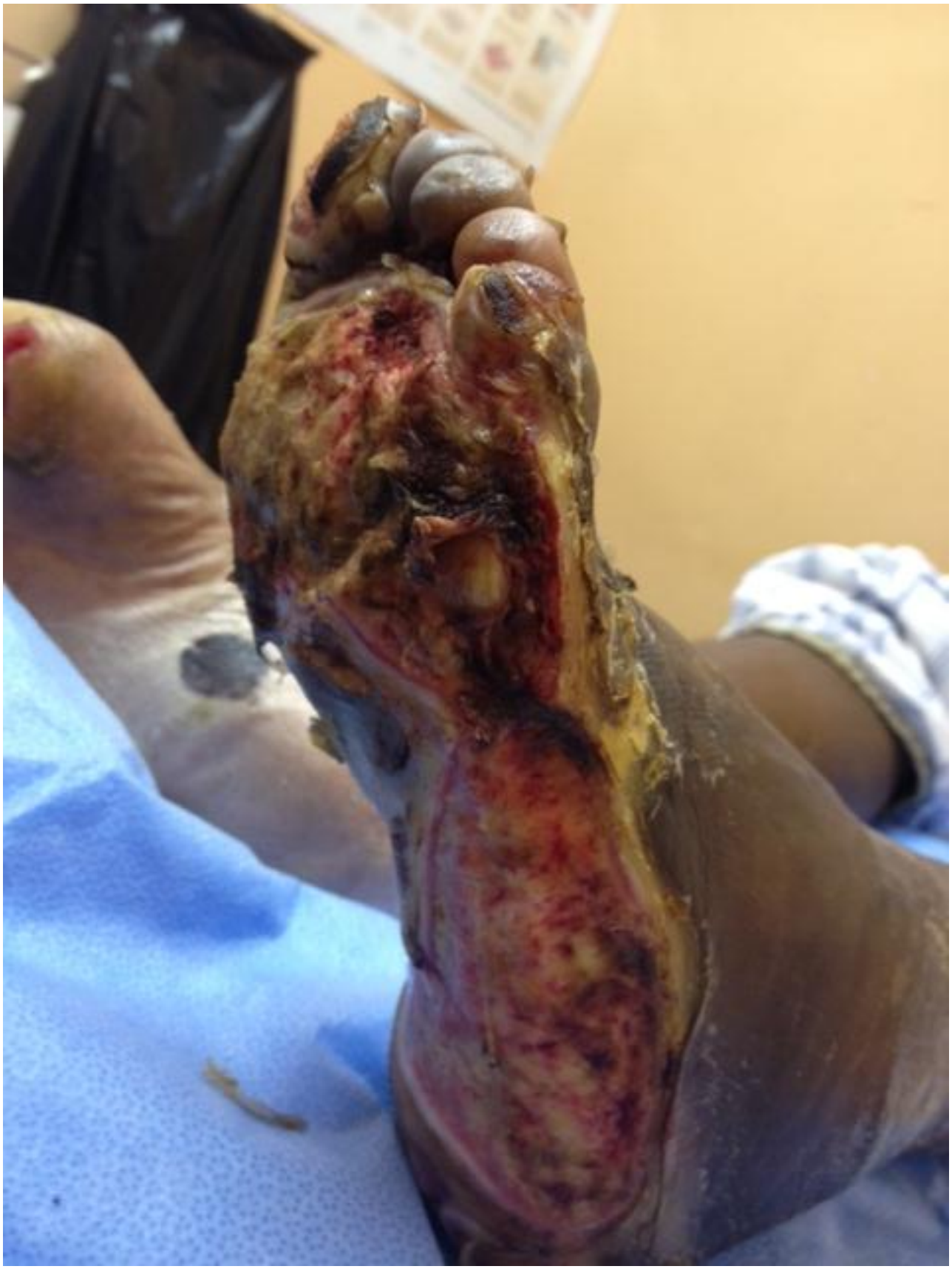
DIABETIC FOOT SEPSIS

DR LYNNE TUDHOPE



NUMBER OF PEOPLE WITH DIABETES GLOBALLY

2000	**171 million**
2030	**366 million**

International Diabetes Federation. *IDF Diabetes Atlas, 5th edn.* Brussels, Belgium: International Diabetes Federation, 2011.

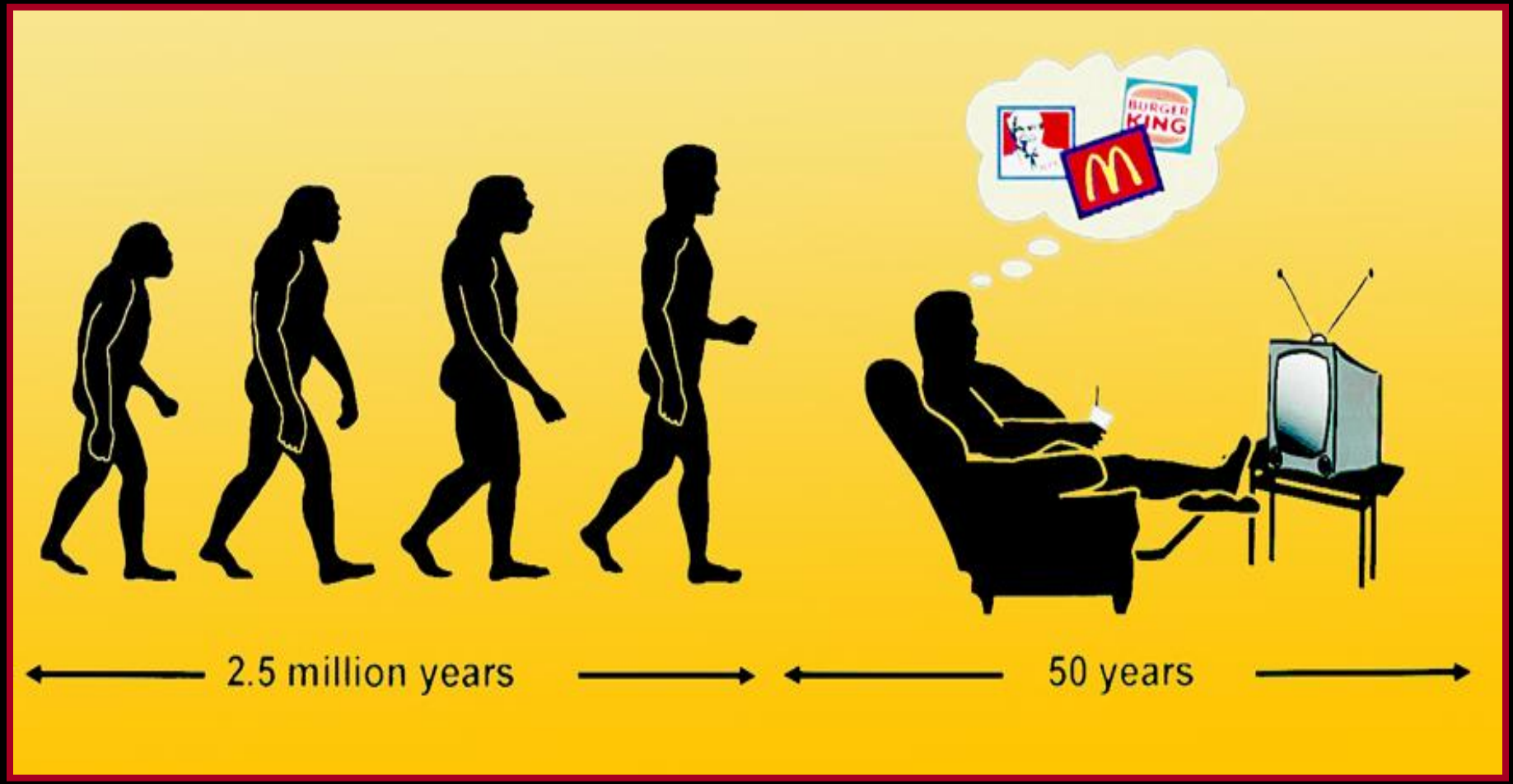
NUMBER OF PEOPLE WITH DIABETES GLOBALLY

2000	171 million
2010	285 million
2011	366 million
2030	366 million

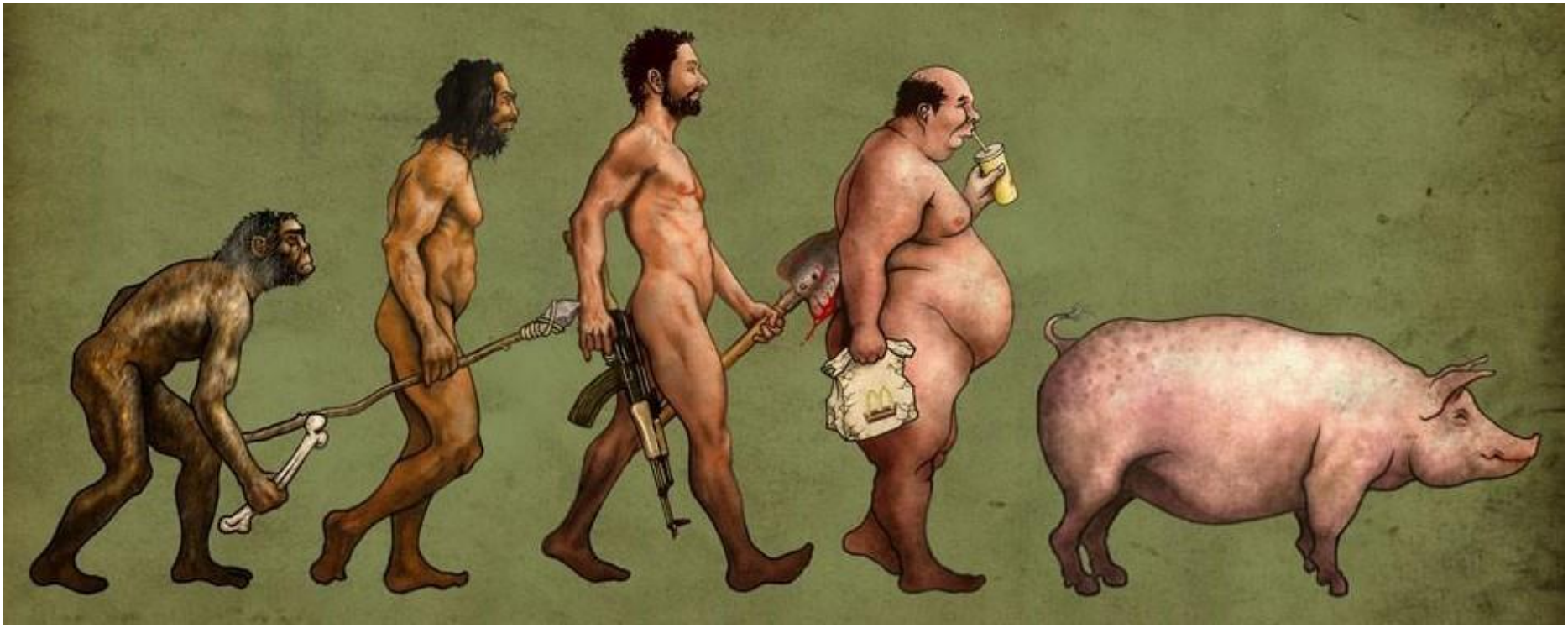
2030 **552 million**

International Diabetes Federation. *IDF Diabetes Atlas, 5th edn.* Brussels, Belgium: International Diabetes Federation, 2011.

The evolution of mankind…



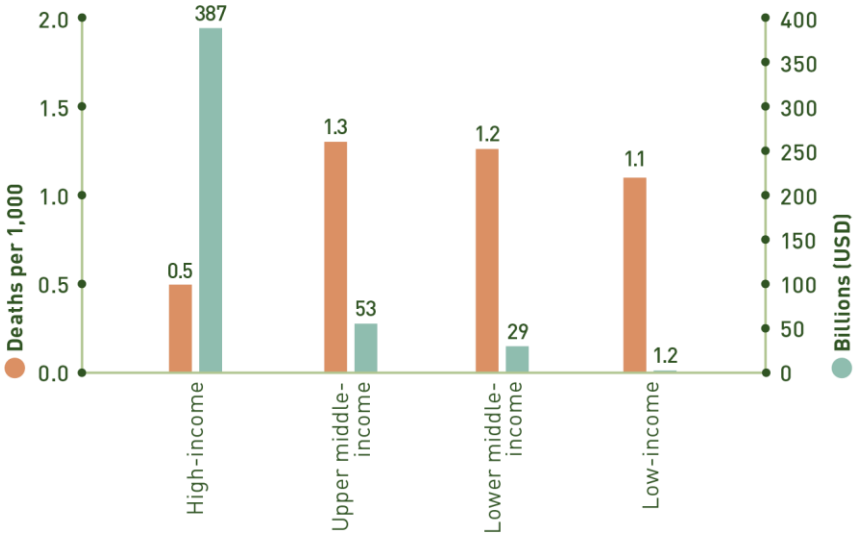
Inactivity



OBESITY

4.8 million people **died** and **471 billion USD** were **spent** due to diabetes in 2012.

HEALTHCARE EXPENDITURES AND DEATHS PER 1,000 DUE TO DIABETES BY INCOME GROUP



ADA DATA - MARCH 2013

- 41% increase in total cost of diabetes mellitus
  - $245 billion
  - 1 in $5 spent on health care goes to diabetes
- 43% on hospital inpatient costs

33% of direct cost burden of diabetes is in the lower extremity

(only 0,17% of research funding in the USA is spent on the diabetic foot!)

SOUTH AFRICA AND THE STATE OF DIABETES CARE

- Estimated population of 52.98 million
- Exact prevalence of diabetes is unknown
  - Estimated to be 5 – 7% of the population
    - Indians 11 – 13%
    - Coloureds 8 – 10%
    - Blacks 5 – 8%
    - Whites 4%
- ± 85% of these receive public (Government) sector medical care
  - Overburdened and inefficient
- ± 15% receive medical care in the private sector – paid for either by themselves or by medical insurance schemes

MEAN DIABETES-RELATED EXPENDITURE PER PERSON WITH DIABETES (USD) 2011

Botswana $816

South Africa $695

Namibia $468
Zimbabwe $56
Mozambique $37
Zambia $125
Tanzania $40
DRC $25
Malawi $31

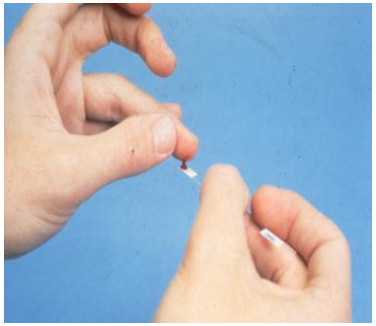
Brazil $1038
USA $8468
UK $4267
Australia $4878
Canada $5106
Luxembourg $9341

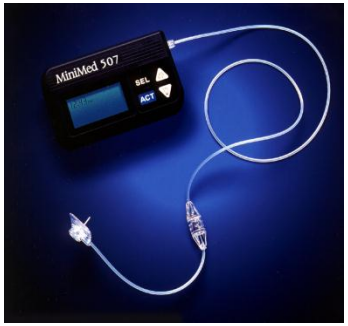
International Diabetes Federation. *IDF Diabetes Atlas, 5th edn.* Brussels, Belgium: International Diabetes Federation, 2011.
http://www.idf.org/diabetesatlas

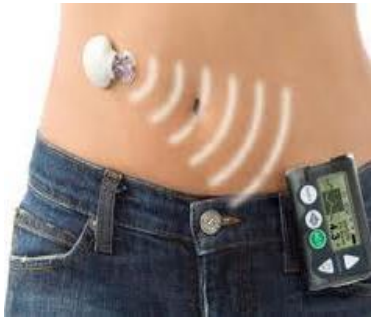
DIABETES MANAGEMENT
IS GETTING MORE COMPLEX AND COSTLY

Urine Sugar → Blood Sugar → MDI /Analogs → CGM → closed loop
Pens, Pumps smart phone

pre 1980 1980s 1990s 2000s 2013







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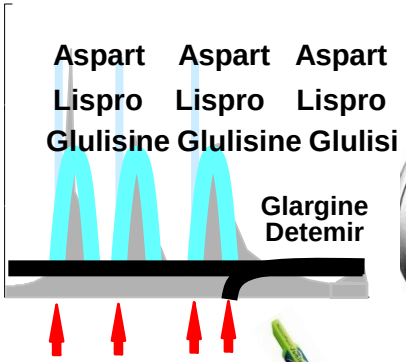


THE DIABETIC FOOT

- Nearly 80% of all non traumatic amputations occur in diabetics
- 85% of these begin with a foot ulcer
- 1 in 4 people with diabetes will have an ulcer in their lifetime
- 50% of these will become infected
- 50% of patients who have a foot ulcer die within 5 year

- Diabetic foot sepsis = amputation= loss of bipedalism

CAUSES OF PREVALENCE OF DIABETIC FOOT PROBLEMS IN SOUTH AFRICA

Health Care Related

- Lack of Podiatrists (even in best hospitals)
- Insufficient experience of those undertaking foot care (surgeons, diabetologists, dermatologists)
- Central Distribution of “ Good” health care services.
- Shortage of finances

CAUSES OF PREVALENCE OF DIABETIC FOOT PROBLEMS IN SOUTH AFRICA

Health Care Related

- Lack of health insurance of thousands of patients
- Lack of health education (busy clinics, few national programs, media, ….)
- Insufficient national data about different health problems
- Setting priorities (underestimation of foot problems)

CAUSES OF PREVALENCE OF DIABETIC FOOT PROBLEMS IN SOUTH AFRICA

Patients related Factors

- High Prevalence of DM
- Walking barefoot
- Illiteracy
- Associated comorbidities
- Poor compliance of patients

THE AMPUTATION RATE IN SOUTH AFRICA?

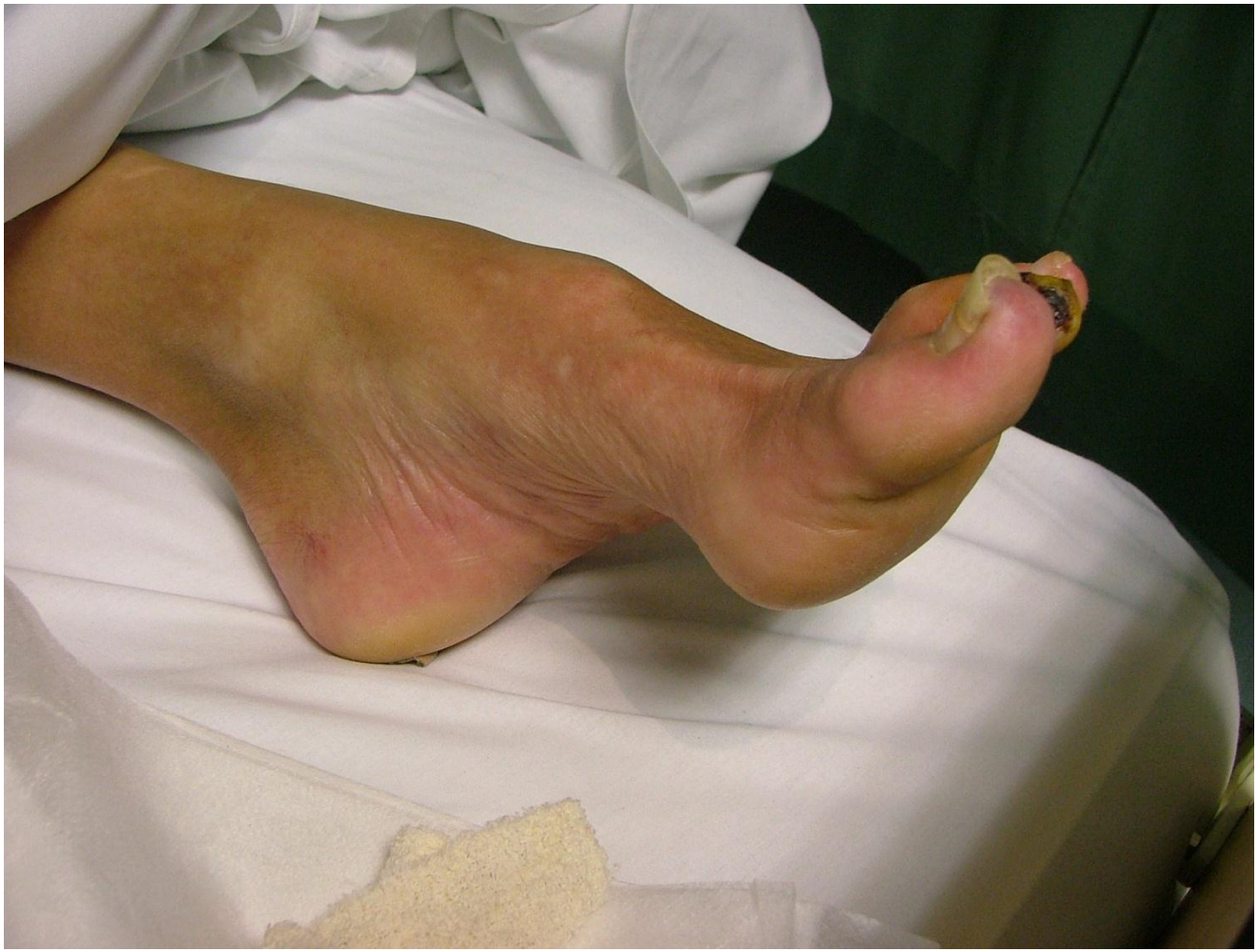
- **Published data** shows a **60,2%** rate of non traumatic lower limb amputation accountable to diabetes in public hospitals
- **Unpublished data** from two separate public hospitals showed an amputation rate of **78,5%** however
- **Limb salvage rate** in a multidisciplinary clinic in a **private hospital** by contrast is **85%** over a three year period

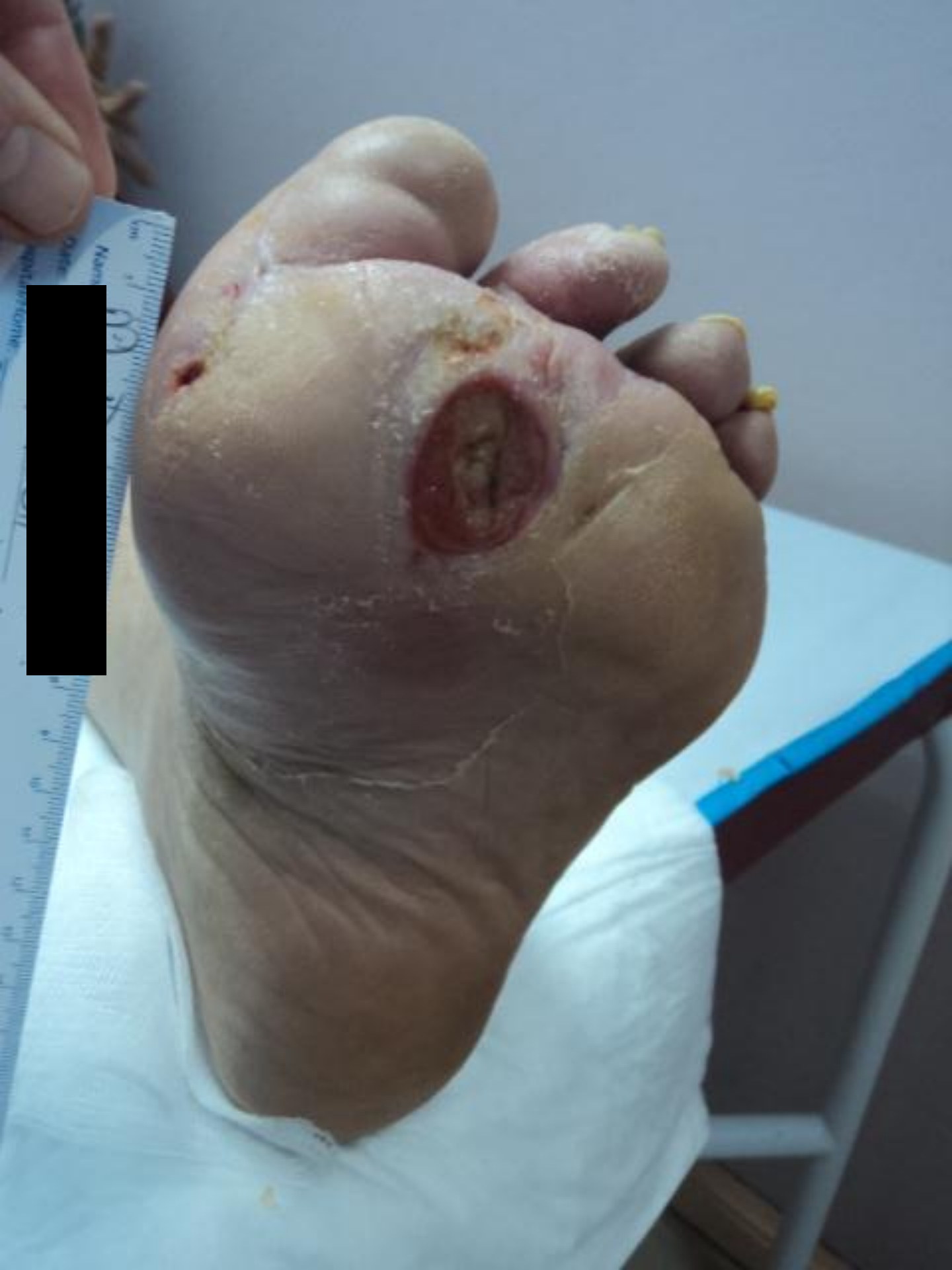
CONSIDER INFECTION IN ANY FOOT WOUND IN A DIABETIC PATIENT

- Evaluate at 3 levels
  - patient as a whole
  - affected foot
    - arterial ischemia
    - venous insufficiency
    - presence of protective sensation
    - biomechanical problems
  - infected wound

EURODIALE

- PAD and peripheral neuropathy are both well known risk factors for diabetic foot ulceration and foot infection
- PAD and infection
  - PAD present in diabetes = X 5.5 increased risk for diabetic foot infection
  - 3x increase risk of amputation





SYSTEMIC EVALUATION

- ECG, stress test and even coronary angiography with intervention may be required
- Renal status and creatinine clearance
- Pulmonary function and chest preparation
- Control of diabetic status
- Identification and control of active infection

PHYSICAL EXAMINATION OF THE FOOT

- Presence of peripheral pulses
- Bruit
- Skin temperature and colour
- Hair loss, muscle and skin atrophy
- Dependant hyperaemia
- Skin ulceration or tissue loss

INFECTION?

- Erythema
- Swelling
- Induration
- Tenderness
- Malodor

Factors associated with increased risk of infection

- Positive probe to bone test
- Ulcer duration more than 30 days
- Traumatic wound
- Presence of PAD and PND
- Previous amputation
- Renal insufficiency
- History of walking barefoot

SIGNS OF POSSIBLE IMMINENT LIMB-THREATENING INFECTION

- Systemic inflammatory response
- Rapid progression of infection
- Extensive necrosis or gangrene
- Crepitus on examination or tissue gas on imaging
- Extensive ecchymoses or petechiae
- Bullae, especially hemorraghic
- Pain out of proportion to clinical findings
- Recent loss of neurologic function
- Critical limb ichemia
- Extensive soft tissue loss
- Extensive boney destruction, especiallymidfoot/hindfoot
- Failure of infection to improve with appropriate Rx

INFECTIONS

- Mild
- Moderate
- Severe

TEXAS CLASSIFICATION

	0	I	II	III
A	Lesion completely epithelialised 0%	Superficial wound, not involving tendon capsule or bone 0%	Wound penetrating to capsule or tendon 0%	Wound penetrating to joint or bone 0%
B	Infection 12.5%	Infection 8.5%	Infection 28.5%	Infection 92%
C	Ischemia 25%	Ischemia 25%	Ischemia 25%	Ischemia 100%
D	Infection and ischemia 50%	Infection and ischemia 50%	Infection and ischemia 100%	Infection and ischemia 100%

IDSA IWGDF CLASSIFICATION OF DIABETIC FOOT INFECTION

Clinical manifestation of infection32mmHg	PEDIS grade	IDSA infection severity
No symptoms or signs of infection	1	Uninfected
Infection present, as defined by the presence of at least 2 of the following •Local swelling or induration •Erythema •Local tenderness or pain •Local warmth •Purulent discharge		
Local infection involving skin and subcutaneous tissue without involvement of deeper tissue and no systemic signs. Erythema >0,5 cm to ≤2cm around the ulcer Exclude other causes of inflammatory response (acute Charcot, trauma, gout fracture)	2	Mild
Local infection with erythema >2cm or involving structures deeper then skin and subcutaneous tissues **and** no SIRS	3	Moderate
Local infection with signs of SIRS with ≥2 of following •Temperature >38° or <36°C •Heart rate >90 beats/min •Respiratory rate >20 breaths/min or PaCO2 <32 mmHg •WBS >12 000 or < 4000 or ≥10% immature forms	4	Severe

INFECTION

- Polymicrobial →
  - Aerobic gram+ cocci → staphylococci, beta-hemolytic streptococci
  - Warm climates and exposure to water, gram-bacilli pseudomonas, E. coli
  - + aerobic bacilli in chronic wounds
  - Obligate anaerobes in ischemic / necrotic wounds
  - MRSA in diabetic foot wounds ranges from 5 to 30%
    - usually if previously hospitalised

Antibiotic regimens

- Clinically uninfected?
  - No antimicrobial therapy
- Clinically infected?
  - Select antibiotic targeting likely pathogen
  - As narrow spectrum as possible
  - Empirical choice should cover
    - Staphylococcus aureus
    - Gram + aerobic streptococci
- Only severe infections require IV Rx
  - Mild to moderate – 1 to 2 weeks Rx
  - Serious – 4 weeks of Rx

SUGGESTED ROUTE, SETTING AND DURATION OF Antibiotic Rx

Site of infection, by severity or extent	Route of administration	Setting	Duration of therapy
SOFT TISSUE ONLY			
Mild	Topical or oral	Outpatient	1-2 weeks
Moderate	Oral (or initial IV)	Outpatient/inpatient	1-3 weeks
Severe	Initial IV, switch to oral when possible	Inpatient, then outpatient	2 – 4 weeks
BONE OR JOINT			
No residual infected tissue	IV or oral	…	2-5 days
Residual infected soft tissue (not bone)	IV or oral	…	1-3 weeks
Residual infected(but viable) bone	Initial IV, consider oral switch	…	4-6 weeks
No surgery or residual dead bone	Initial IV then oral switch		≥3 months

SUGGESTED EMPIRIC ANTIBIOTIC REGIMENS BASED ON CLINICAL SEVERITY FOR DIABETIC FOOT INFECTIONS

Infection Severity	Probable Pathogen(s)	Antibiotic Agent	Comments
Mild (usually treated with oral agent[s])	*Staphylococcus aureus* (MSSA); Streptococcus spp	Dicloxacillin	Requires QID dosing; narrow-spectrum; inexpensive
		Clindamycin[a]	Usually active against community-associated MRSA, but check macrolide sensitivity and consider ordering a "D-test" before using for MRSA. Inhibits protein synthesis of some bacterial toxins
		Cephalexin[a]	Requires QID dosing; inexpensive
		Levofloxacin[a]	Once-daily dosing; suboptimal against *S. aureus*
		Amoxicillin-clavulanate[a]	Relatively broad-spectrum oral agent that includes anaerobic coverage
	Methicillin-resistant *S. aureus* (MRSA)	Doxycycline	Active against many MRSA & some gram-negatives; uncertain against streptococcus species
		Trimethoprim/ sulfamethoxazole	Active against many MRSA & some gram-negatives; uncertain activity against streptococci
Moderate (may be treated with oral or initial parenteral agent[s]) or severe (usually treated with parenteral agent[s])	MSSA; *Streptococcus* spp; Enterobacteriaceae; obligate anaerobes	Levofloxacin[a]	Once-daily dosing; suboptimal against *S. aureus*
		Cefoxitin[a]	Second-generation cephalosporin with anaerobic coverage
		Ceftriaxone	Once-daily dosing, third-generation cephalosporin
		Ampicillin-sulbactam[a]	Adequate if low suspicion of *P. aeruginosa*
		Moxifloxacin[a]	Once-daily oral dosing. Relatively broad-spectrum, including most obligate anaerobic organisms
		Ertapenem[a]	Once-daily dosing. Relatively broad-spectrum including anaerobes, but not active against *P. aeruginosa*
		Tigecycline[a]	Active against MRSA. Spectrum may be excessively broad. High rates of nausea and vomiting and increased mortality warning. Nonequivalent to ertapenem + vancomycin in 1 randomized clinical trial
		Levofloxacin[a] or ciprofloxacin[a] with clindamycin[a]	Limited evidence supporting clindamycin for severe *S. aureus* infections; PO & IV formulations for both drugs
		Imipenem-cilastatin[a]	Very broad-spectrum (but not against MRSA); use only when this is required. Consider when ESBL-producing pathogens suspected
	MRSA	*Linezolid*[a]	Expensive; increased risk of toxicities when used >2 wk
		Daptomycin[a]	Once-daily dosing. Requires serial monitoring of CPK
		Vancomycin[a]	Vancomycin MICs for MRSA are gradually increasing
	Pseudomonas aeruginosa	***Piperacillin-tazobactam***[a]	TID/QID dosing. Useful for broad-spectrum coverage. *P. aeruginosa* is an uncommon pathogen in diabetic foot infections except in special circumstances (2)
Infection Severity	Probable Pathogen(s)	Antibiotic Agent	Comments
	MRSA, Enterobacteriaceae, *Pseudomonas*, and obligate anaerobes	Vancomycin[f], ceftazidime, cefepime, *piperacillin-tazobactam*[b], aztreonam,[b] or a carbapenem[b]	Very broad-spectrum coverage; usually only used for empiric therapy of severe infection. Consider addition of obligate anaerobe coverage if ceftazidime, cefepime, or aztreonam selected

Non infected wound

- Should not be Rx with topical or systemic antibiotics
- After open bypass surgery
  - wait 4 to 8 days before definitive debridement
- After endovascular intervention
  - wait 3 to 4 weeks

OSTEOMYELITIS

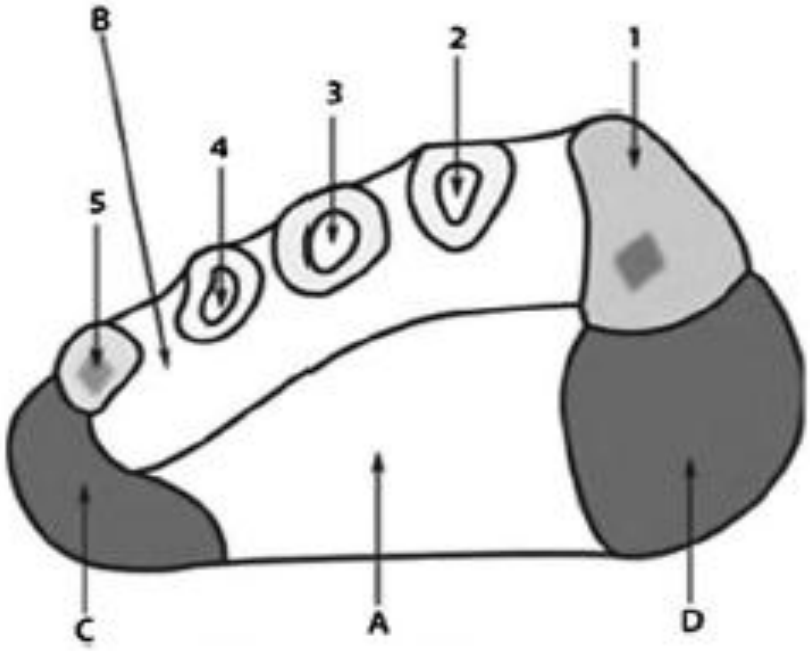
- Present in up to 20% of mild to moderate infections
- Present in 50% to 60% of severely infected wounds
- Consider in ulcers that are deep, large chronic or over a boney prominence
- Charcot difficult to distinguish from osteomyelitis and can co exist
- Radiographic changes of osteomyelitis may lag clinical disease by up to a month
- Antibiotic Rx based on culture results of bone
- Prolonged course of antibiotics (3-6 months) has a clinical success rate of 65%-80% in diabetic foot osteomyelitis

Wound

- Surgical debridement of dead tissue
- Appropriate antibiotic Rx
- Removing pressure off the wound
- Improve blood flow to the infected area

- Deep tissue specimen the best
- Superficial wound swabs often contaminated
- 50% volume decrease in 4 weeks or 10 to 15% decrease each week
- 40% of amputations are preventable with appropriate wound care

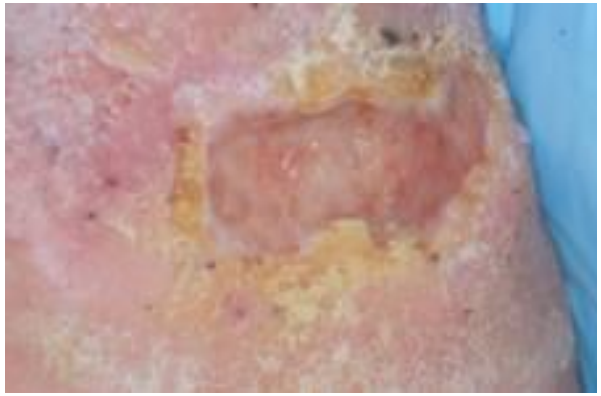
Schematic diagram of cross-section of the foot.
Numbers 1 to 5 indicate metatarsal bones.
A,central plantar space; B,deep interosseous space;
C, lateral plantar space; D,medial plantar space



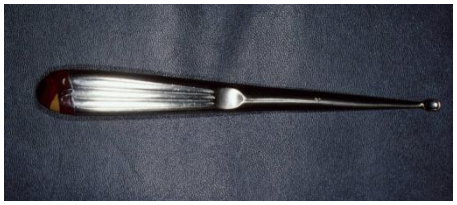
BASIC TOOLS OF DEBRIDEMENT

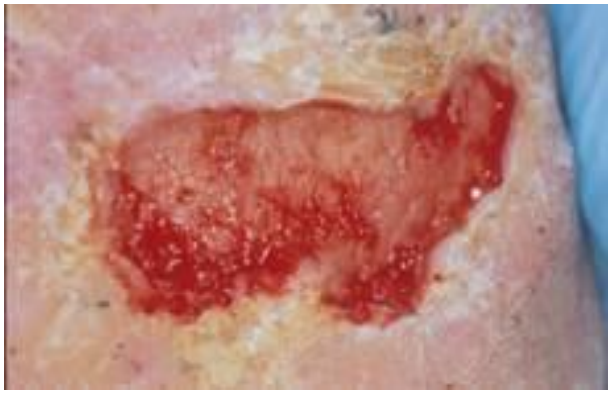
- Blades
- Forceps
- Scissors
- Curettes
- Rongeurs

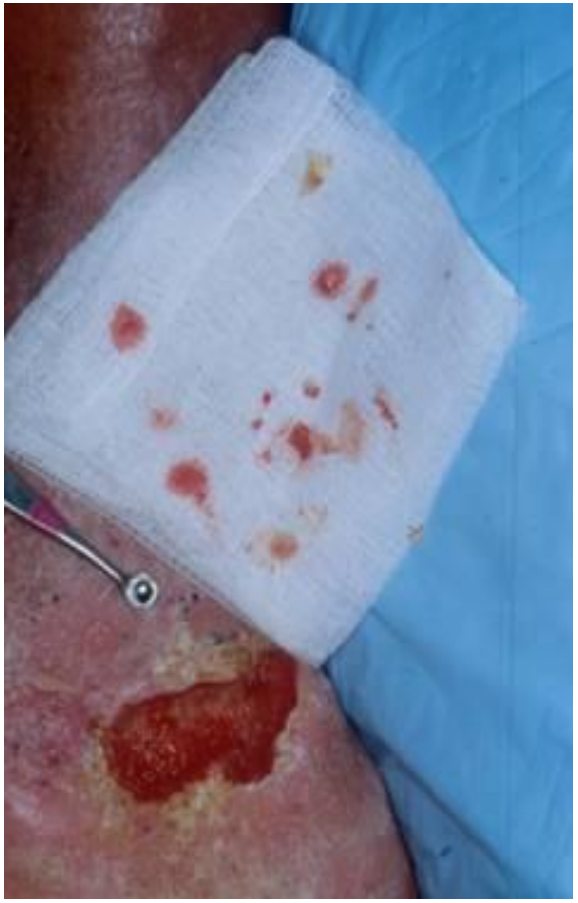
OFFICE DEBRIDEMENT: CURETTE



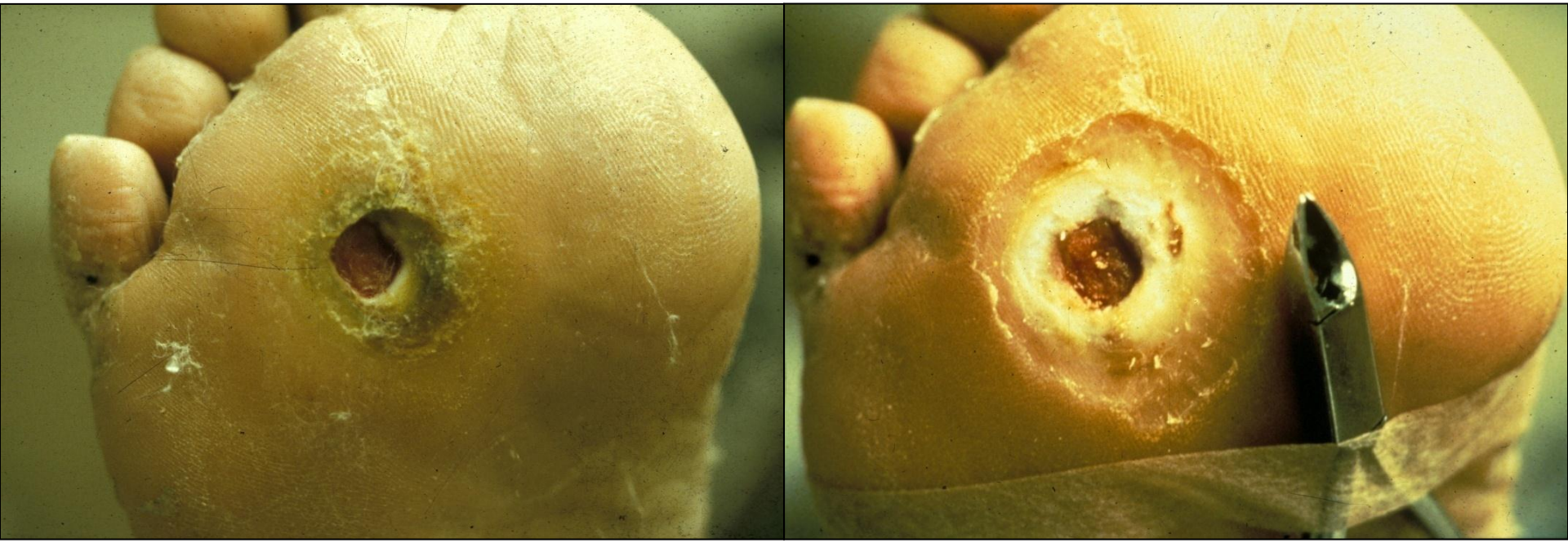
remove biofilm on top of wound







OFFICE DEBRIDEMENT:
SURGICAL BLADE OR NIPPERS

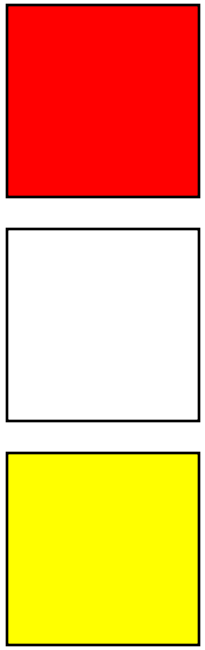


No 15 blade !

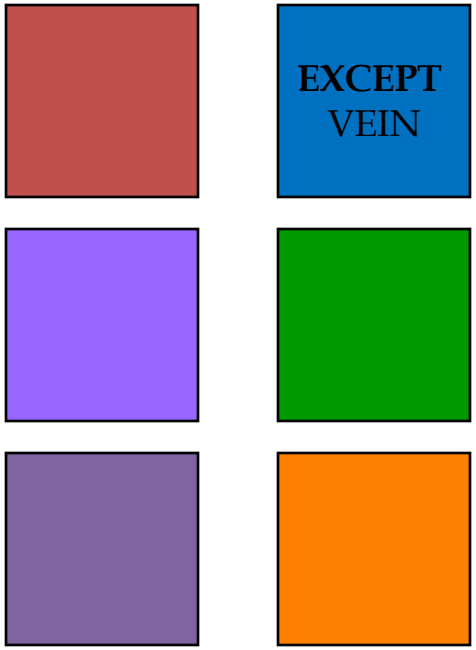
IDENTIFYING DEAD TISSUE

COLOUR CODING FOR IDIOTS

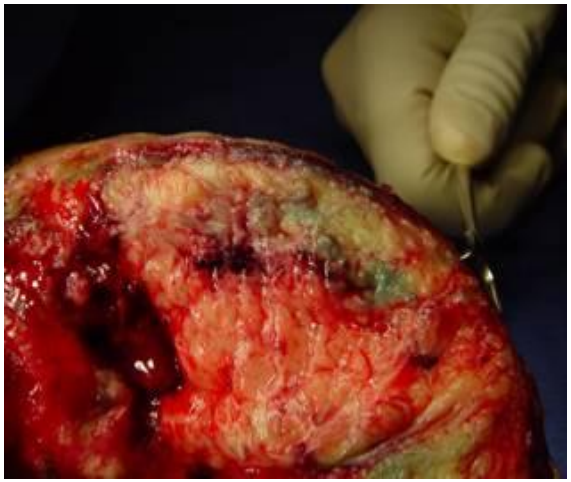
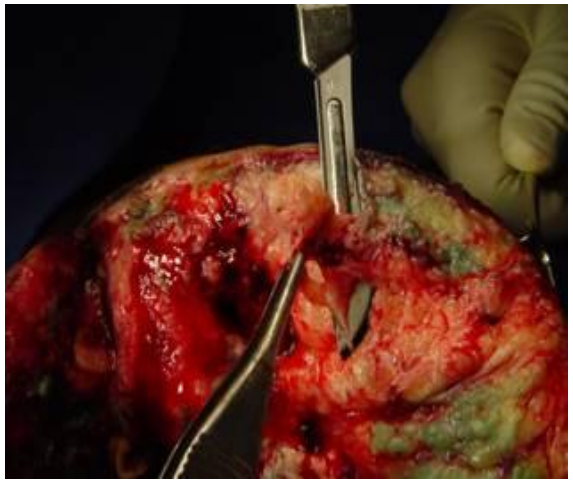
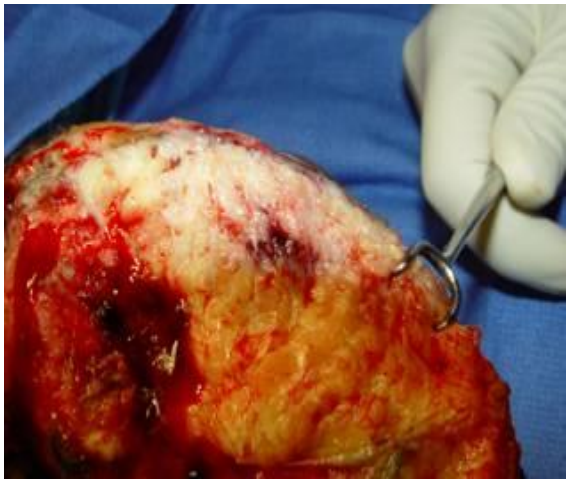
- **Good**



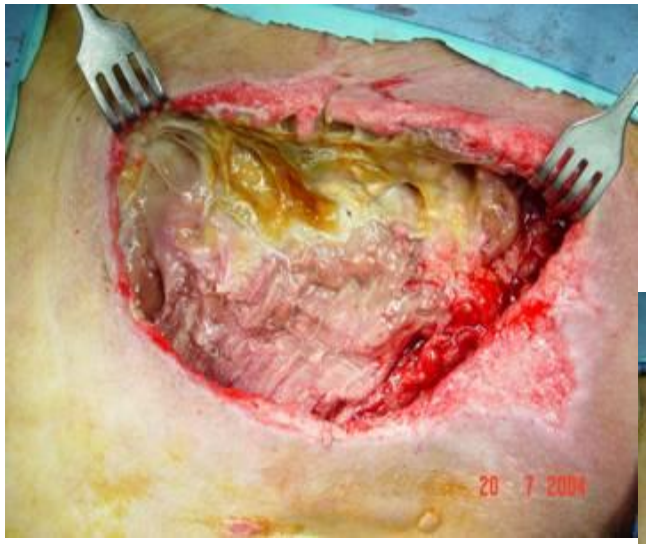
- **Bad**

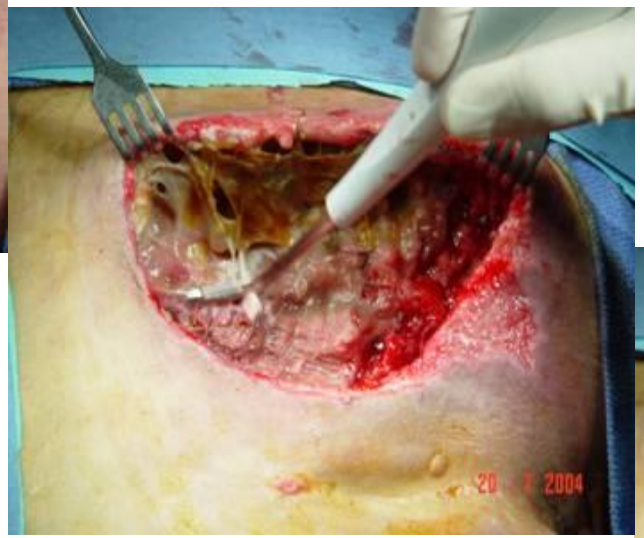


IDENTIFYING DEAD TISSUE:
CLOTTED VEINS

DEBRIDEMENT OF NECROTIC MUSCLE





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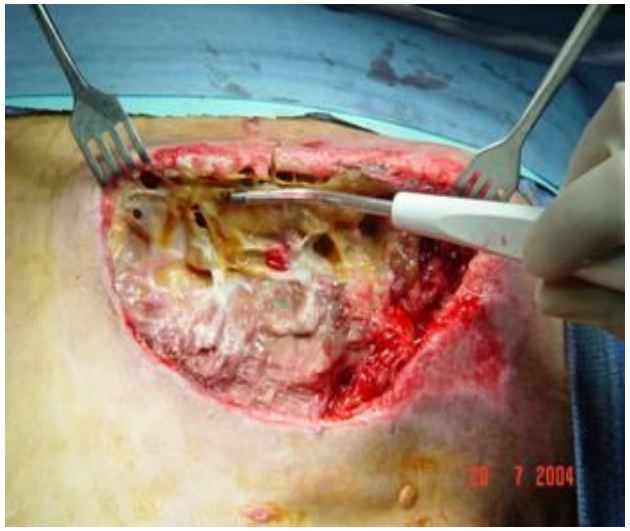
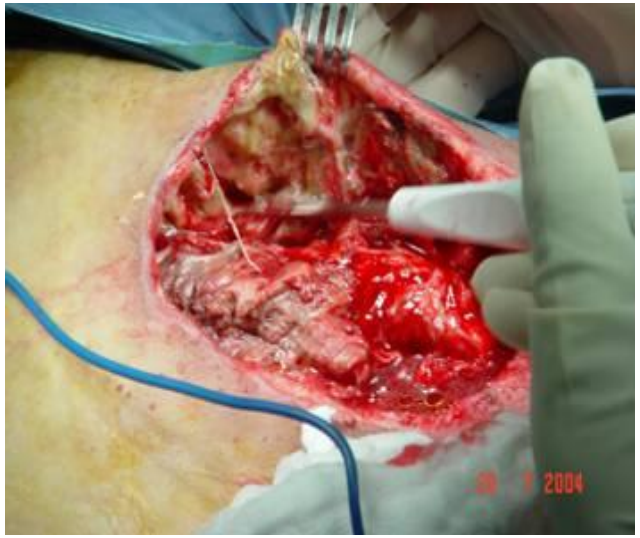
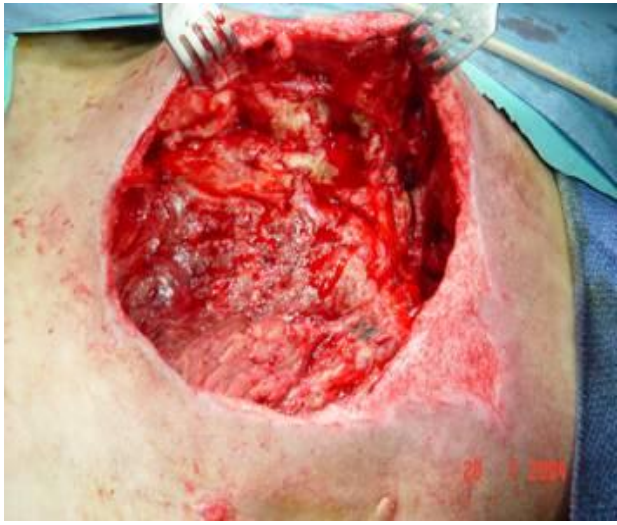
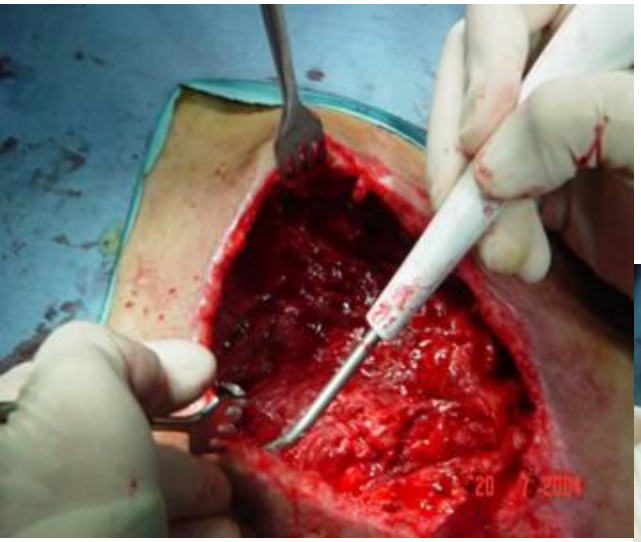
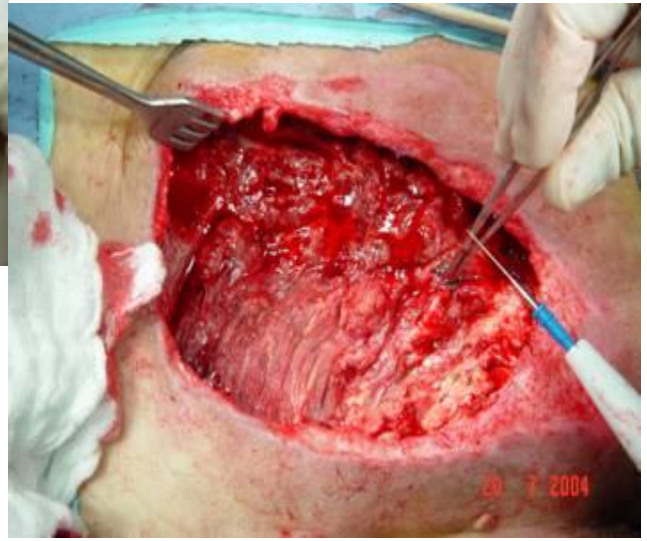




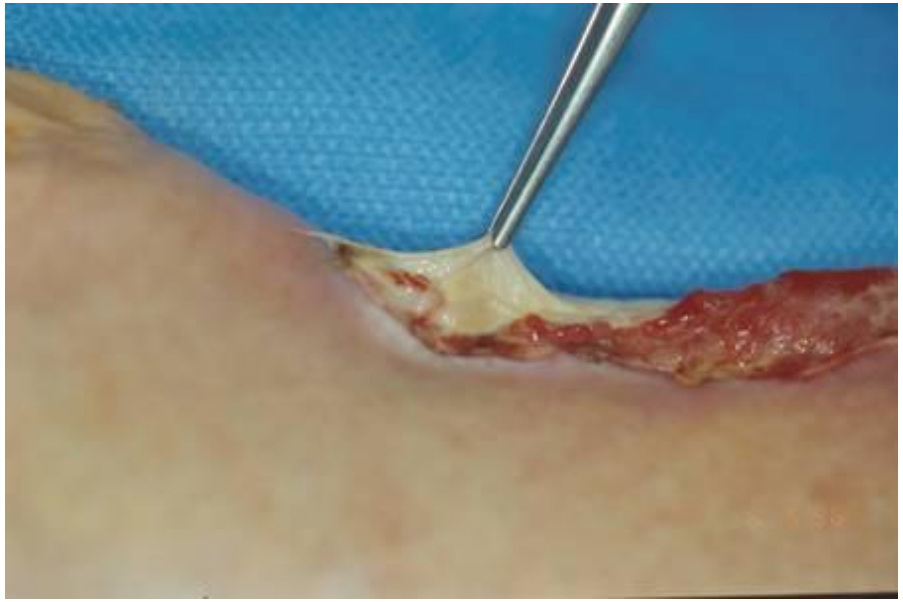


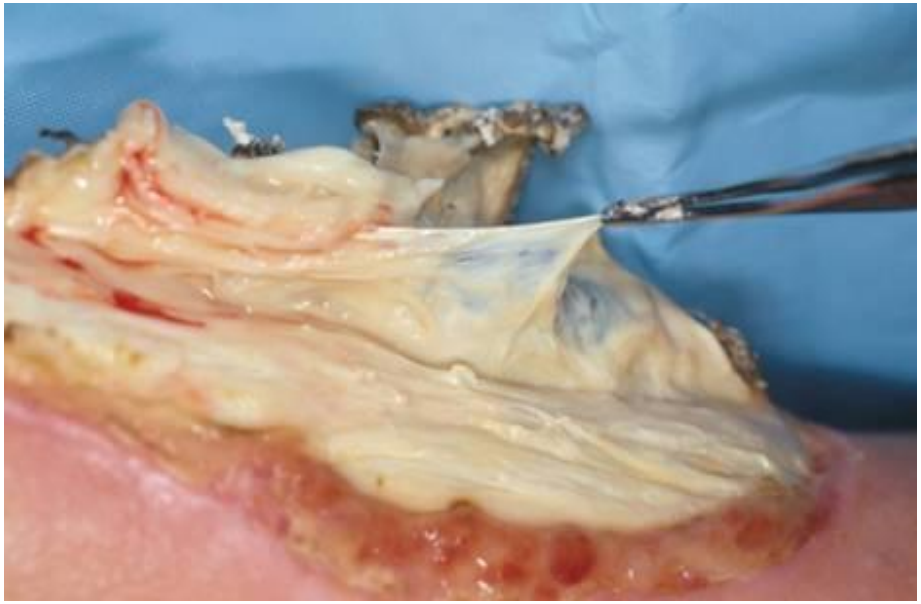
DEBRIDEMENT OF NECROTIC MUSCLE



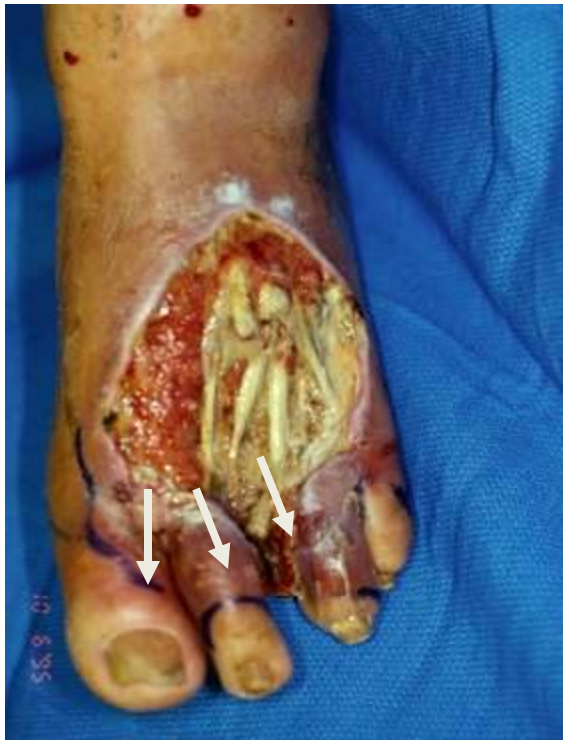


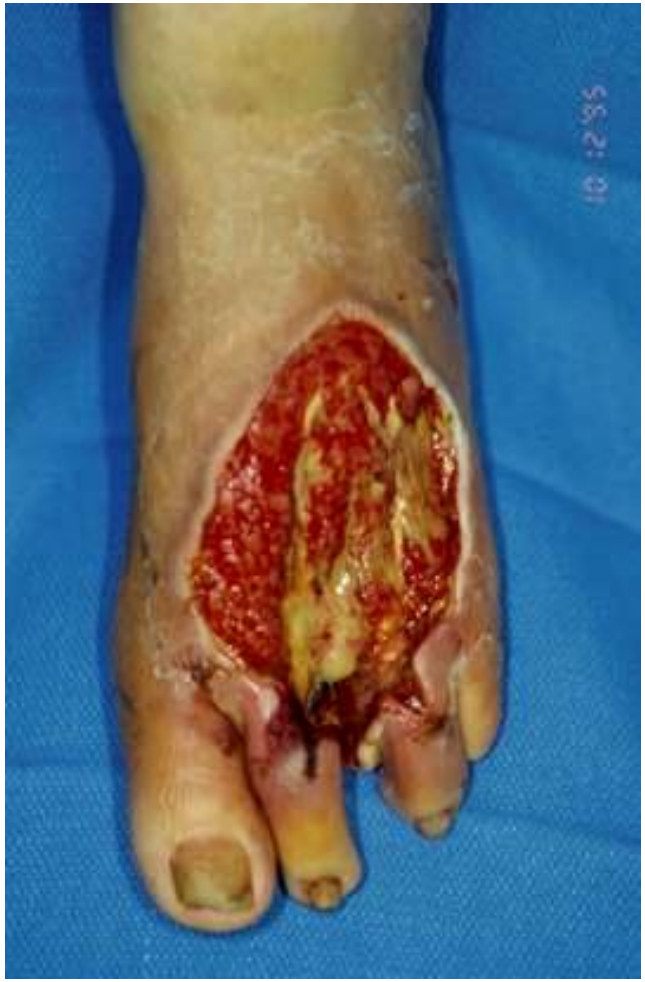
IDENTIFYING DEAD TISSUE: LIQUIFIED FASCIA



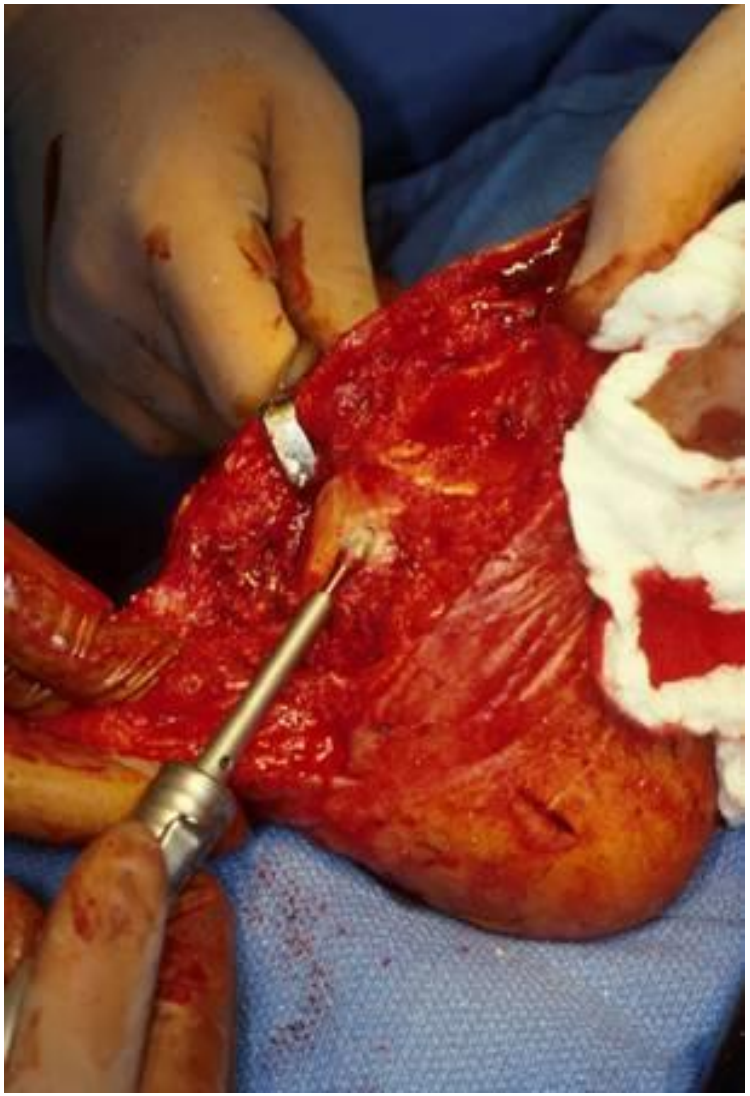


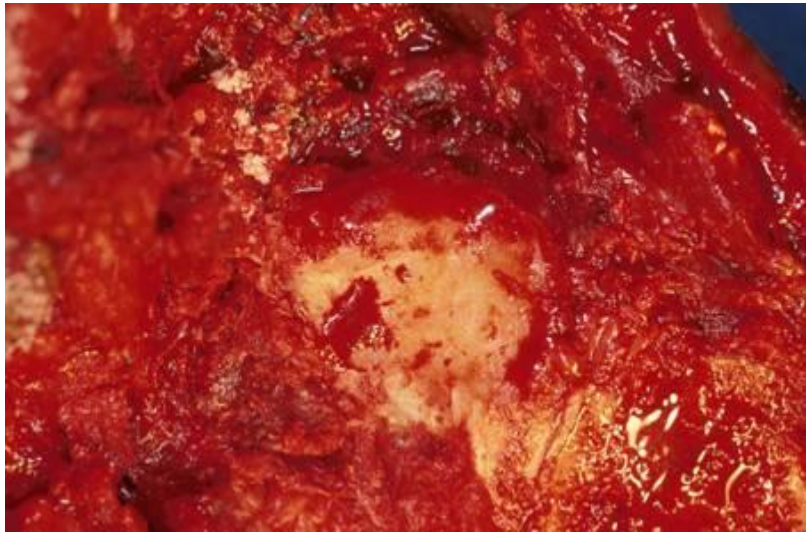
DEBRIDING FASCIA / TENDON:
DEAD TENDON = INFECTION



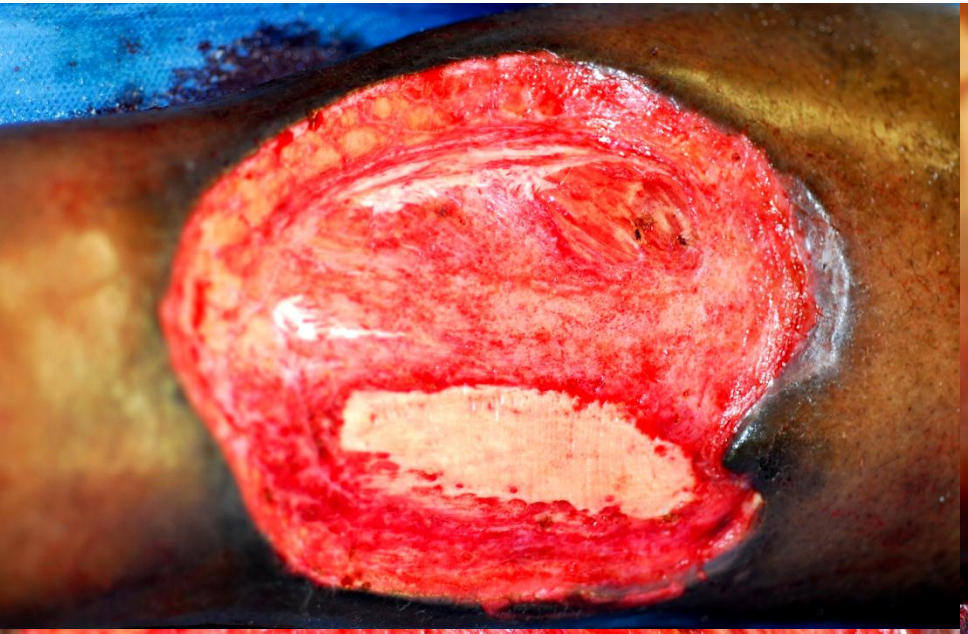


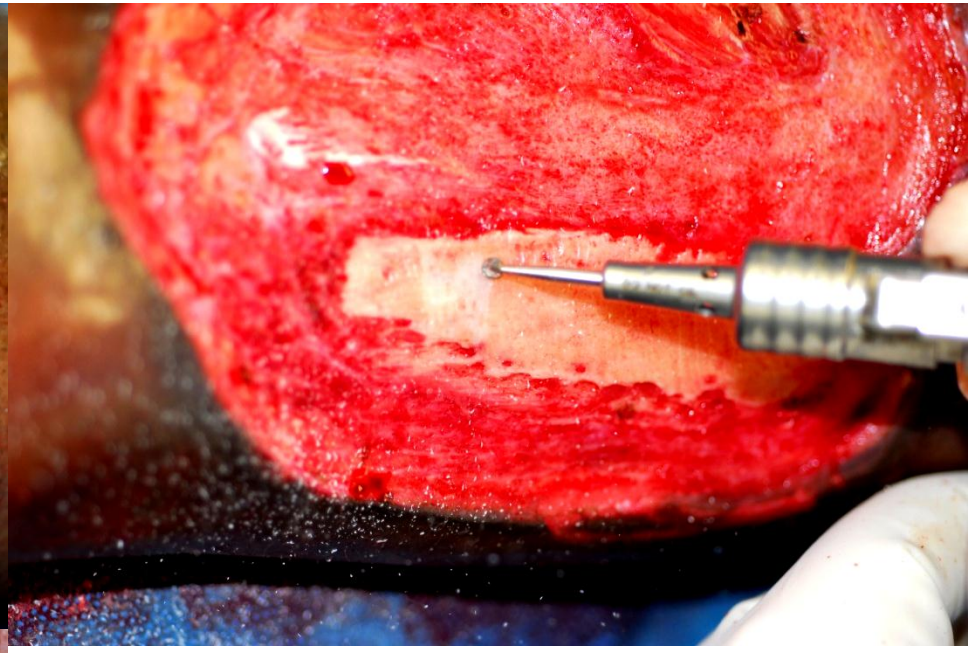
DEBRIDING BONE: PUNCTATE BLEEDING

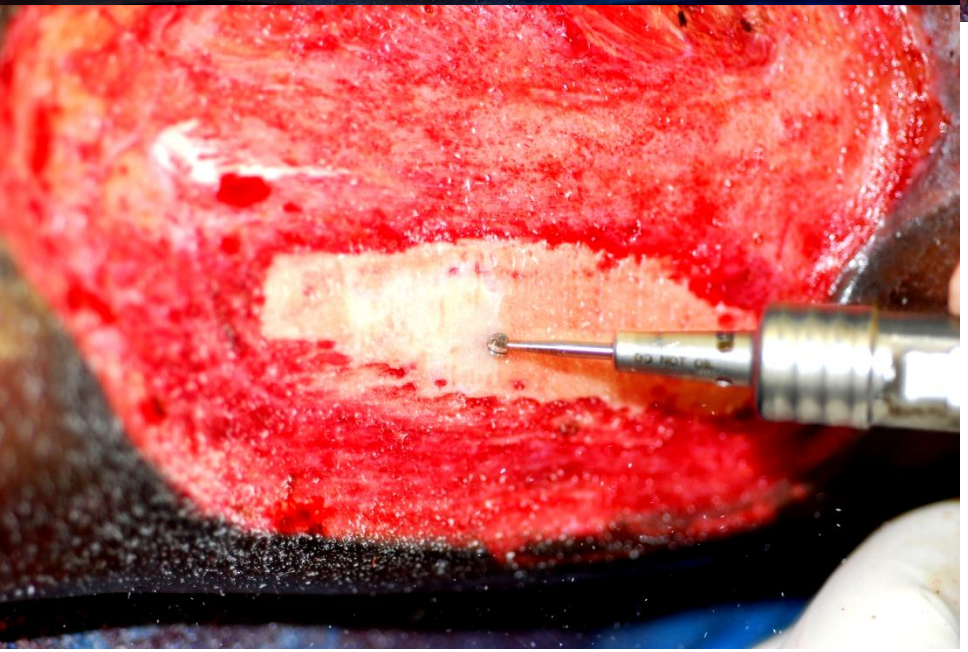


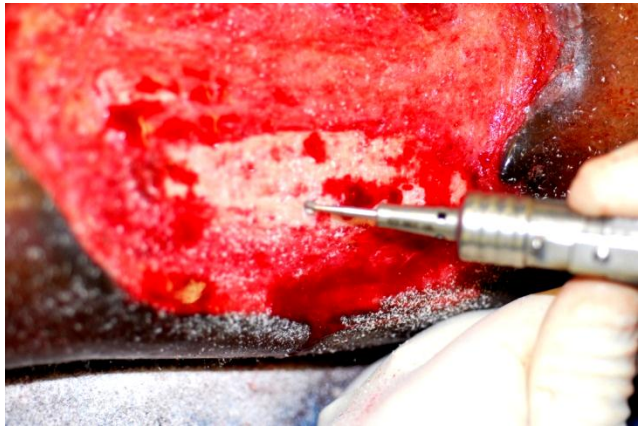


"paprika sign"





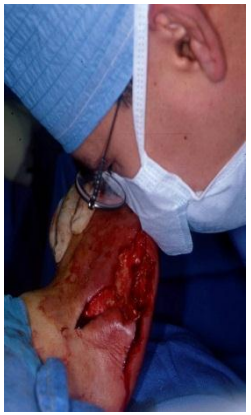




Debridement

stop when….

only normal
tissue
remains
&
odour
gone



WHEN IS OBTAINING A BONE SPECIMEN FOR CULTURE AND HISTOLOGY JUSTIFIED?

- When there is uncertainty regarding the diagnosis of osteomyelitis despite clinical and imaging evaluations
- An absence (or confusing mix) of culture data from soft tissue specimens
- Failure of the patient to respond to empiric AB Rx

RECOMMENDATIONS FOR COLLECTION OF SPECIMENS FOR CULTURE FROM DIABETIC FOOT WOUNDS

- Do
  - Obtain an appropriate specimen for culture from almost all infected wounds
  - Cleans and debride the wound before obtaining specimen for culture
  - Obtain a tissue specimen for culture by scraping with a sterile scalpel or dermal curette or biopsy from the base of a debrided ulcer
  - Aspirate any purulent secretions using a sterile needle and syringe
  - Promptly send specimens in a sterile container for aerobic and anaerobic culture
- Do not
  - Culture a clinically uninfected lesion, unless for specific epidemiological purposes
  - Obtain a specimen for culture without first cleansing or debriding the wound
  - Obtain a specimen for culture by swabbing the wound or wound drainage

Entropy

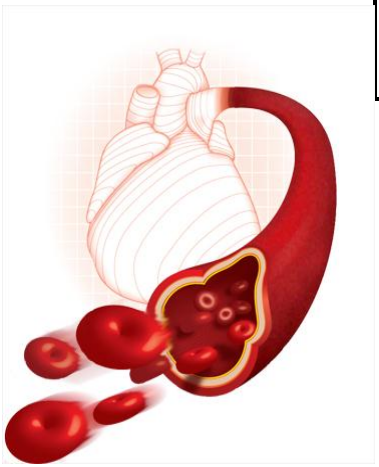
- Common to all systems
- Tend from a state of order to a state of chaos
- Young patient….. held in check by the body's intrinsic system of repair and regeneration
- Older and immune supressed patient…. This process is abandoned by the body
- It does not cause disease but it leaves an organism vulnerable
- Disease takes hold where the system is weakest
- In humans???
- The cardiovascular system

Diabetic Vascular Disease

Hyperglycemia

Retina, Kidney, Nerves
Myocardium

Microvascular disease



Hyperglycemia
Hypertension
Hyperlipidemia

Large Arteries

Increased Rate of Atherosclerosis

Sustained decrease of major amputation in diabetic patients- an analysis of a 20 year period in a defined population

Larsson J, Eneroth M, Apelqvist J et al *Acta Orthop* 2008

- When vascular evaluations and interventions were increased during a 20 year population based study on diabetics there was a **57%** relative decrease in major amputations

INDICATION FOR RX

Any diabetic in whom pulses are not easily palpable, has a critically ischemic limb until proven otherwise.

Factors related to outcome of neuroischemic/ischemic foot ulcer in diabetic patients
Apelqvist J, Elgzyri T, arsson J et al *J Vasc Surg* 2011

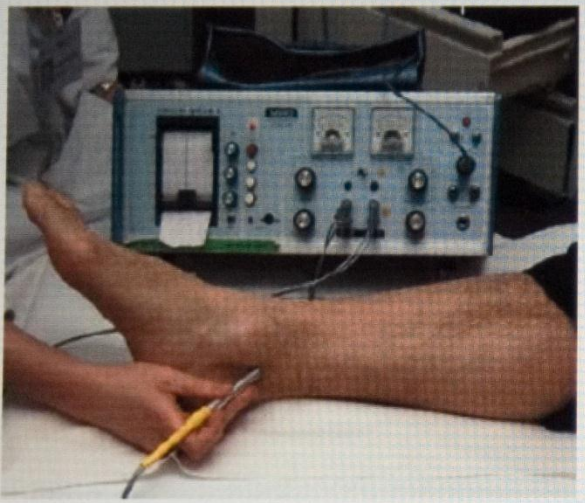
- 1151 diabetic patients with neuro ischemic ulceration
- < 50% considered ischemic prior to non-invasive testing

DIAGNOSTIC MODALITIES

- Noninvasive Investigation
  - ABI ankle/brachial index (Doppler)
  - Segmental arterial pressures
  - Toe pressure and toe/brachial index
  - Spectral waveform analysis
  - Percutaneous pO_2 measurement

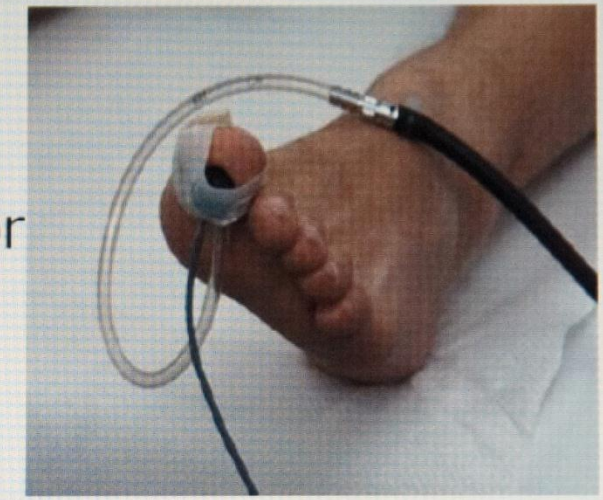
- Imaging Studies
  - Duplex Doppler with colour flow
  - Conventional angiography (Gold Standard)
  - MRI angiography
  - CT angiography

NON INVASIVE INVESTIGATION



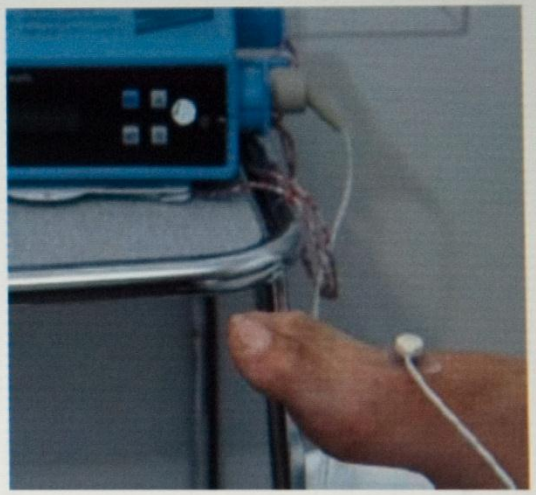
Ankle pressure
< 50 (-70) mmHg

or



Toe pressure
< 30 (-50) mmHg

and



TcpO2
< 20-30 mmHg
< 60 mmHg (sitting/O_2)

ABPI – CONSENSUS STATEMENT

- Diabetic > 50yrs
  - Screening ABPI in all diabetics
  - Repeat every 5 years if test is normal
- Diabetic < 50 yrs
  - Screening ABPI if other PAD risk factors present
    - Smoking, hypertension, hyperlipidemia, duration of diabetes > 10yrs
- Diagnostic ABPI in any diabetic with PAD symptoms; together with treadmill testing if ABPI and clinical symptoms do not correlate

IDEAL NON-INVASIVE TEST = TOE PRESSURES

- Should be approximately 60% of brachial pressure
- Toe pressures
  - > 45 mmHg = 85% primary healing
  - < 45 mmHg = 36% healing without amputation

TcPO2 levels

< 34 mmHg (amputation 85%)

indicates the need for revascularization

> 34 < 40 mmHg (amputation 20%)

less pressing, although there remains a considerable probability of amputation

> 40 mmHg

revascularization is dependent on the severity of tissue loss and possible morbidity caused by the procedure

Faglia E, Clerici G, Caminiti M et al. Predictive values of transcutaneous oxygen tension for above-the-ankle amputation in diabetic patients with critical limb ischemia. Eur J Vasc Endovasc Surg. 2007 Jun;33(6):731-6

SOUNDS

- Doppler sounds are described as either tri-, bi- or monophasic.
- Triphasic flow indicates normal arterial flow; the pulse curve has three components.
- Biphasic flow implies a loss of one component and mildly compromised flow.
- Monophasic flow, in contrast, indicates arterial compromise either due to a significant stenosis or narrowing or occlusion of the artery.

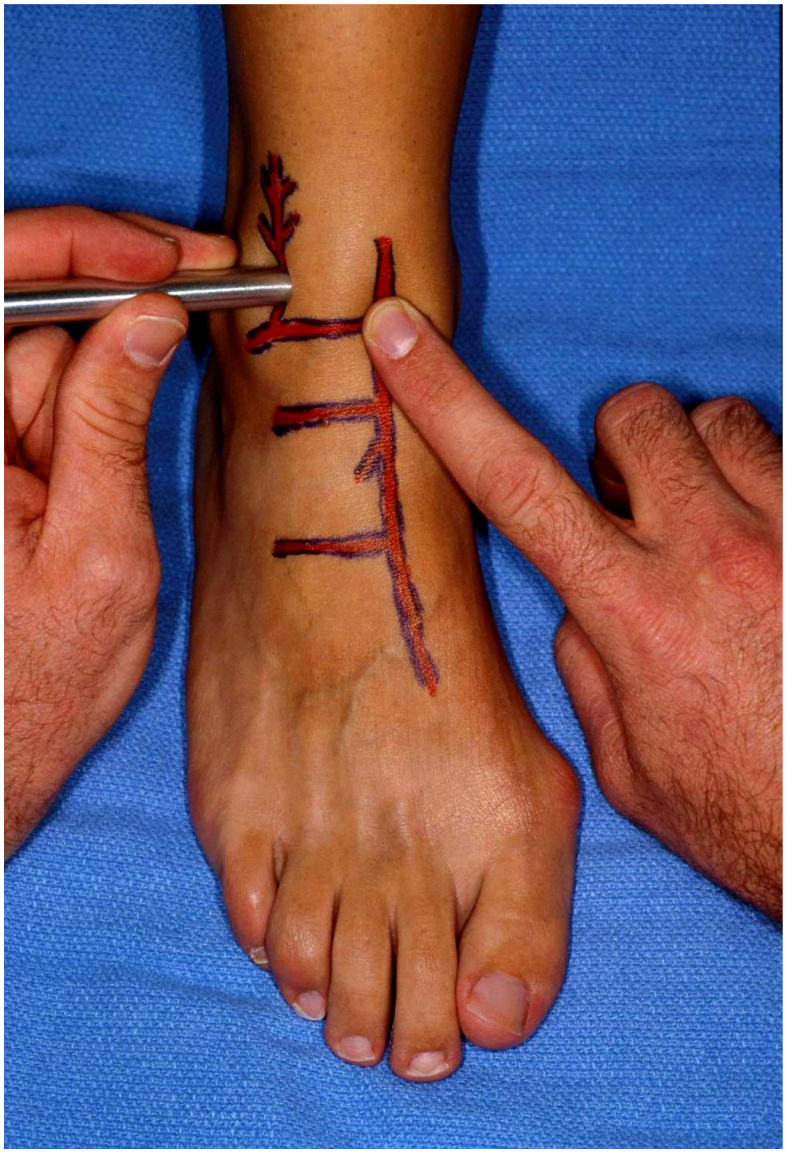
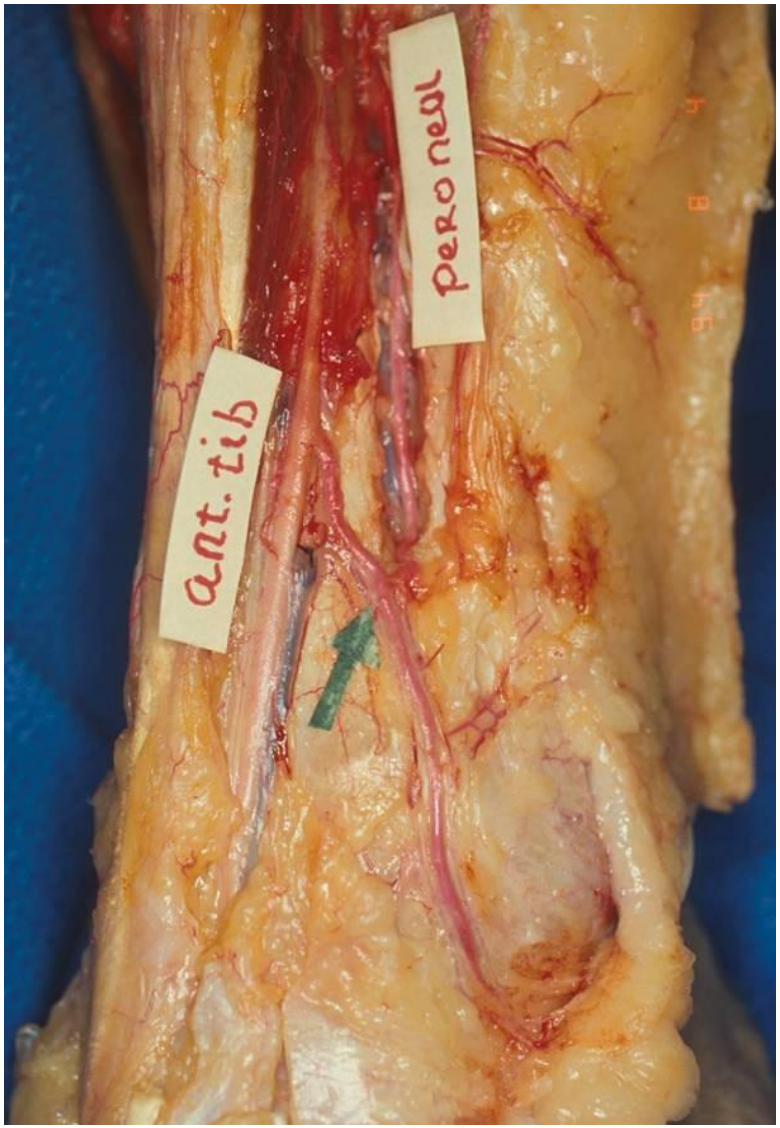


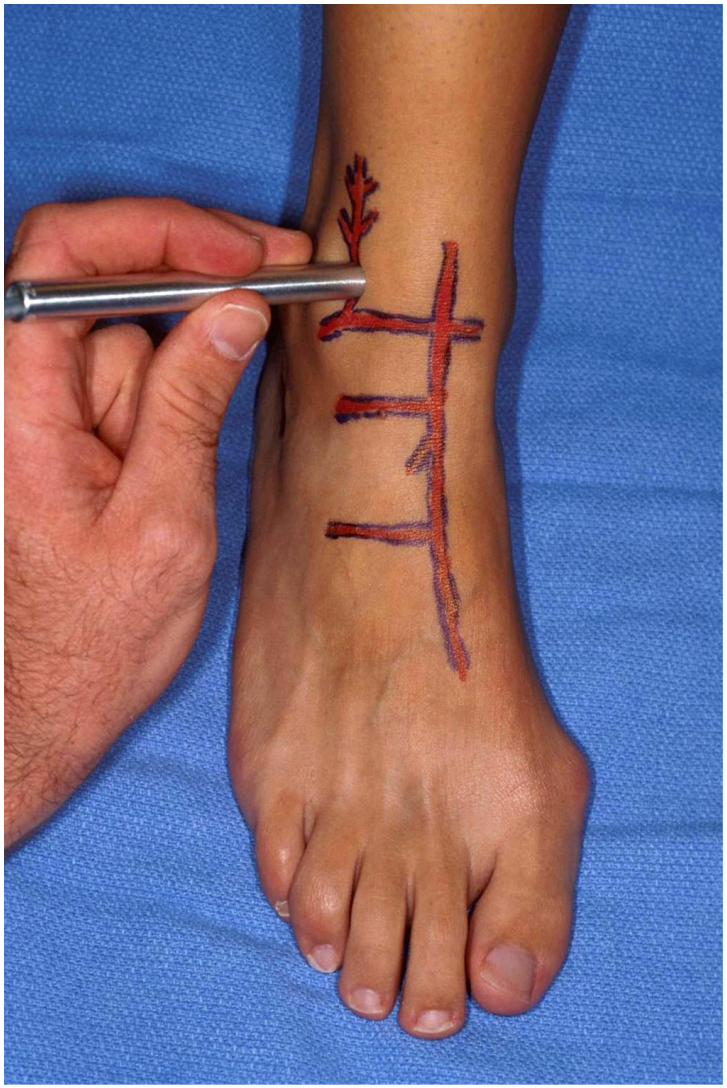
Fig 7: <u>Arterial↔arterial connections:</u>
By occluding arteries proximal or distal to the arterial signal, it is possible to assess the direction of arterial flow



Direct vascular connections:

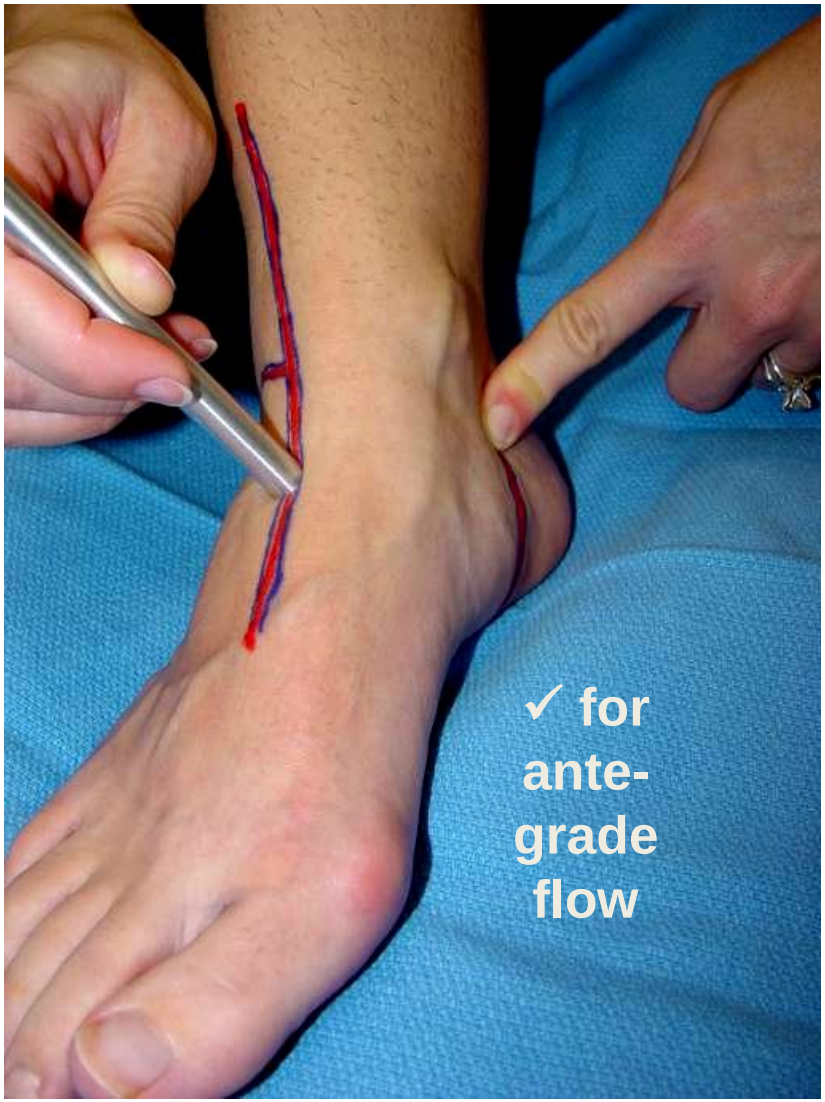
arterial ↔ arterial connections

All the main arteries of the foot and ankle are directly connected to one another



Doppler: peroneal artery: anterior perforating branch

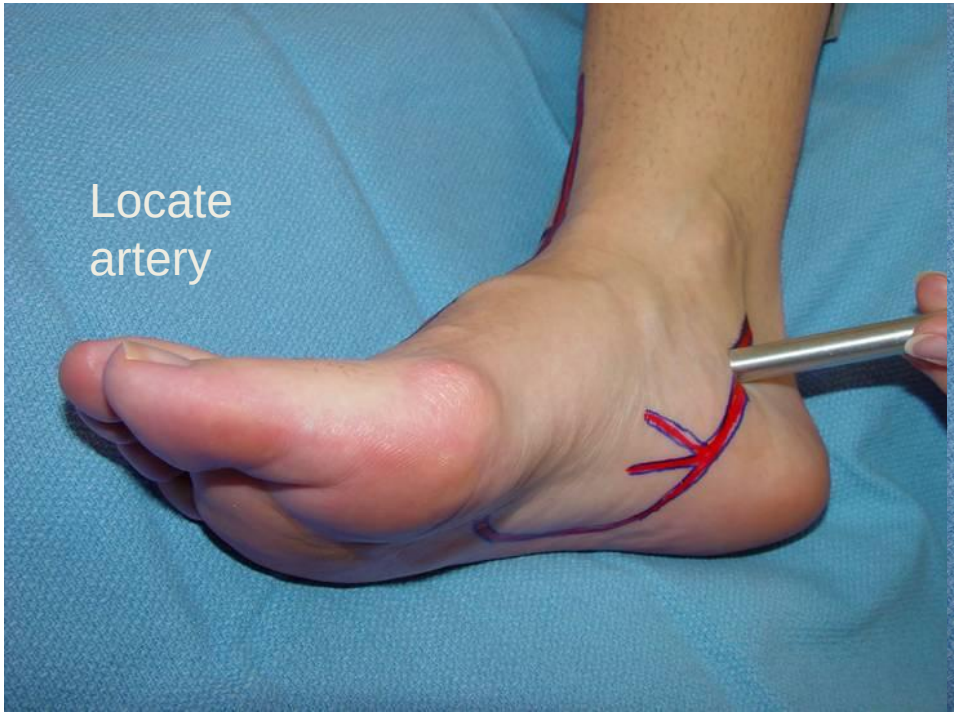
Doppler anterior perforating branch of the peroneal artery just medial to distal fibula

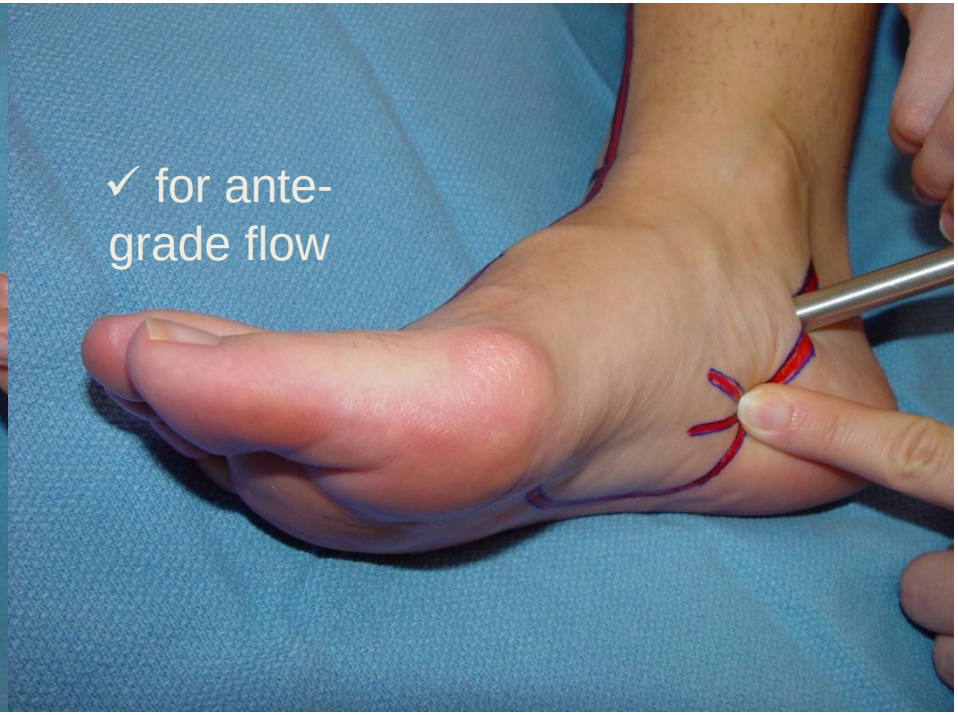


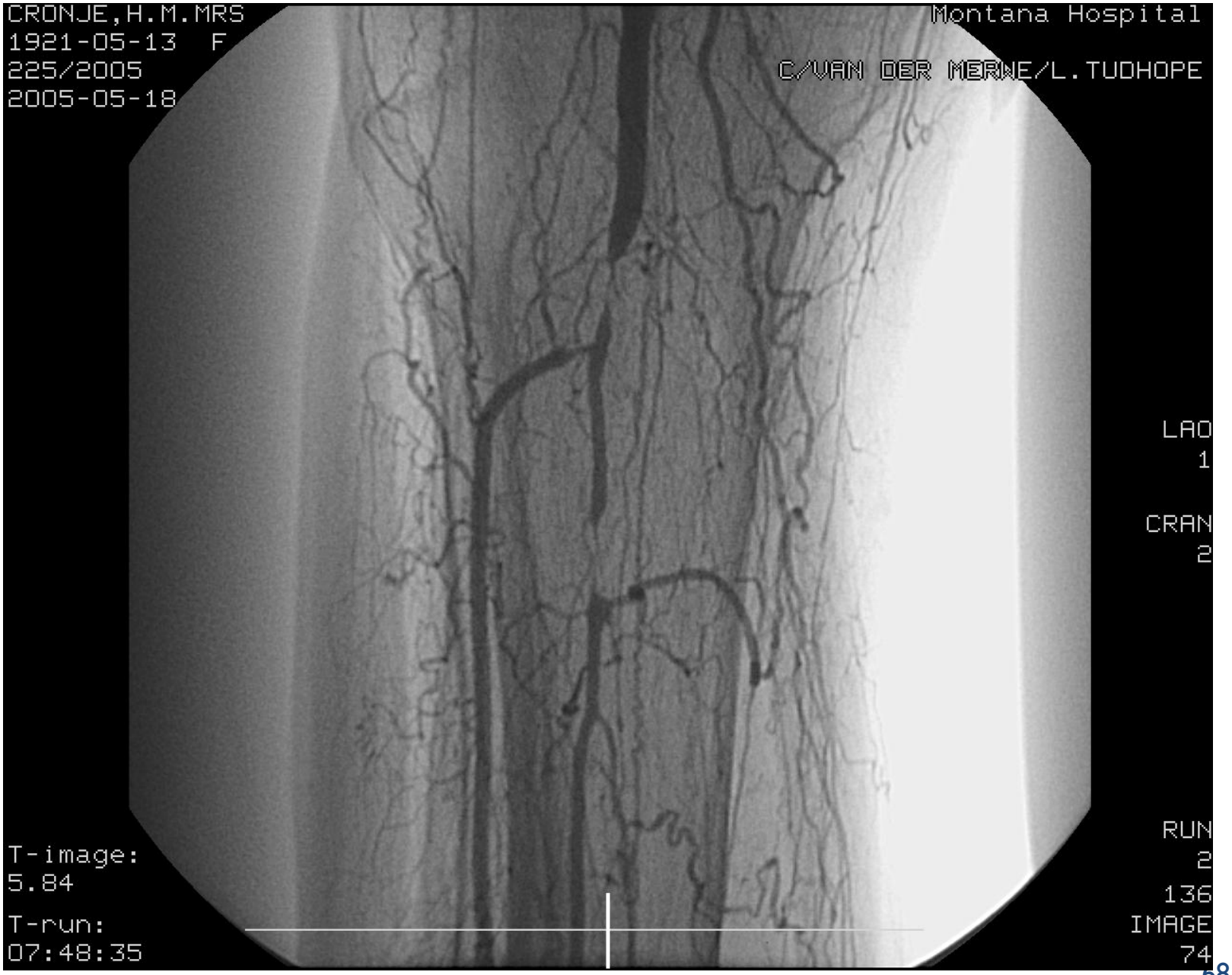
Doppler: Anterior tibial artery → dorsalis pedis

Doppler:

✓ **antegrade flow posterior tibial artery**



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2005-05-18
Montana Hospital
C/VAN DER MERWE/L.TUDHOPE
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2
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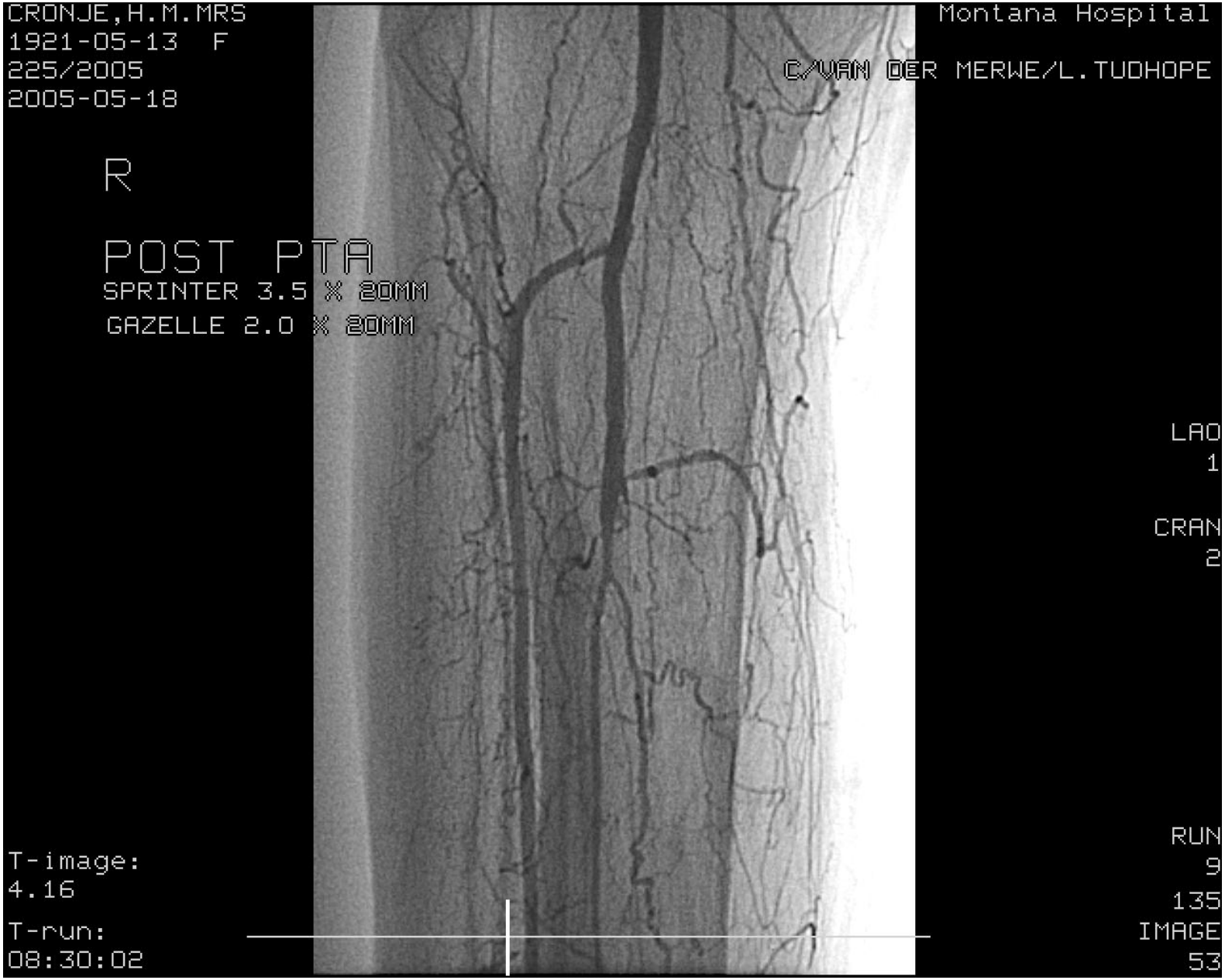
T-run:
07:48:35
RUN
2
136
IMAGE
74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2005-05-18
Montana Hospital
C/VAN DER MERWE/L.TUDHOPE
R
POST PTA
SPRINTER 3.5 X 20MM
GAZELLE 2.0 X 20MM
LAO
1
CRAN
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4.16
T-run:
08:30:02
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9
135
IMAGE
53

THE IMPORTANCE OF ANGIOSOMES IN HEALING FOOT ULCERS

- Taylor describes at least 40 angiosomes in the body, of which 5 are found in the foot and ankle.
- These originate from the three main arteries in the lower extremity, the posterior tibial artery, the anterior tibial artery and the peroneal artery.
- The posterior tibial artery supplies the sole of the foot via the calcaneal branch, the medial plantar branch and the lateral plantar branch.

THE IMPORTANCE OF ANGIOSOMES IN HEALING FOOT ULCERS

- The anterior tibial artery supplies the anterior ankle and as the dorsali pedis artery, it also supplies the dorsum of the foot.
- The peroneal artery supplies the lateral anterior upper ankle via its anterior perforating branch and also supplies the plantar heel area via a calcaneal branch.
- Arterial to arterial connections are important because, despite the occlusion of one or more arteries to the foot, these connections provide an uninterrupted blood flow to the entire foot.

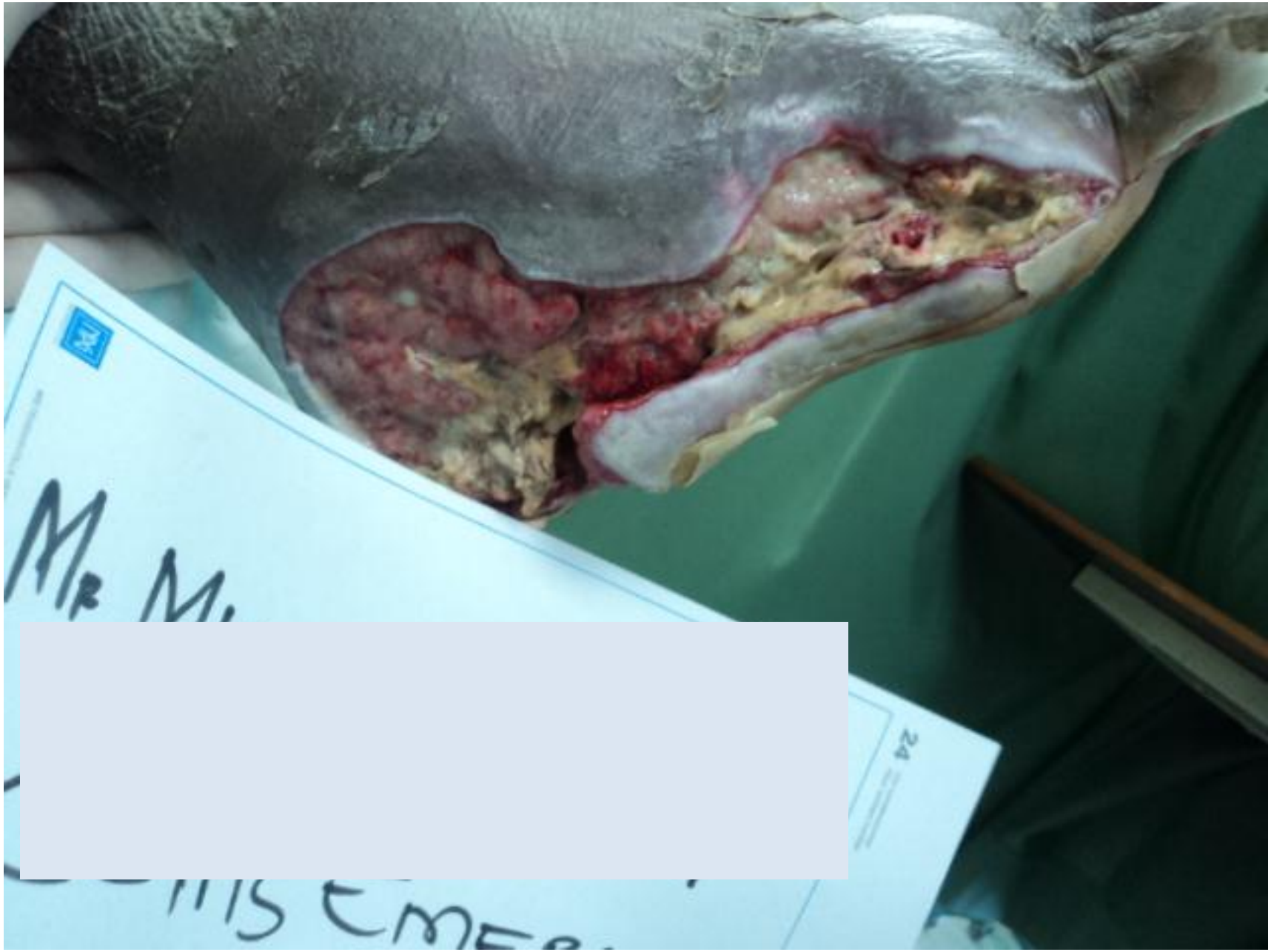
The importance of angiosomes in healing foot ulcers

- The treatment of ischemia in the diabetic foot should be aimed at the restoration of maximum blood flow to the foot with the restoration of pulsatile palpable foot pulses whenever possible
- This pulsatile flow increases the chance of wound healing and diminishes future skin breakdown and ulcer formation.
- In planning any surgical procedure on the foot, or when embarking on any course of wound care treatment, it is essential that optimum blood flow is obtained in the area of tissue breakdown.
- By understanding the principle of angiosomes and the vascular anatomy of the foot, wound healing and foot salvage will be easier to predict.

- It has been reported that up to 15% of bypasses[1] to the foot fail to heal wounds on the foot, in spite of remaining patent, simply because these bypasses failed to revascularize the affected angiosome
- It is, therefore, crucial that bypass procedures are done to the right blood vessel, if existent ischemic ulcers are to be healed.

VASCULAR SUPPLY

- Regulation of vasculature
  - Arterial supply maximization
  - Periwound edema minimization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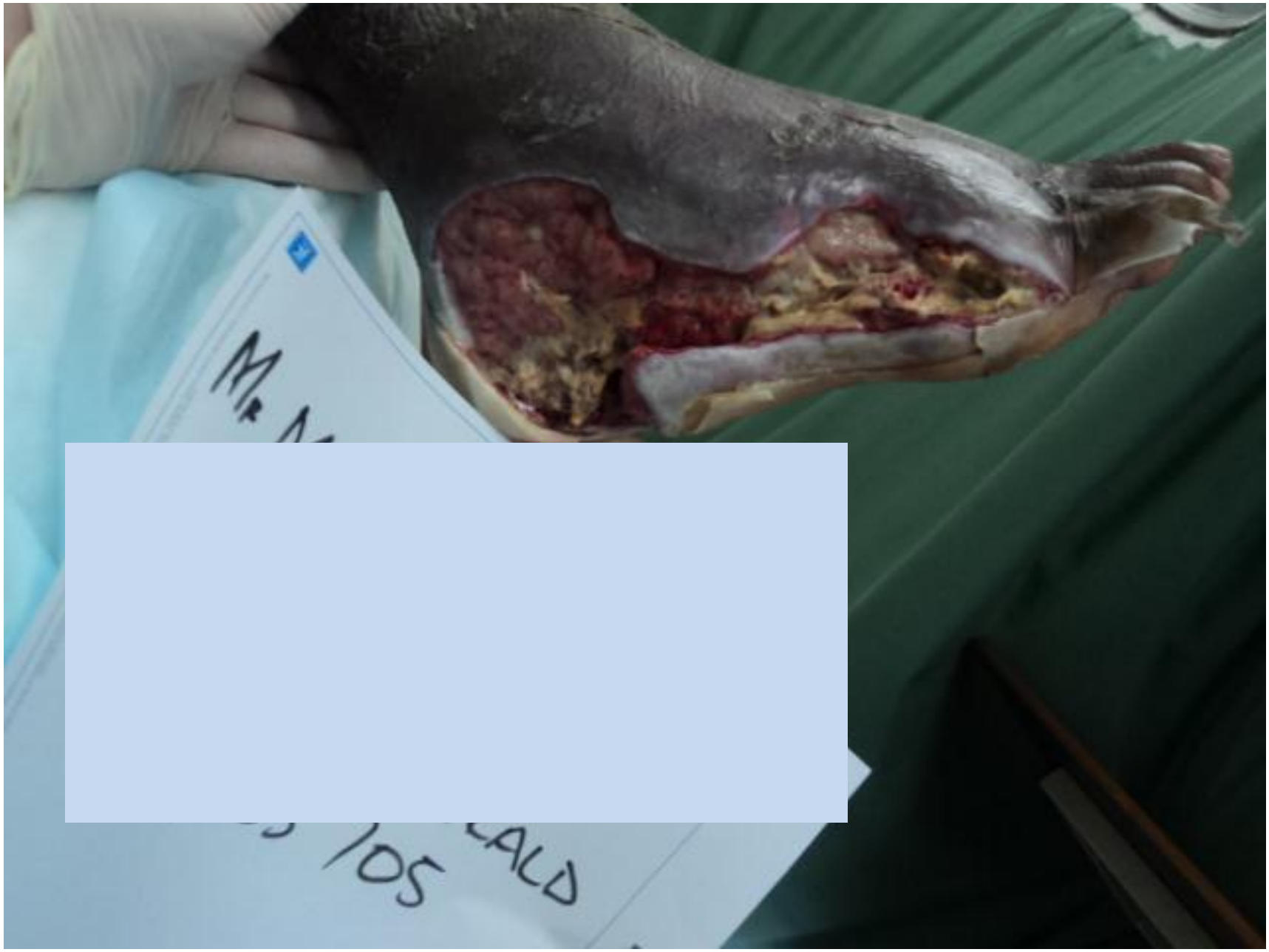

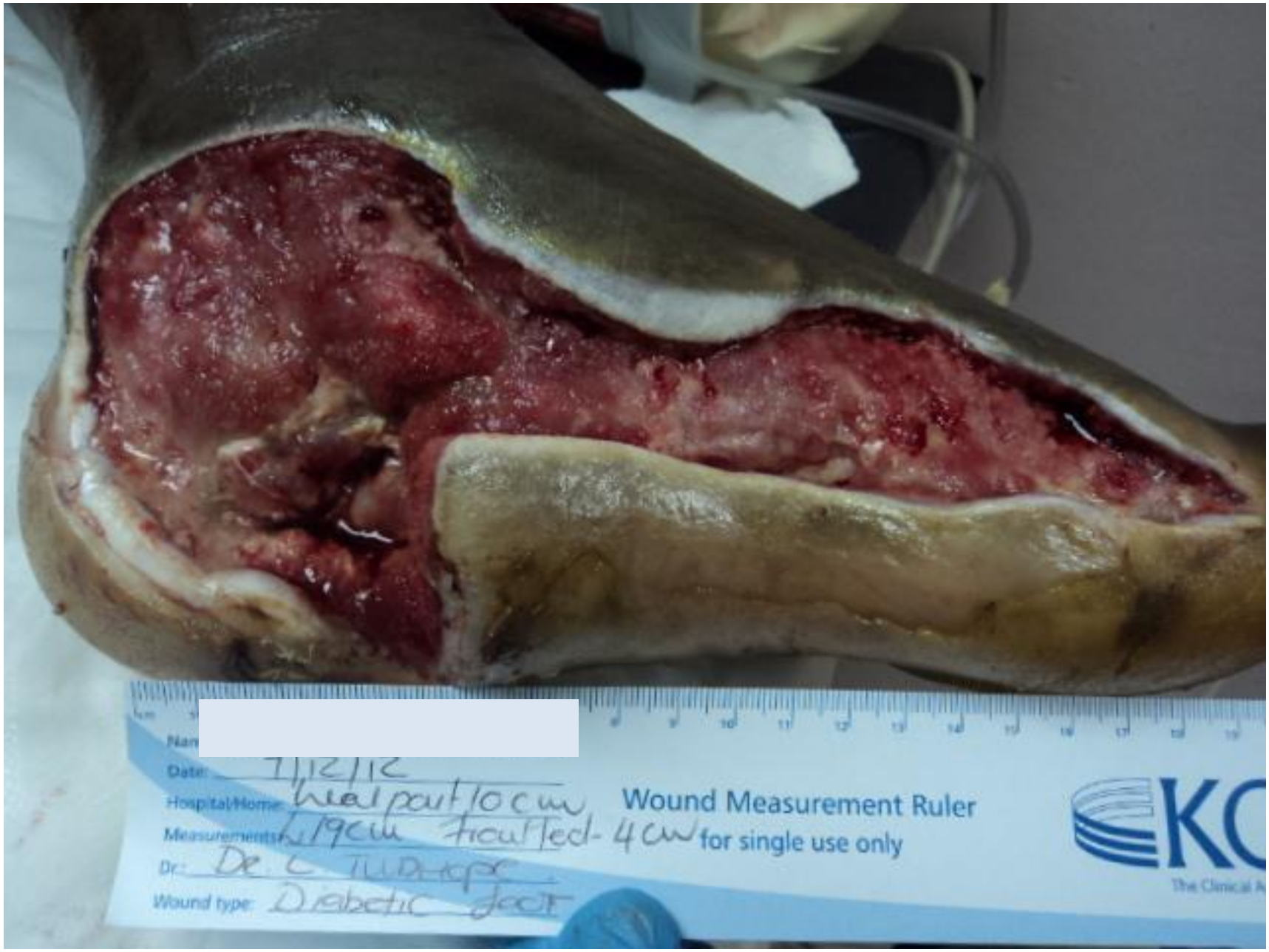
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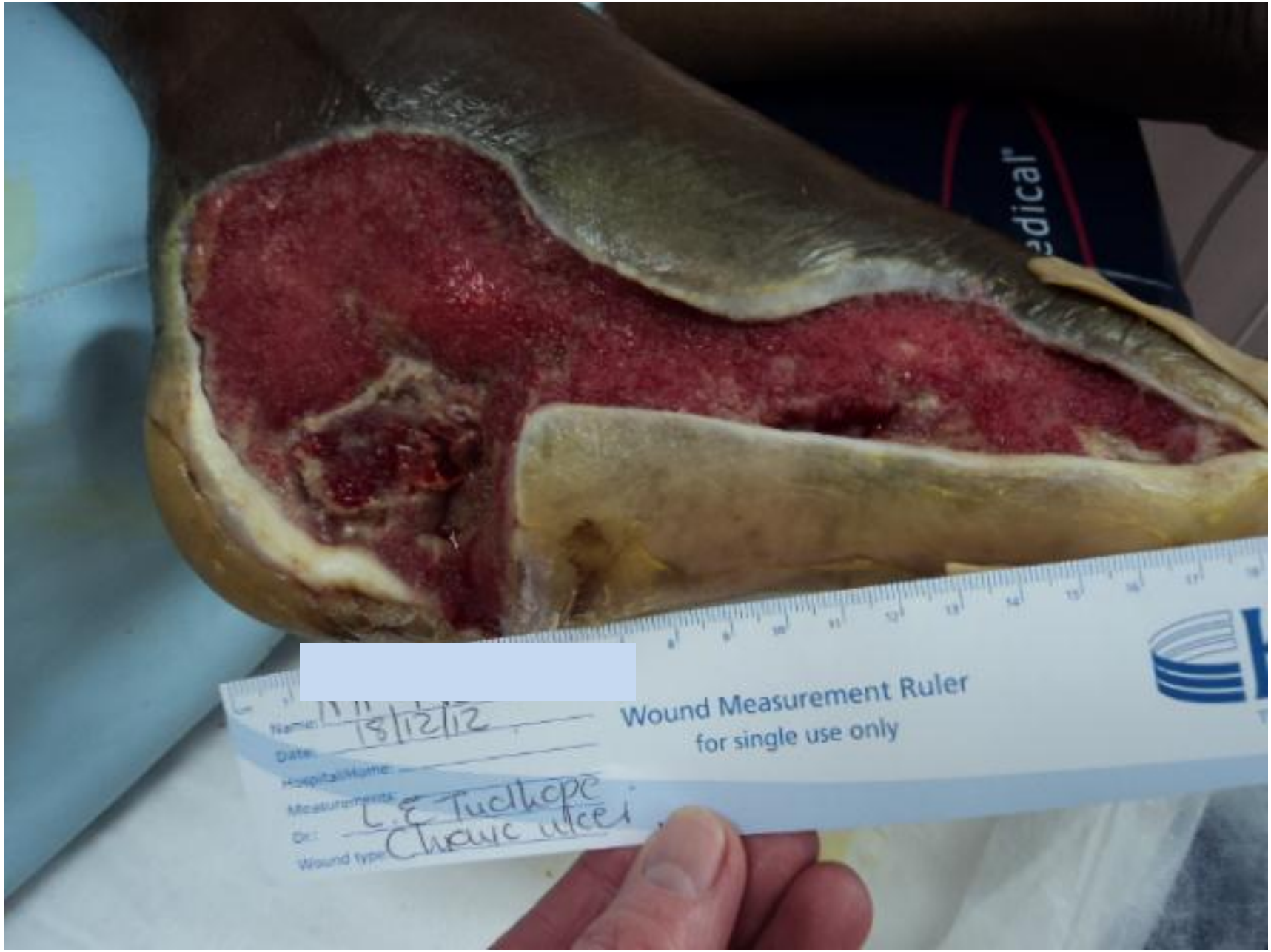
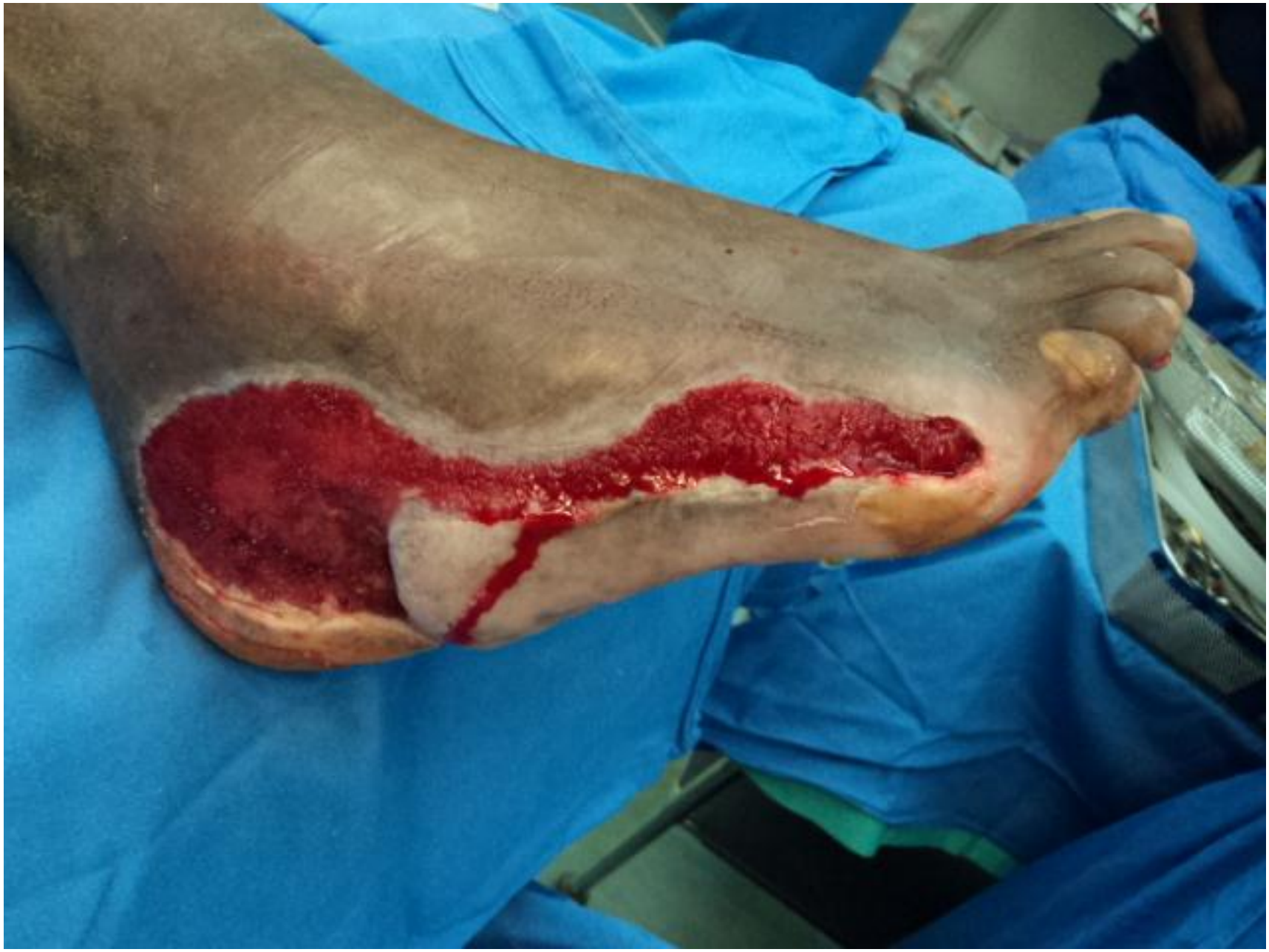
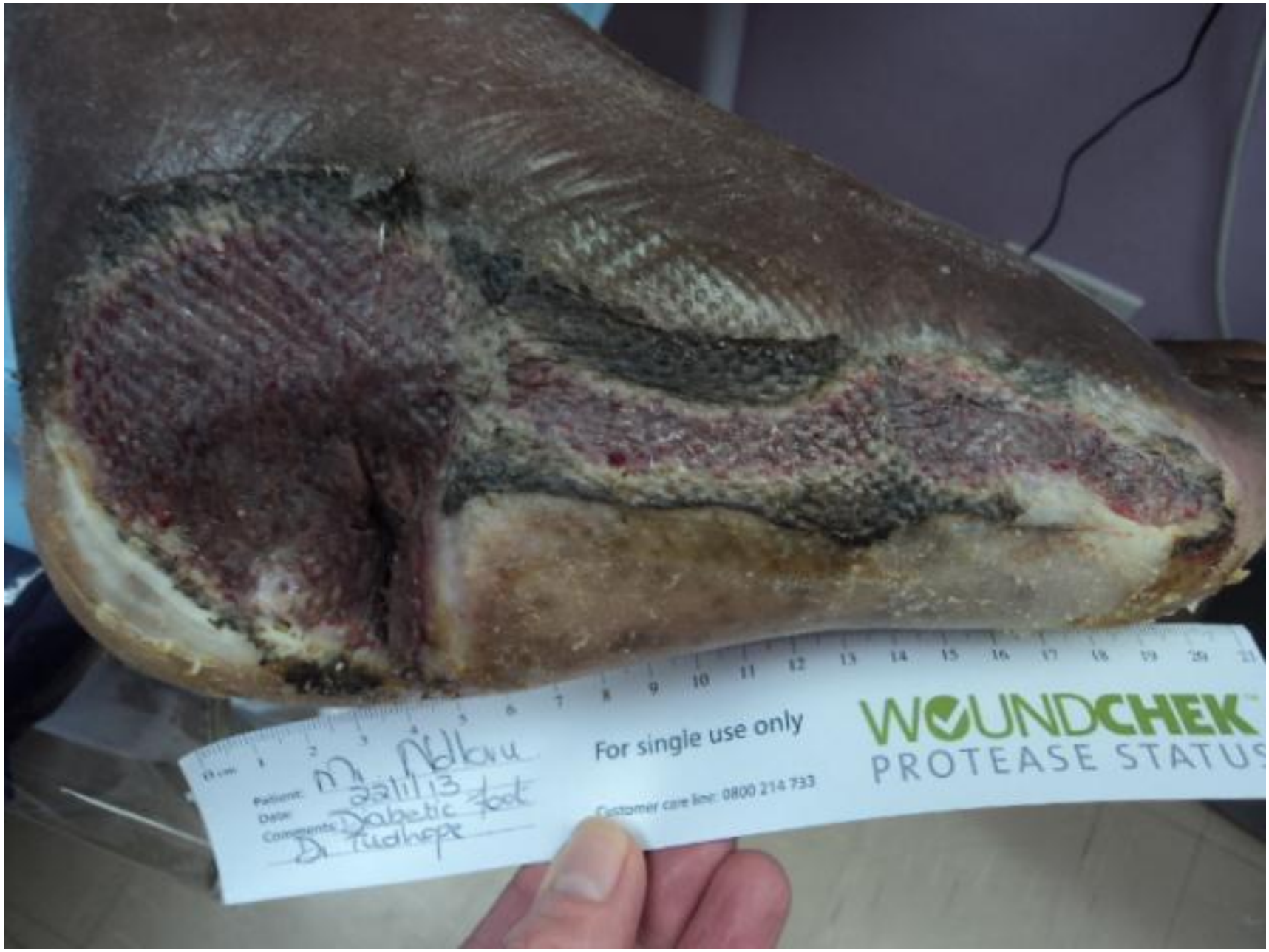
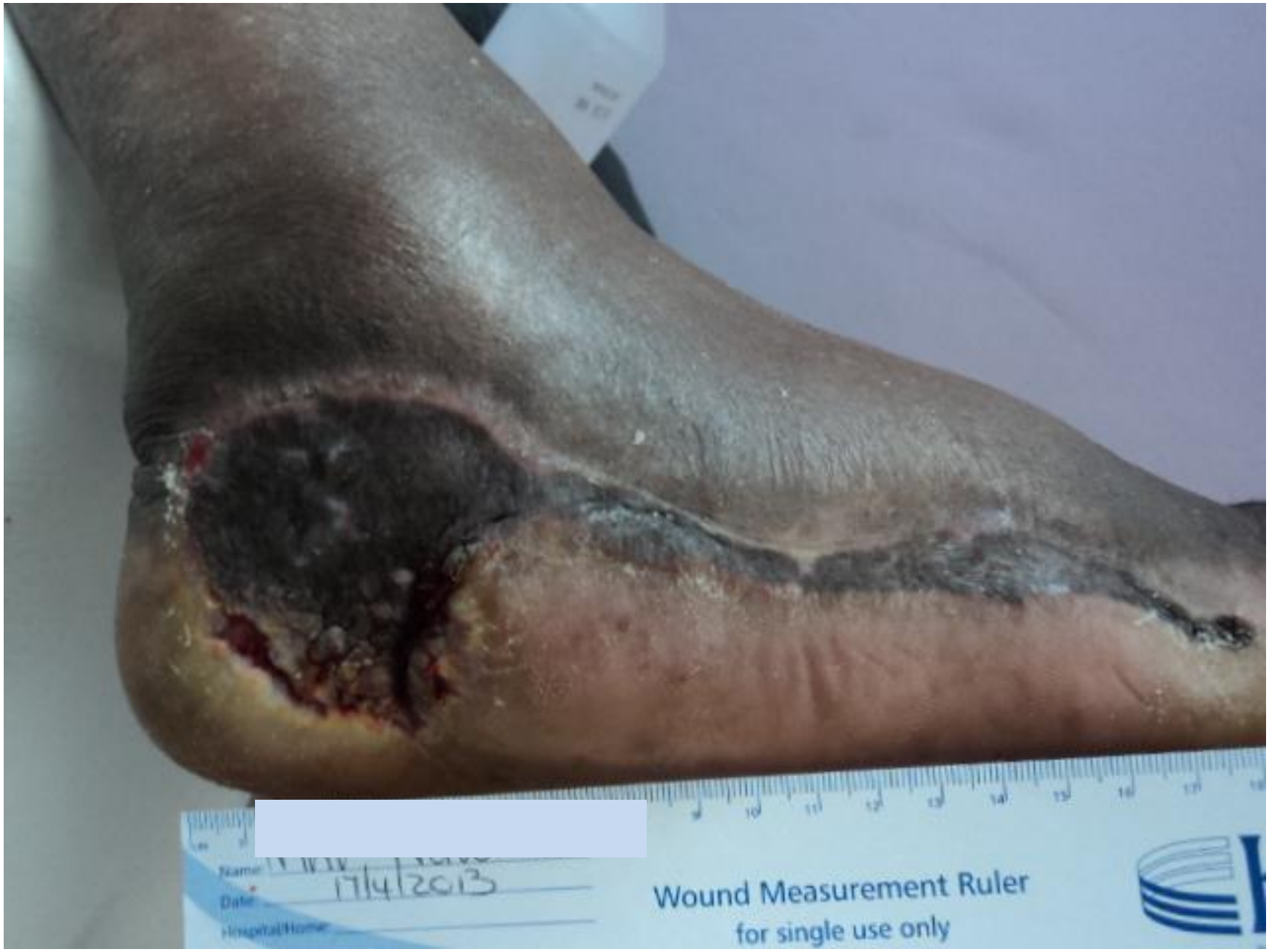
Hospital/Home:
Measurements: 1.9cm
Dr:
Wound type: Diabetic foot
Wound Measurement Ruler
for single use only


Wound Measurement Ruler
for single use only
Name:
Date: 18/12/12
Hospital/Home:
Measurements
Dr:
Wound type: Chronic ulcer



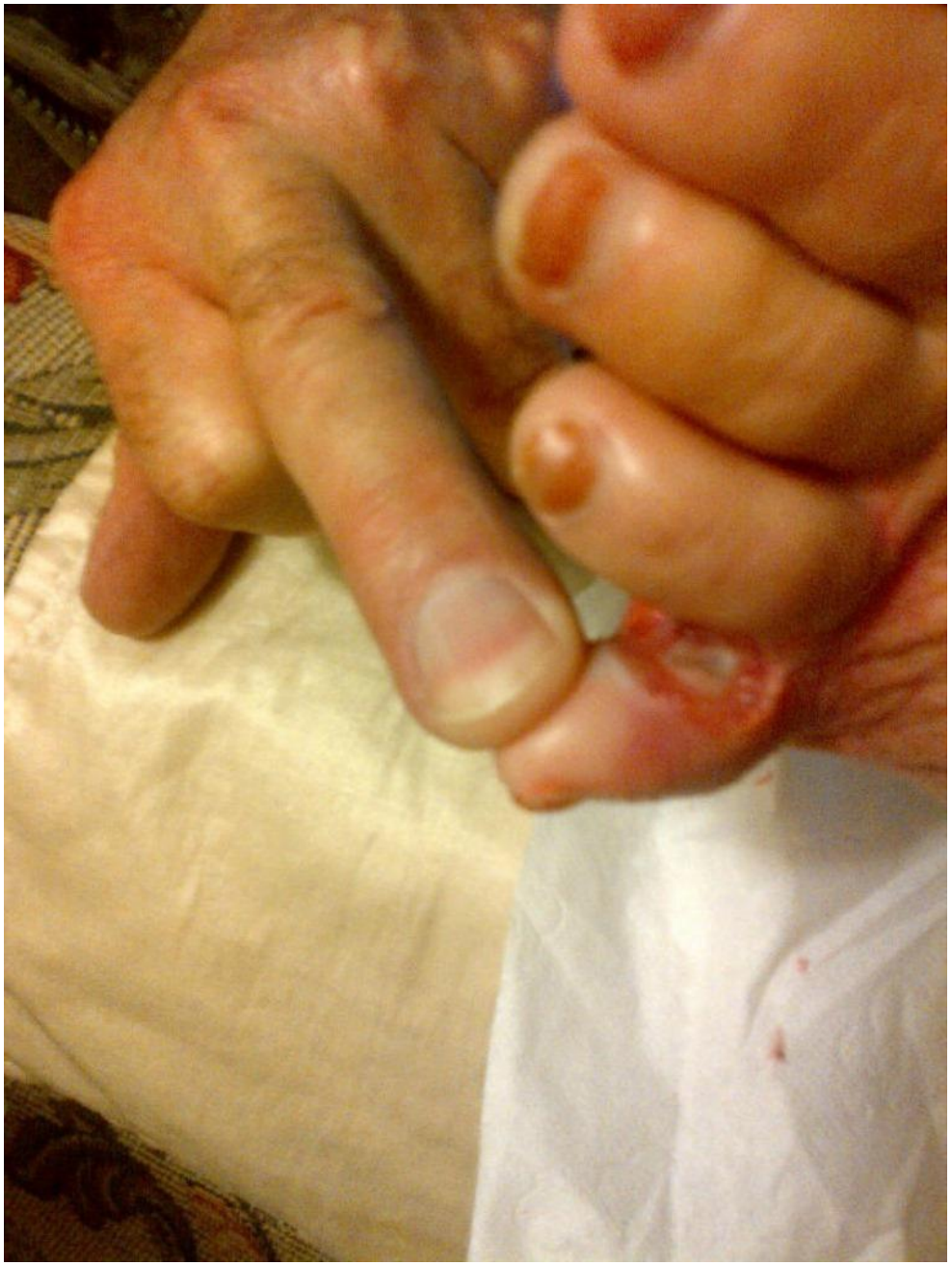

For single use only
WOUNDCHEK
PROTEASE STATUS
Customer care line: 0800 214 733
Patient:
Date:
Comments:
Diabetic foot


For single use only
0800 214 733
PROTEASE
Date:
Comments:

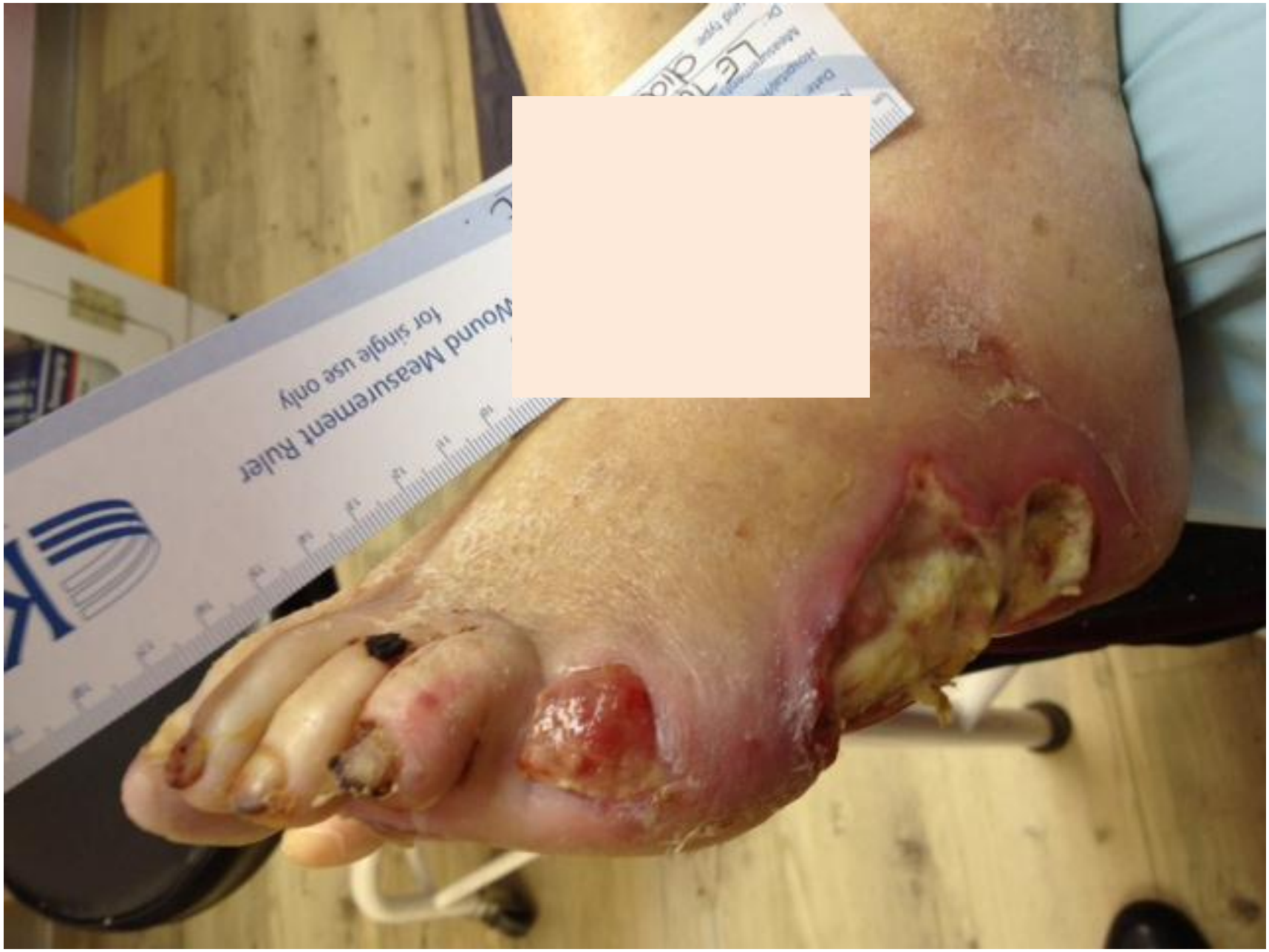

17/4/2013
Wound Measurement Ruler
for single use only

PERIPHERAL NEUROPATHY

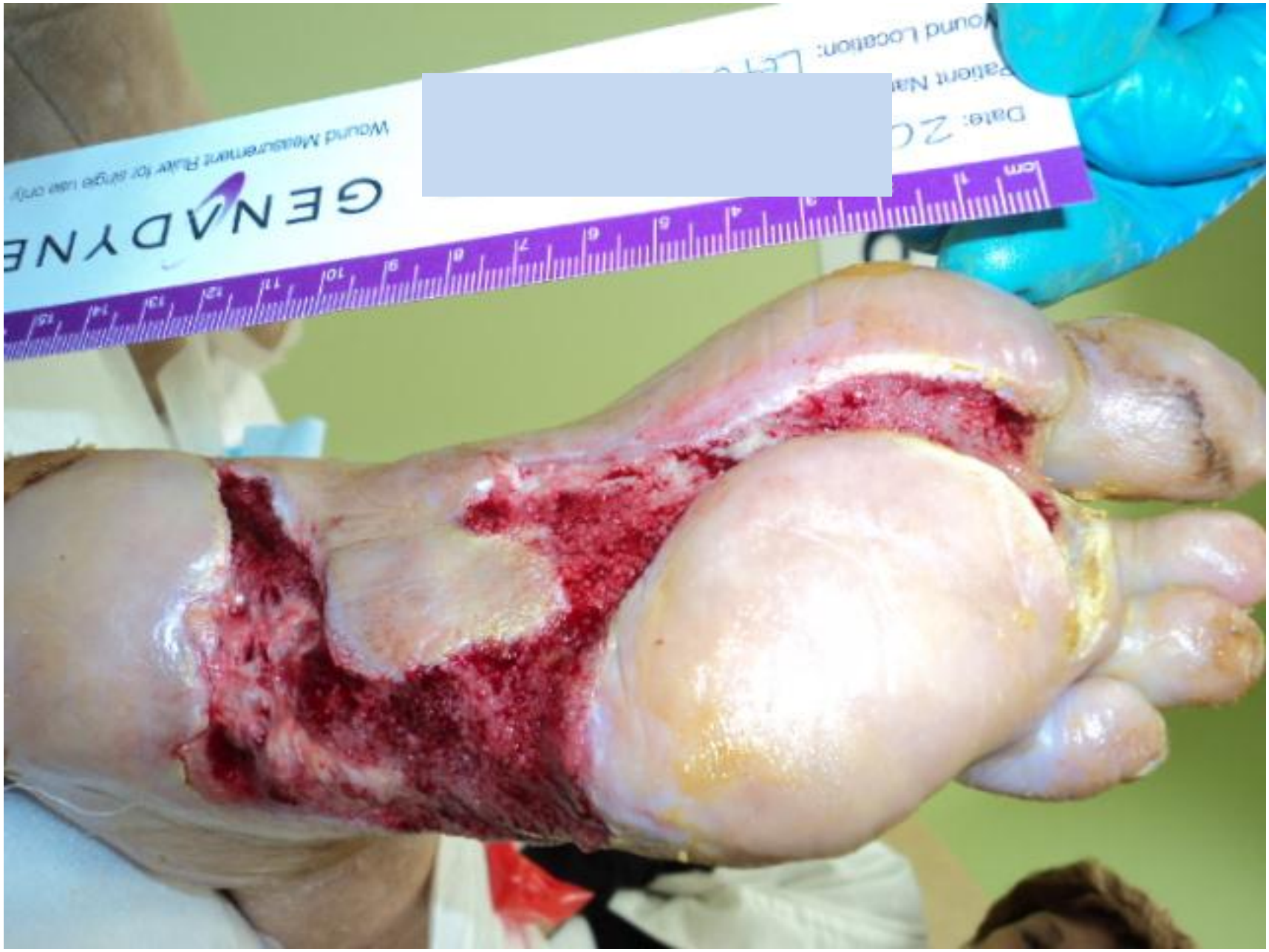
- Affects sensory, motor and autonomic innervation
- Loss of sensation – wounds go unnoticed
  - Reduction of pain and tenderness…. No early warning system
- Motor nerve damage – foot deformity, abnormal pressure points, callus, ulceration.
- Autonomic neuropathy – dry skin, heel cracks , tearing and infection



Wound Measurement Ruler
for single use only


Wound Measurement Ruler
for single use only


Name:
Date:
Measurements:
L.E Tuchqx.
Left foot.
Wound Measurement Ruler
for single use only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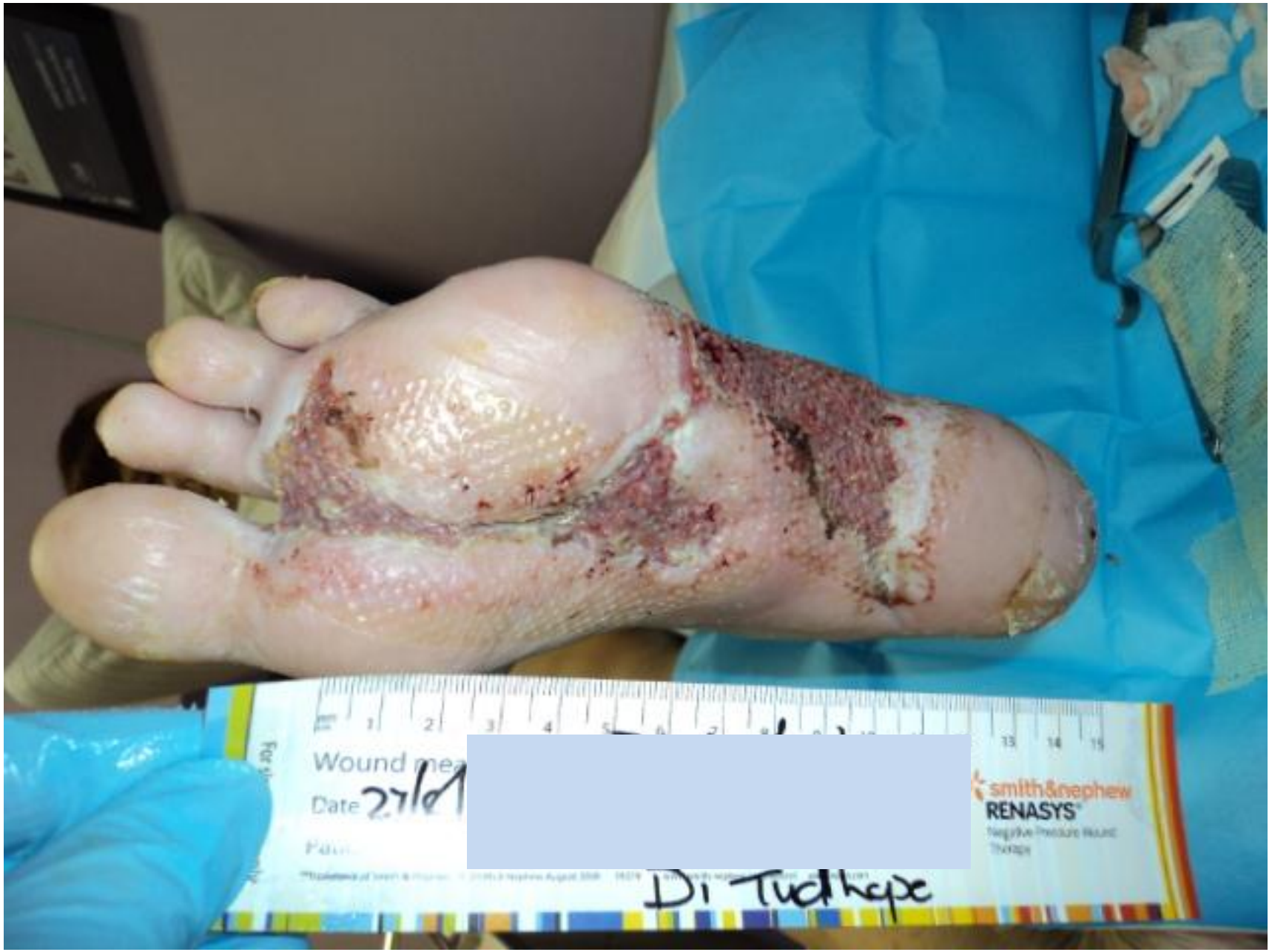
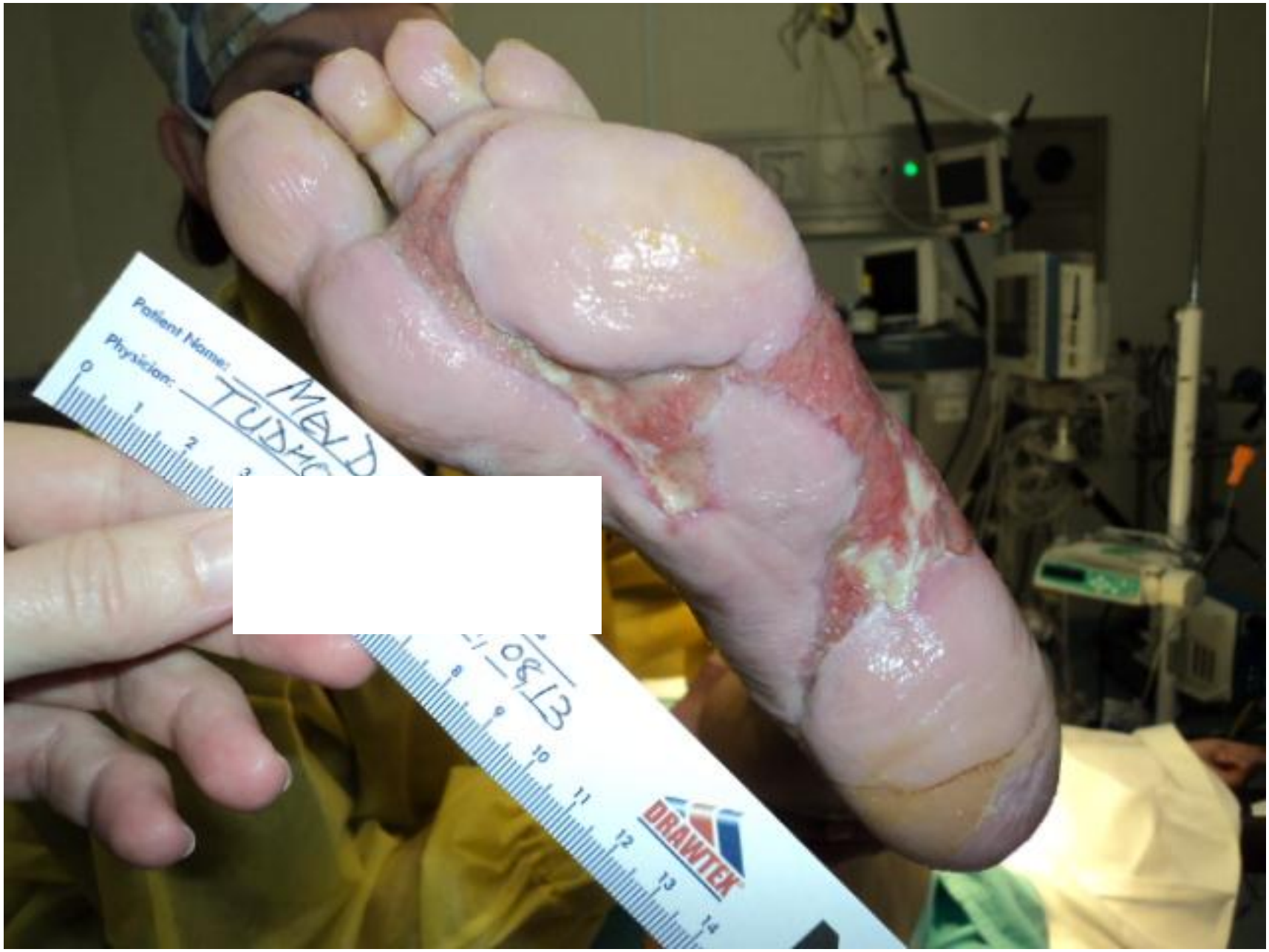

Wound
Date
smith&nephew
RENASYS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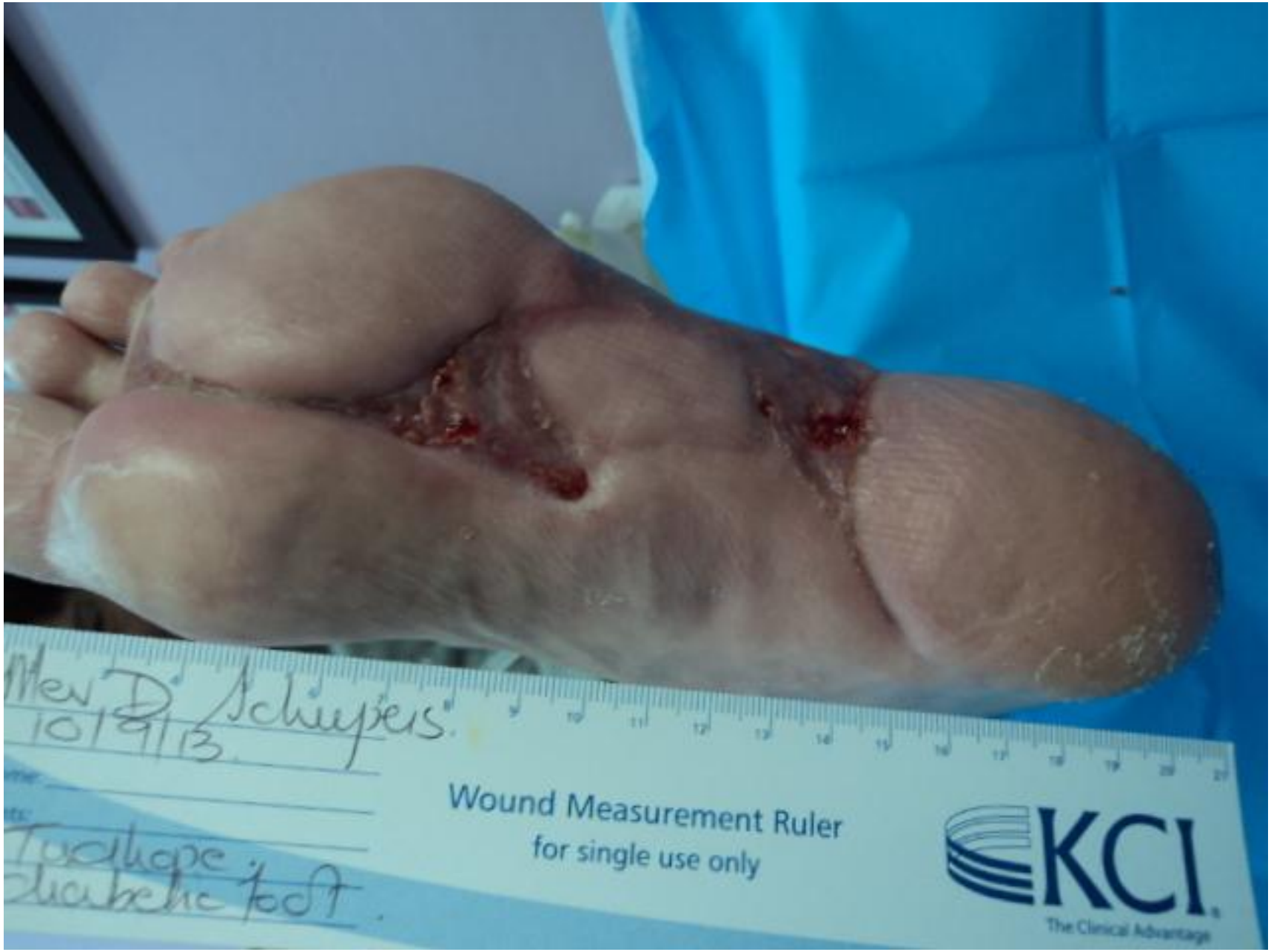
Physician:
DRAWTEX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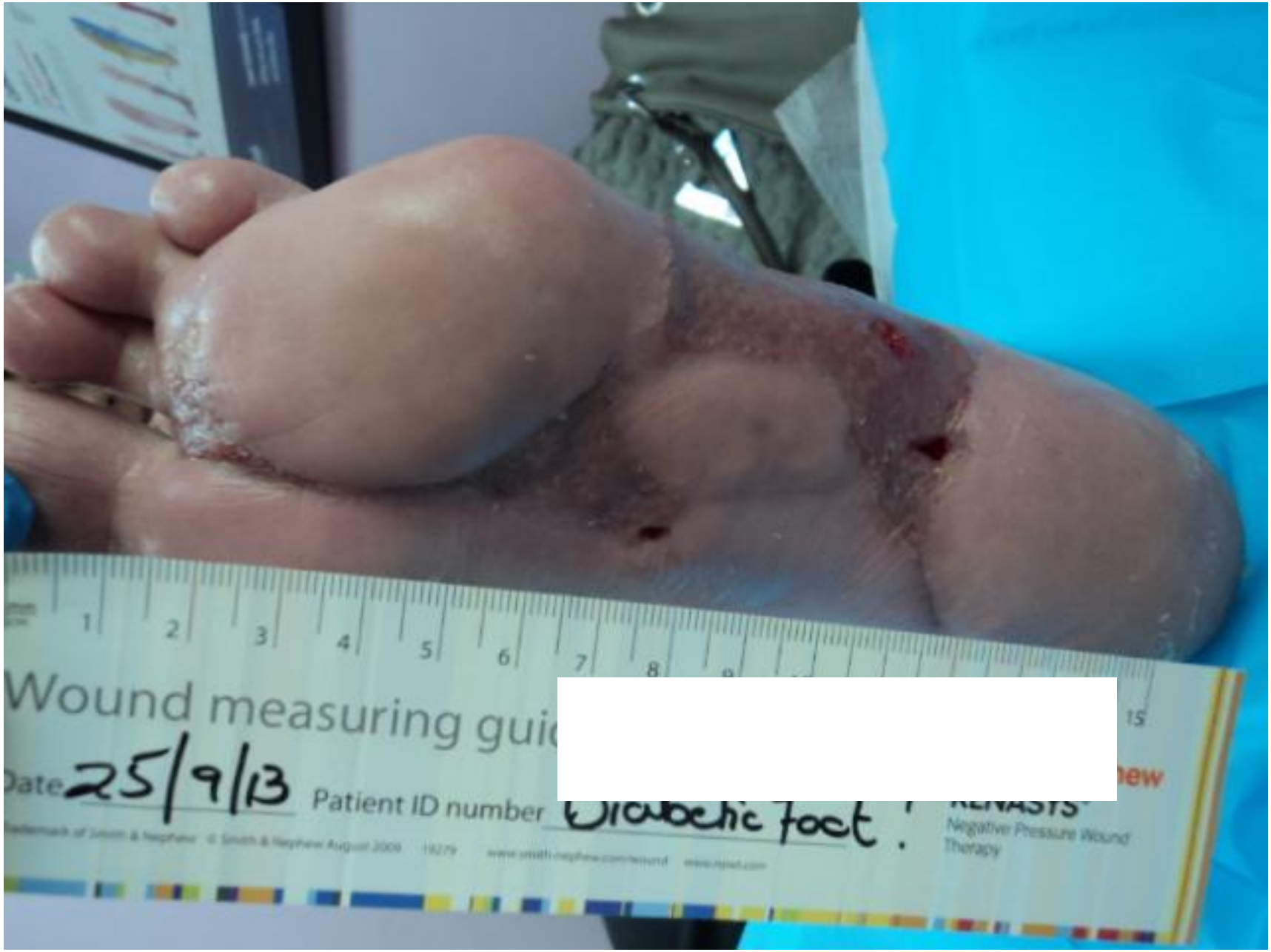
diabetic foot
Wound Measurement Ruler
for single use only
KCI
The Clinical Advantage


Wound measuring gui
Date 25/9/13
Patient ID number
Diabetic foot
Negative Pressure Wound Therapy

BARRIERS TO EFFECTIVE MANAGEMENT

- Importance of foot care not recognised
- Ignorance of improved patient outcomes with better foot care
- Non existent podiatry services
- **Team approach lacking**
- **Routine referral for amputation**
- Limited training programs for healthcare providers

BARRIERS TO EFFECTIVE MANAGEMENT

- Services run by non specialist nurses not foot care specialists
- Barefoot walking common
- Faith healers, herbalists and home therapies
- Unaffordable footwear
- Poverty; limited access to care

THE DIABETIC FOOT

- Establish contacts in healthcare
- Raise funds
- Foot clinics beginning with a diabetes centre for excellence
- Multidisciplinary educational approach
- Establish attainable goals
- Recruit , train and retain
- Motivate healthcare professionals

SERVICES NEEDED

- Foot Screening
- Nail Care
- Ulcer Care
- Debridement
- Offloading Devices
- Education

In summary

- non infected wound?
  - no antibiotics
  - specialised wound care
  - off loading
- Infected wound?
  - stage wound
  - chemical or mechanical debridement
  - tissue and/or bone biopsy
  - oral or IV antibiotics
  - off loading

THE DIABETIC FOOT: Two decades of "progress"

1986: First Malvern Diabetic Foot Meeting

1987: Foot Council of ADA formed

1991: First International Diabetic Foot Meeting

1998: Diabetic Foot Study Group of EASD founded

1999: International Consensus group publishes "Guidelines on management"

2001: Formation of DFSIs

2002: First DFCon meeting, Universal City, Los Angeles

2004: Formation of GLEPED

2005: IDF designated year of the Diabetic Foot

2007: Formation of DFWG, South Africa

2007: Fifth International Diabetic Foot meeting

2009: Opening of first foot clinic in Colombia

2010: 13th biennial Malvern Diabetic Foot meeting

2010: First Pan-African Diabetic Foot meeting, Spier

2014: 2nd Pan-African Diabetic Foot meeting, Dar es Salaam

Laughter the best medicine?

- 5 year study – Leeds School of Healthcare
  - "A hearty chuckle stimulates the diaphragm which in turn plays a vital role in moving blood around the body and speeds recovery from leg ulcers"