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Diabetic foot ulcers

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CWHC Copenhagen Wound Healing Center


Multidisciplinary Wound Healing Center

- **Surgical approach!**

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CWHC – Local operating theatre:

- Serviced by nurses from the bed unit



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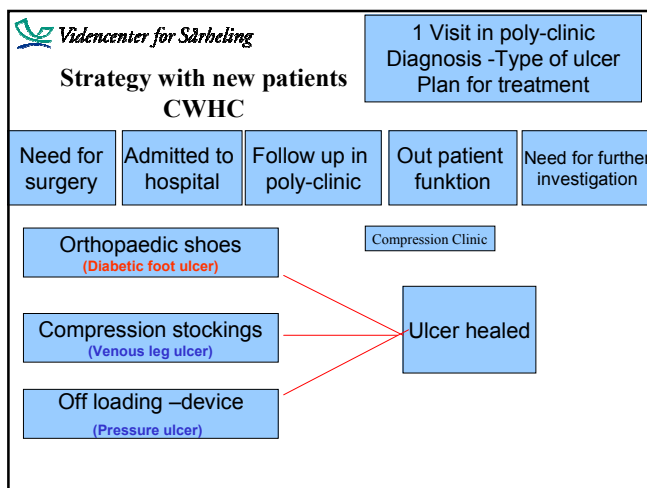
CWHC – Organisation


- Today 15 beds – full time for ulcer patients
- Daily Poly-clinic and nurse clinic (5+1 nurse)
- Out patient function with 2 nurses treating patients in their own homes.
The nurses have base in the centre and are part of the nursing staff.
- Compression clinic with 2 nurses
- Local operating room – daily
- Central operating theatre once / week
- 3 research nurses!

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CWHC – Organization Staff

- 6 doctors + Finn Gottrup
- 28 Nurses + Kirsten and Vonnice
- 5 Podiatrists
- 1 Physiotherapist
- 6 Secretary / Office staff
- 1 Research biotechnician
- Research fellows (3 research nurses)




 **Types of patients in figures**


<ul style="list-style-type: none"> • 45 % • 45 % • 10 % 	<ul style="list-style-type: none"> Leg ulcers – venous or mixed Diabetic foot ulcers Ischemic ulcers Pressure ulcers Ulcers due to vasculitis Cancer ulcers And others
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 **Wound assessments**


Diabetic foot ulcer

 **The multidisciplinary diabetic foot care team**



- diabetologist
- specialized nurse
- chiropodist
- orthopaedic surgeon
- vascular surgeon
- orthopaedic shoemaker
- orthotist
 - clinical physiology, microbiology, radiology

 **The whole patient**

- Patient centred concerns: emotional, social, and psychological (culture)
- Quality of life: reduction in social activities, limitation i mobility, negative impact on general health, tensions in the family and lost time from work

 **The whole patient**

- Glycaemic control (HbA1c < 7%)
- BMI < 30kg/ m2
- Hypertension < 140/90 mmHg
- Hyperlipidemia Cholesterol < 5,2 mmol/l
- Other complications
- Past history, medications and other
- Nutrition
- Pain

 **Remember** 


- Good communication is not what the healthcare professional said, but what the patient understood
- It is not the healthcare professionals task to take the responsibility from the patient, but to give him a choice:

The involvement of the patient as a member of the healthcare team improves patients outcomes!

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DAWN :
International project (Can be read in "Behandlerbladet", (Danish Diabetesforeningen, May 2007))

- Promote communication between patient and healthcare professionals
- Promote better cooperation in the team
- Promote self care
- Overcome barriers in use of more active treatment
- Promote access to psycho social support



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Diabetic foot ulcer patient

- Dress the wound
- Off load ulcer
- Protect the foot
- Control infection
- Increase perfusion
- Remove oedema
- Metabolic control
- Nutrition control
- Pain control

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The diabetic neuropathic foot

- 4 major pathologies united in threatening the diabetic foot
 - Neuropathy (somatic and autonomic)
 - Liability to infection
 - Occlusive arterial disease
 - Tissue pathology: collagen and bone (glycation of collagen fibres)


Highly increased risk of foot ulcer and amputation

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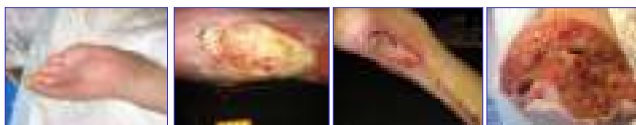
Classification of ulcers

- Neuropathic ulcers
- Neuro - ischemic ulcers
- Critical limb ischemia

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Classification of ulcers



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Wagners classification of diabetic foot ulcers


- Grade 0 (prevention)
- Grade 1.....
- Grade 1A.....
- Grade 2.....
- Grade 3.....
- Callus
- Superficial wound
- Superficial wound with infection
- Deep wound (tendon, and bone)
- Deep wound with infection (*abscess*)

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Wagners classification


- Grade 4.....
- Grade 5.....

- Necrosis locally
- Necrosis of the whole foot



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Wagner 0



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Off-loading




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Off-loading



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Prevention Off-load !!!!!



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Off-loading in different sizes



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Prevention is very important!

- "49-85 % of all problems diabetic foot related problems are preventable!"




Karel Bakker et al., 2005

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Prevention


- Education of patients, carers and healthcare providers is essential!
- More RCT are required to obtain more evidence



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Prevention


- Valk GD, Kriegsman DMW, Assendelft WJJ
- Patient education for preventing diabetic foot ulceration
- **Cochrane Review**
<http://www.update>



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Prevention Guidelines

- Assessment and Management of foot Ulcers for people with diabetes. Nursing best practice Guidelines, Shaping the future of Nursing, March 2005



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Prevention Guidelines




- Type 2 diabetes, prevention and management of foot problems, Update of the clinical guidelines and evidence review for type 2 diabetes;

Prevention and management of foot problems, published by the Royal College of General Practitioners in 2000. Clinical Guideline 10, January 2004, developed by the national collaborating centre for primary care.

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Guidelines prevention and treatment

- International Working Group on the Diabetic Foot, International Consensus on the Diabetic foot, 1999, 2003, 2007
- Guidelines
www.idf.org
www.iwgdf.org
www.dfsq.org




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Wagner 0 becomes 1




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Wagner 0 - 1




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Callus and diabetic ulcers




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Callus and diabetic ulcers



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Wagner 1



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Wound cleansing


- Fernandez, R. Griffiths, R. Ussia, C. (2003). Effectiveness of solutions, techniques and pressure in wound cleansing. Cochrane Database of Systematic Reviews, Issue 4.
- www.thecochranelibrary.com



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Wound cleansing


- Fernandez, R. Griffiths, R. Ussia, C. (2003). Effectiveness of solutions, techniques and pressure in wound cleansing. Joanna Briggs Institute for Evidence based Nursing and Midwifery, Vol.7, Issue 1.



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Wound cleansing


- Fernandez, R. Griffiths, R. Ussia, C. (2006). The effectiveness of solutions, techniques and pressure in wound cleansing. Joanna Briggs Institute for Evidence based Nursing and Midwifery, Vol.10, Issue 2.



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Wound cleansing

- No specific literature on wound cleansing of diabetic footulcers
- Articles related to acute or cronic wounds (updated 2006): Limited research on the theme.
- Tapwater of good quality is recommended (to leasons and postoperative wounds on adult people). Tapwater should run 1min. before use.



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Wagner 1 A



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Wound debridement


- Bradley, M. Cullum, N. Sheldon, T. (1999). Debridement of chronic wounds; a systematic review. Health Technology and Assessment, Vol. 3, 17, part 1 (DARE).

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Debridement


- Smith, J. (2002). *Debridement of diabetic foot ulcers*. Cochrane Database of Systematic Reviews, Issue 4.
- www.thecochranelibrary.com



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Debridement


- Debridement is not compared with non-debridement.
- Hydrogel is more effective than dry gauze kompres



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Compression therapy

- The patient population is people with venous ulcers
- ABI 0,9-1.




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Wagner 2



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Wagner 2 A



Infection and yellow necrosis and probe to bone

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Wagner 2 A Infection



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Wagner 2 A Infektion



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Consensus document Infection

- EWMA Position Document. Identifying criteria for wound infection, Medical Education Partnership LTD, 2005.
- www.ewma.org




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Wound bed preparation

Time introduceres:

- T = Tissue
- I = Infection
- M = Moisture imbalance
- E = Edge



Wound bed preparation for diabetic foot ulcers

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Wagner 3




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Wagner 3



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Wagner 3 before treatment




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Wagner 3



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**Diabetic foot – severe infection –
plantar abscess – surgical treatment**



Performed in local anesthesia - one hour after the patient was seen in the poly-clinic


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Wagner 4



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Wagner 4



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Wagner 5




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Wagner 5



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5-600 Danish diabetics are amputated every year (crus or femur)



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Which dressing ?

- More than 3000 types of dressings in Europe.
- **Improvement or ?**

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Local debridement


- Vermeulen, H. Van Hattem, J.M. Storm-Versloot, M.N. Ubbink, D.T.(2007). Topical silver for treating infected wounds. Cochrane database of Systematic Reviews, Issue 1.
- www.thecochranelibrary.com



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Local debridement


- Bergin, S.M. Wright, P. (2006). Silver based wound dressings and topical agents for treating *diabetic foot ulcers*. Cochrane Database of Systematic Reviews, Issue 1.
- www.thecochranelibrary.com



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Local debridement


- Mason, J. O’Keeffe, C. Hutchinson, A. McIntosh, A. Booth, A. (1999). A systematic review of *foot ulcer patients with type 2 diabetes mellitus* – II: treatment.



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Local debridement


- O’Meara, S. Cullum, N. Majid, M. Sheldon, T. (2000). Systematic reviews of wound care management: (3) antimicrobial agents for chronic wounds, (4) *diabetic foot ulceration*. Health Technology Assessment, Vol.4, (21) DAR



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Local debridement

- No RCT/ clinical studies are good enough
- More than 3000 dressings !!!!!
- Les than 20 clinical randomized controlled trials !!!!
- Therefore **No Evidence** that ”Modern bandages” are better than others.



Evidence ?

- Randomized controlled trials are time consuming
- (Positive) results must be repeated 3 to 5 times before convincing evidence.
- Efforts used better in other matters
- Conclusion: Large scale evidence (RCT) is not to be expected.

How to chose?

- Look at the wound
- Which wound healing fase?
Inflammation-, proliferation-, maturationfase
- Debridement
- Control exudates
- Control microbiology

Dress the wound

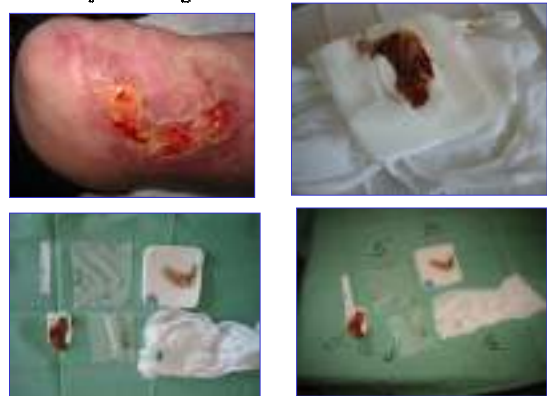
- Essential component of diabetic ulcer treatment
 - Debridement
 - Control exudate MOISTURE BALANCE
 - Bacterial control

Dry gauze ?????

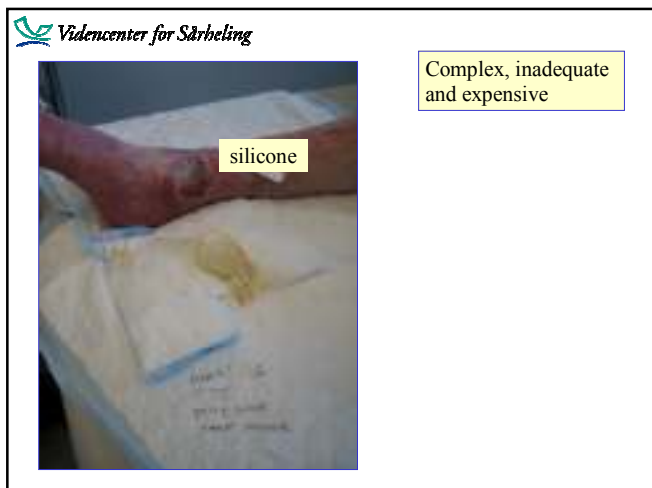
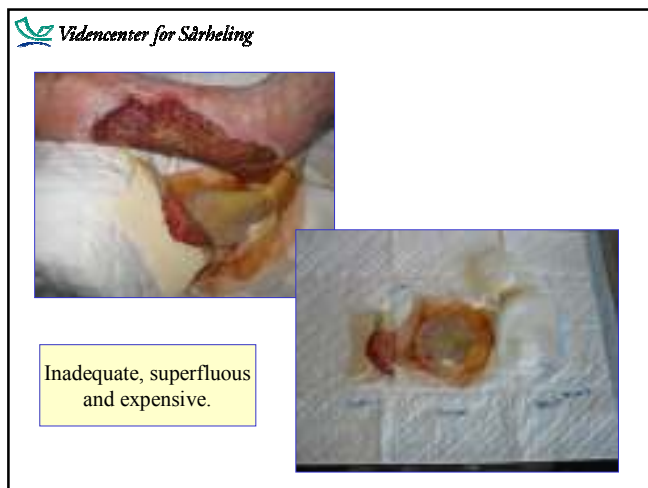
- Why not ?
- Moist environment preferable -----
-----as evidenced from acute wounds !
- But exudates makes it wet
- How wet?????????????????????????????

History

- Dry gauze packing proven inferior to "modern" dressings (1975)
 - Change of dry dressing impregnated with *dried out exudates* causes pains and new trauma.
 - Increase time in hospital
 - Delay wound healing
 - Fibres may be "buried" in granulation tissue
 - Less cost effective



Expensive superfluous combination: 23 1/2 Euro



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What can we use?

- Hydrogel
- Alginate, hydrofiber
- Foam
- Other

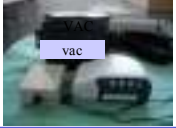
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V.A.C: Vacuum Assisted Closure (TNP)

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VAC / TNP


- Topical negative pressure for treating chronic wounds, Evans D, Land L,
- Cochrane Review 2007, Issue 1
- www.thecochranelibrary.com



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VAC


- Negative pressure wound therapy after partial diabetic foot amputation: a multi centre, randomised controlled trial
- David G Armstrong, Lawrence A Lavery, for the diabetic Foot Study Consortium
- Lancet 2005;366:1704-10
- custserv@lancet.com



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VAC

- Consensus statement on Negative Pressure Wound Therapy (V.A.C therapy) for the management of Diabetic foot wounds (2005). A compendium of Clinical Research and Practice, suppl. June 25.




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Maggots – wound debridement



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Maggot (4 treatments)



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Maggots in bags



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Transplant, quick wound healing



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Strategy venous leg ulcers and surgery



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Thank you

