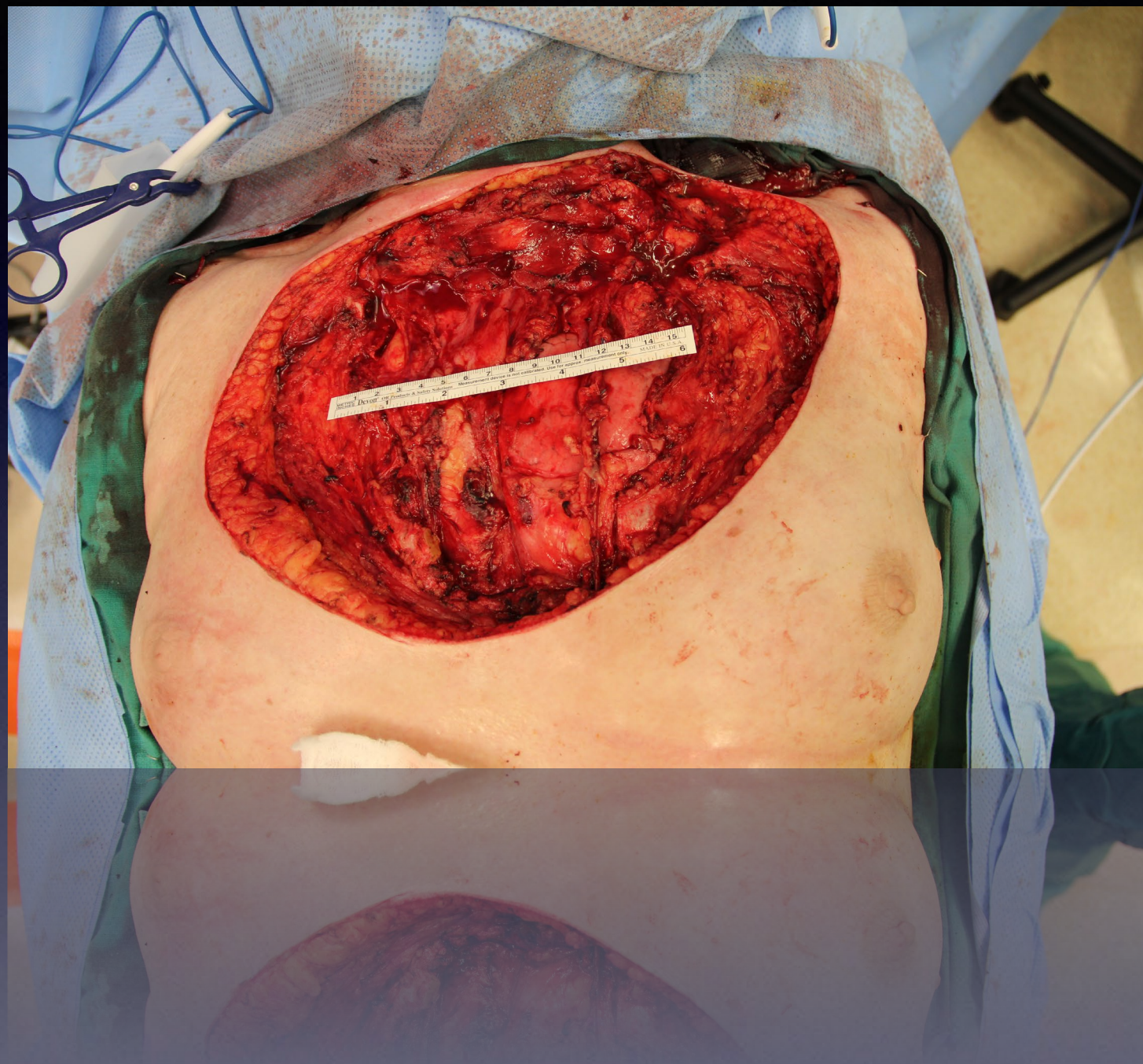
- Surgery is usually the main treatment
- Medical and Radiation oncology
- Negative margins
- Reconstruction options

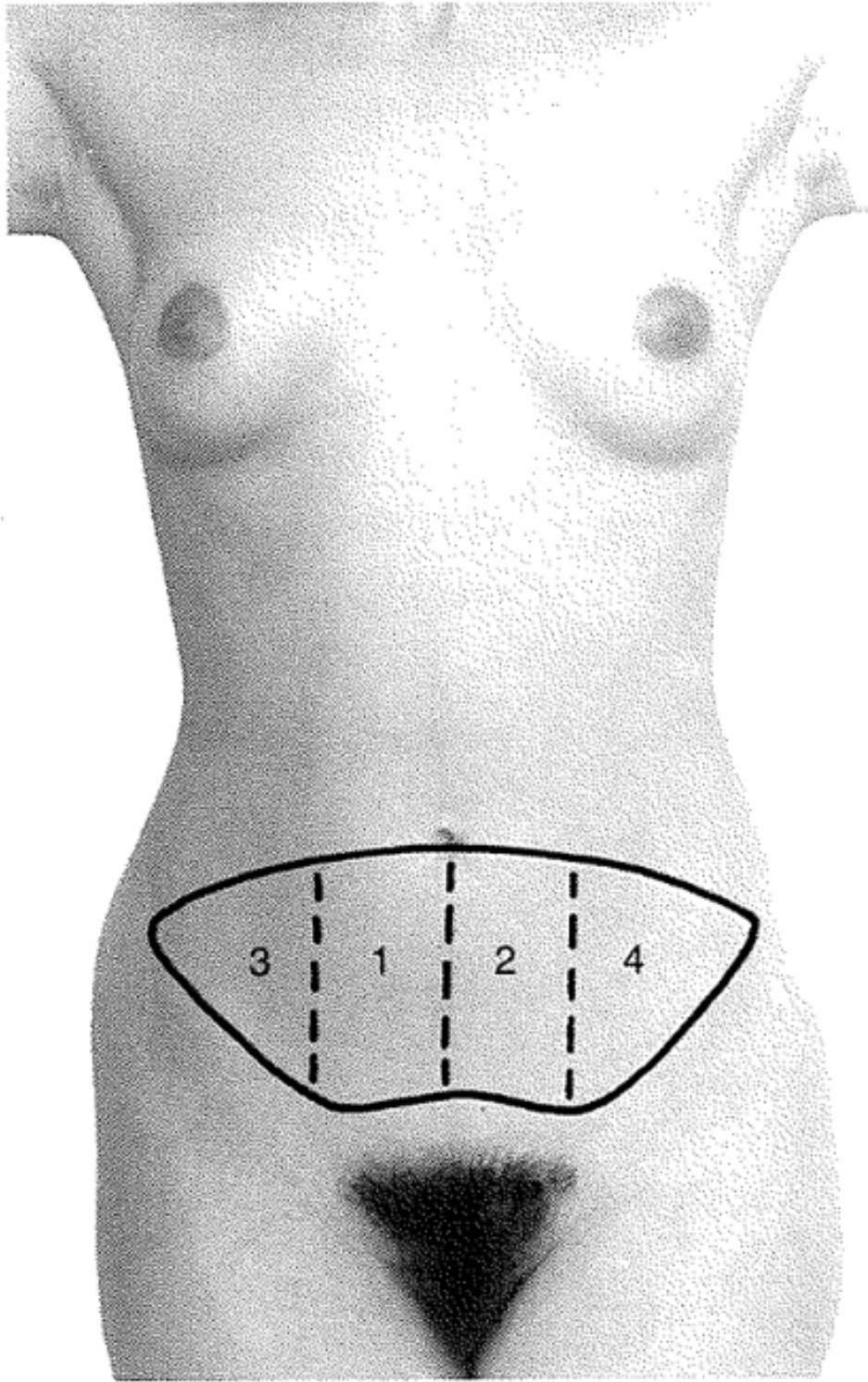




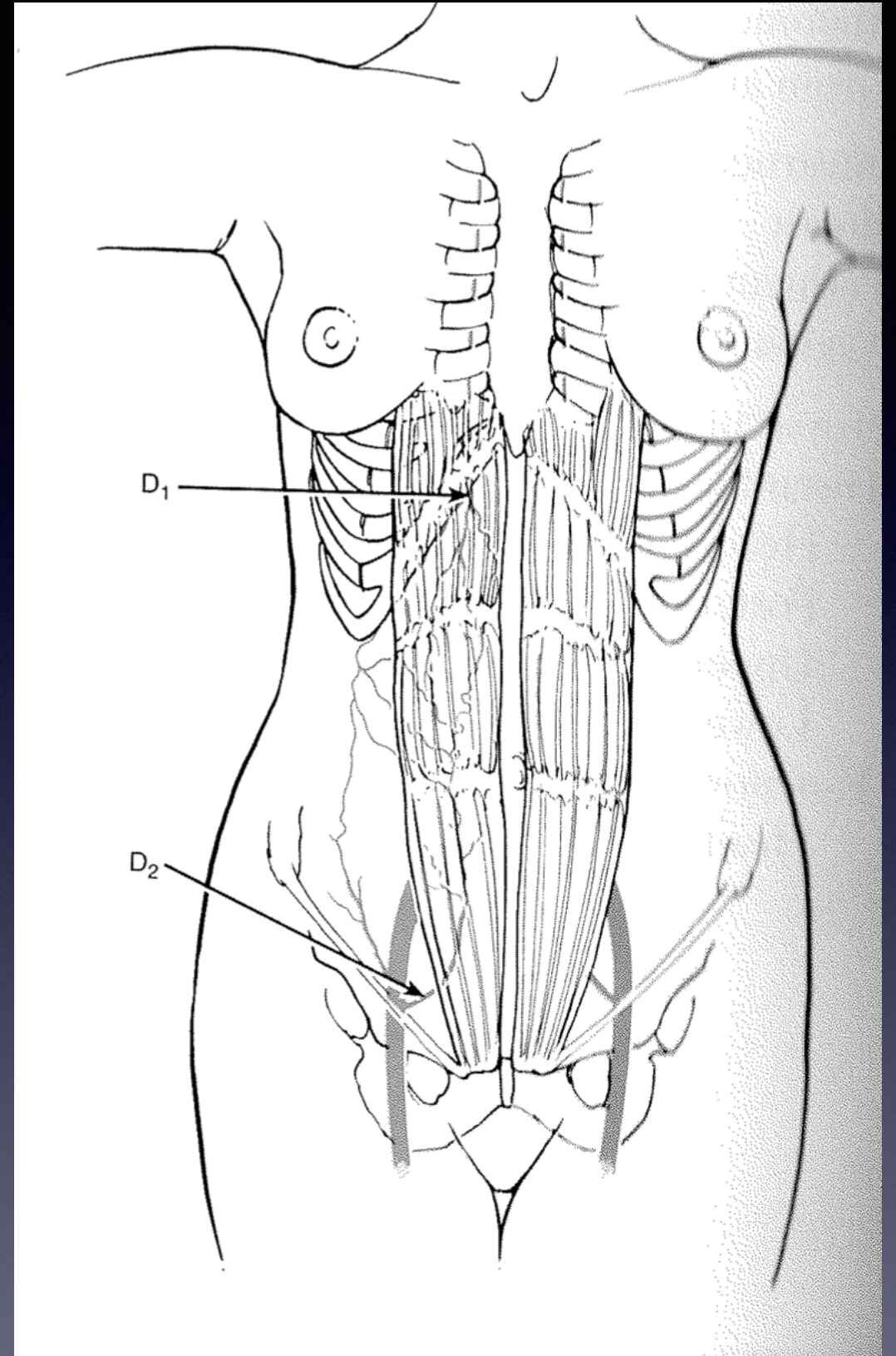


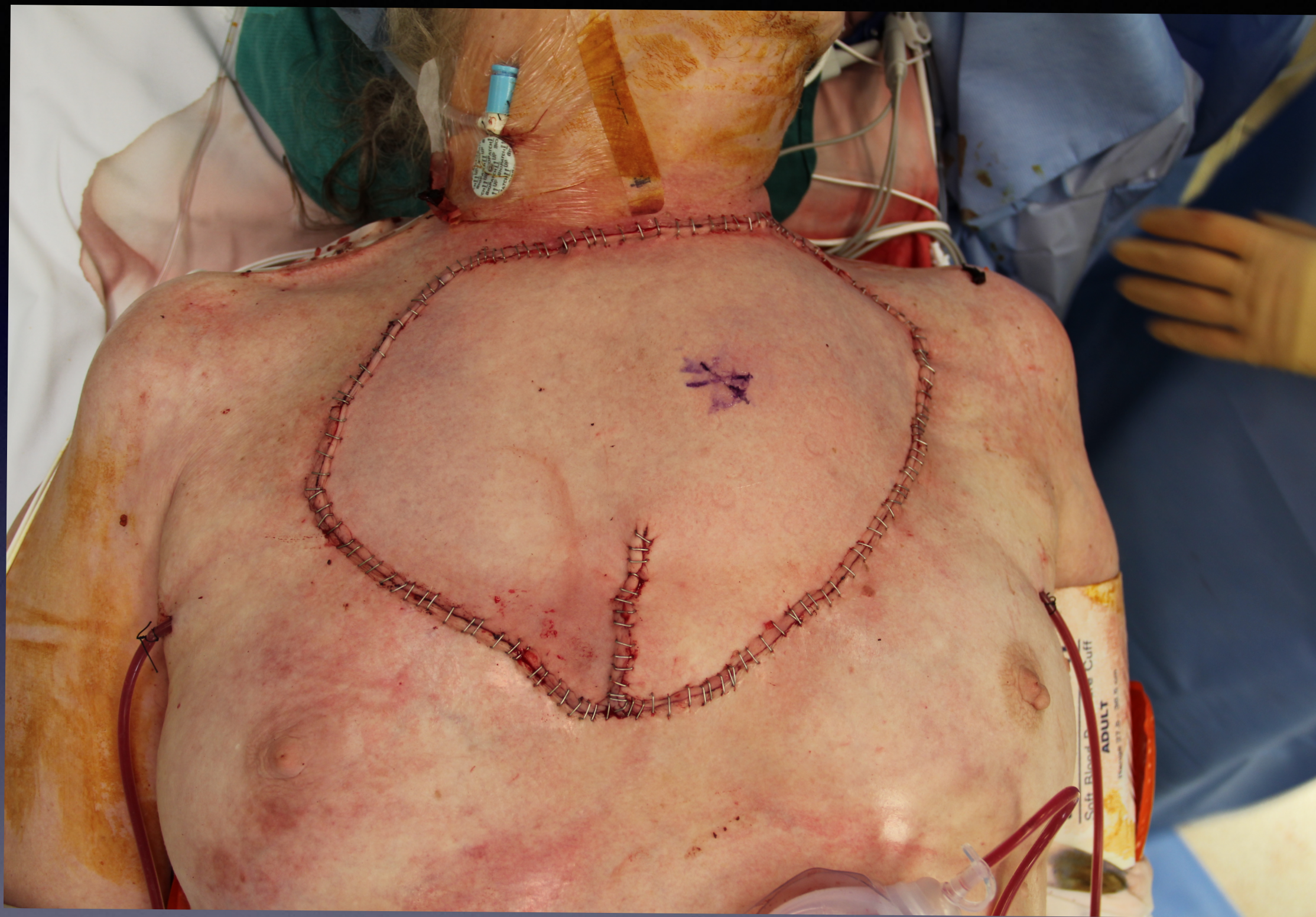






Transverse inferior skin island design
(extended skin island)





Diabetic / Vascular ulcers

- Most common wounds in wound clinic
- Most difficult to heal
- Multiple medical problems including heart, renal, neurologic
- Poor compliance
- Peripheral neuropathy and infection are major issues

Diabetic / Vascular ulcers

- Good diabetic control/ Weight loss is essential
- Lab studies: Duplex arterial and venous studies, A1c,
- Cardiac studies
- Angioplasty/ stents to lower extremity arteries
- Venous ablation, ligation, removal may be required
- CT scan/MRI to rule out osteomyelitis
- Conservative treatment Vs surgical reconstruction
- Amputation







APR 4 2007



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Pressure ulcers

- 4 stages
- Stage 1 & 2 conservative treatment
- Stage 3 & 4 usually require surgery
- Colostomy and urinary control/diversion
- Proper mattress and cushions
- Compliance, support network





Necrotizing Fasciitis

- Extensive debridement usually by general surgery
- ICU, ventilatory and circulatory support
- Antibiotic management
- Reconstruction when the wound is ready for closure







Complication of chronic wounds

- Recurrent infection
- Extensive scarring
- Osteomyelitis
- Amputation
- Malignancy (marjolin's ulcers)
- Lost work, persistent pain, cost

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Wound Clinic Referral

- Wound that show no sign of healing after 3-6 weeks of adequate treatment
- Complex wound: Bone, tendon, muscle, nerve
- Diabetic and vascular wounds
- Wounds of unknown cause



Wound Clinic phone number

619 522 3724

Thank you