Malnutritie bij diabetische voet

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Diabetes

Offloading

Vaatlijden

Infectie

Diabetes

Nierinsufficiëntie

Malnutritie

Compliance? HbA1c?

Obesitas? Roken?
Hypertensie? …?

…?

Verminderd gevoel

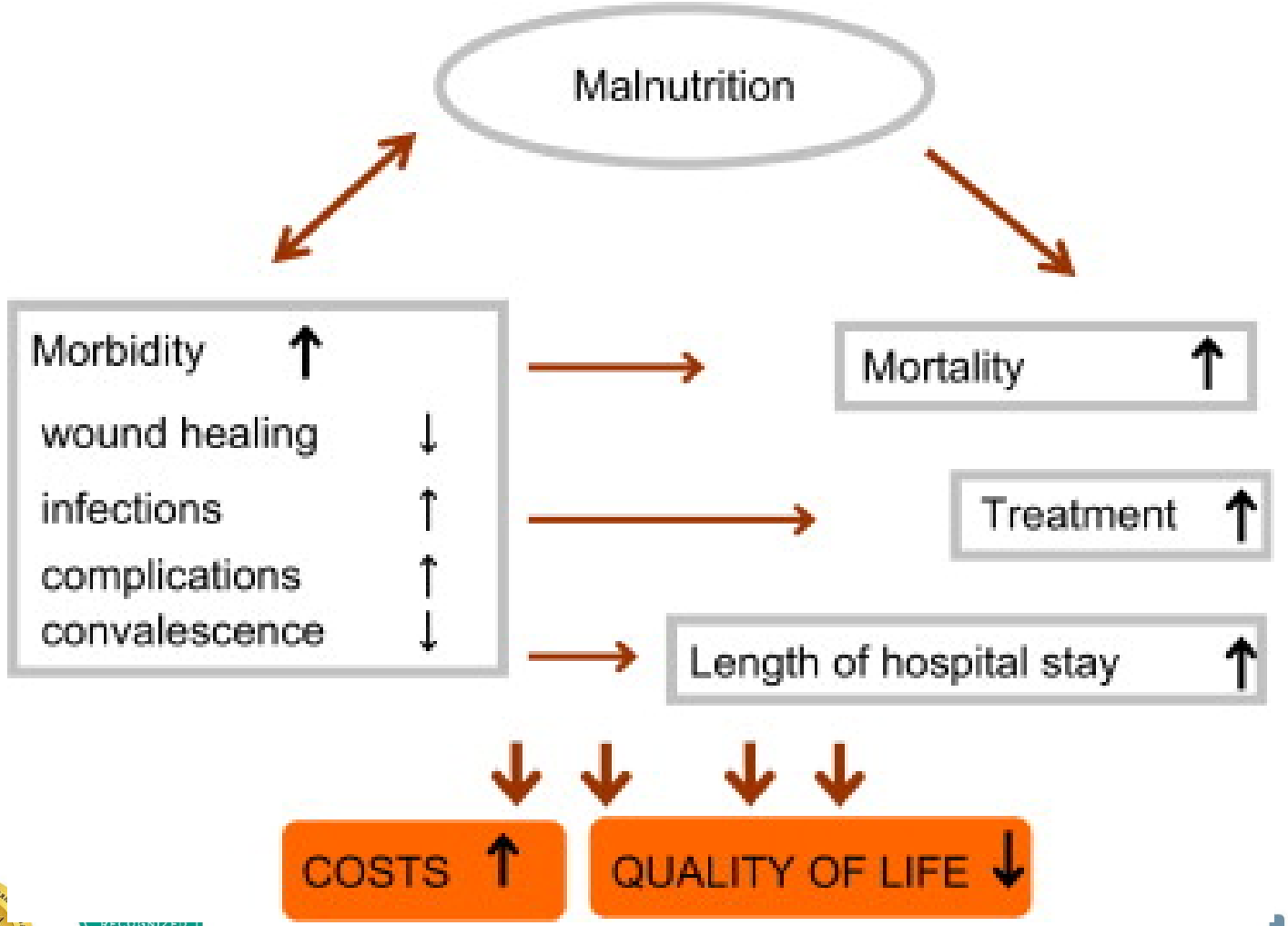
Veranderde statiek

Kwaliteit van de huid

Perifeer vaatlijden

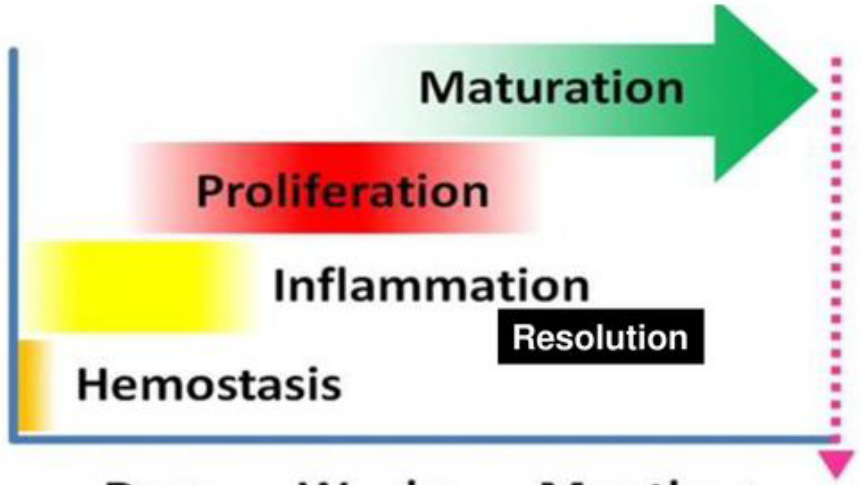
Vatbaar voor infecties

Gevolgen van ondervoeding



Gevolgen van ondervoeding op wondheling

Wound Healing



Malnutrition
- Poor protein reserves
- Less energy supply
- Fat > higher inflammatory state

Poor intake
- Poor nutrient supply
- Poor quality of wound healing
- Other complications like dehiscence, ulcers, fistulas

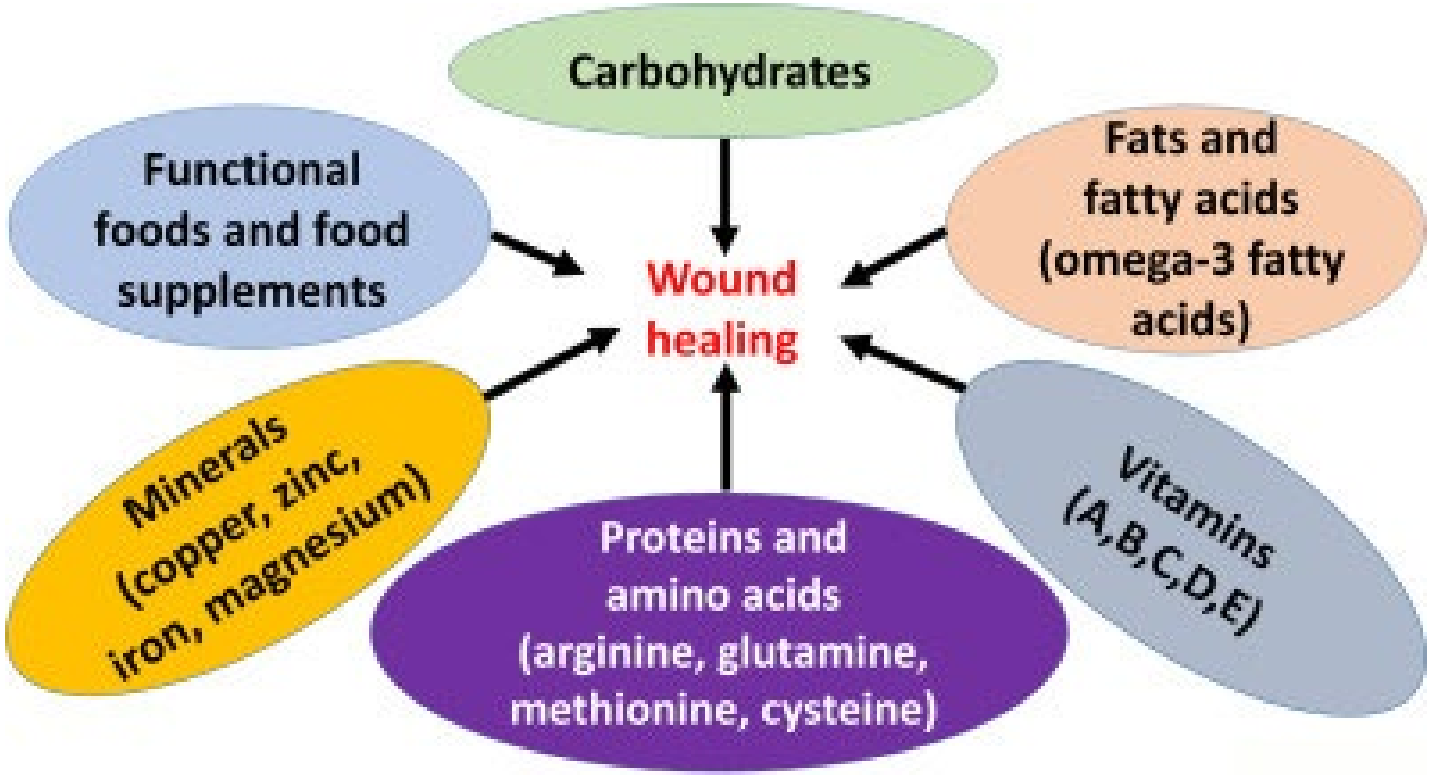
- Neutrophils
- Macrophages > active resolution

- Collagen
- Basement membrane
- Angiogenesis

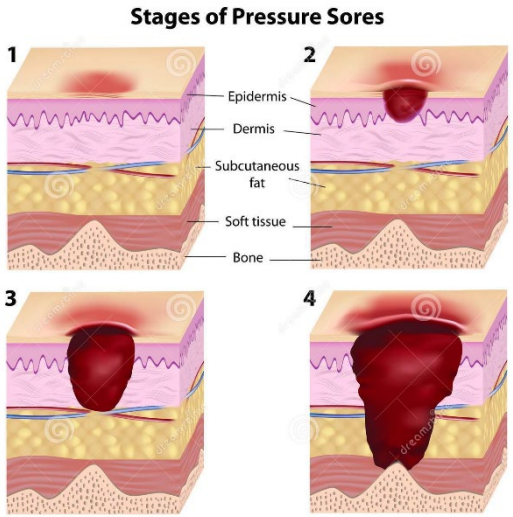
RESOLUTION PROCESS

- Success > good wound healing
- Failure > poor healing / sepsis

Gevolgen van ondervoeding op wondheling

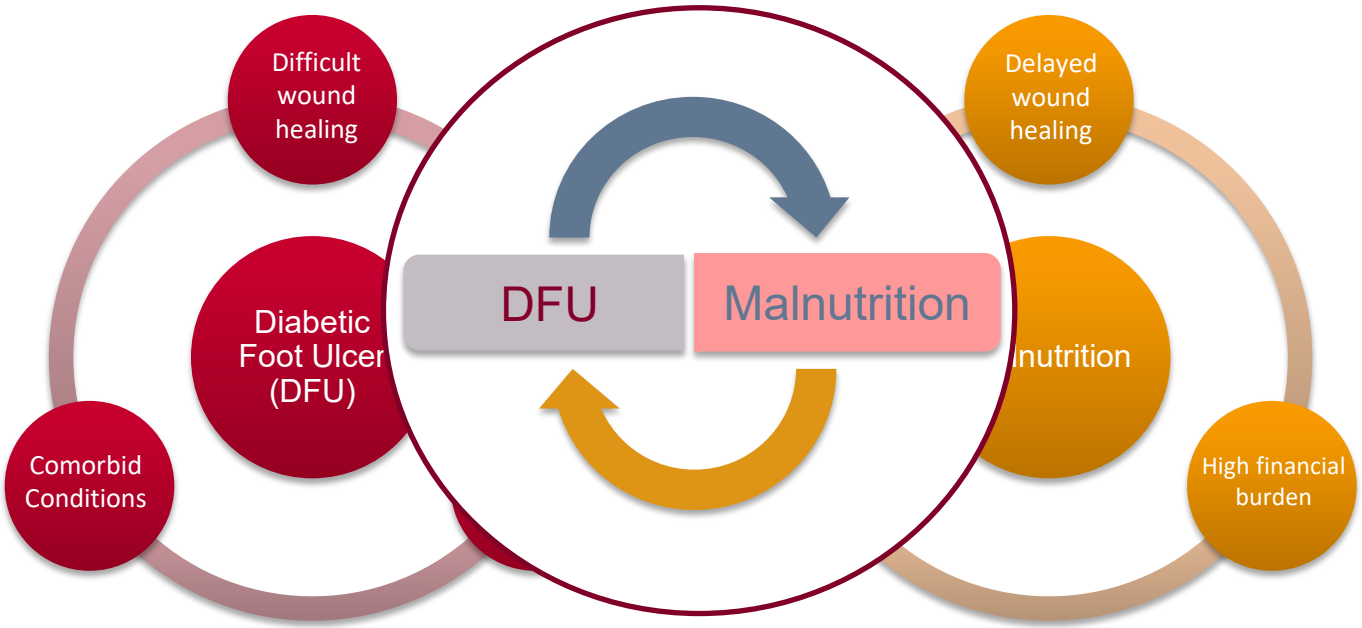


Malnutritie en chronische wondes



- The negative influence of malnutrition on wound healing has been demonstrated in various types of chronic wounds, such as pressure ulcers, venous ulcers, and burns.
- In general, these adverse effects correlate with the degree of malnutrition.

Doelstelling onderzoek



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Nutritional status deteriorates as the severity of diabetic foot ulcers increases and independently associates with prognosis

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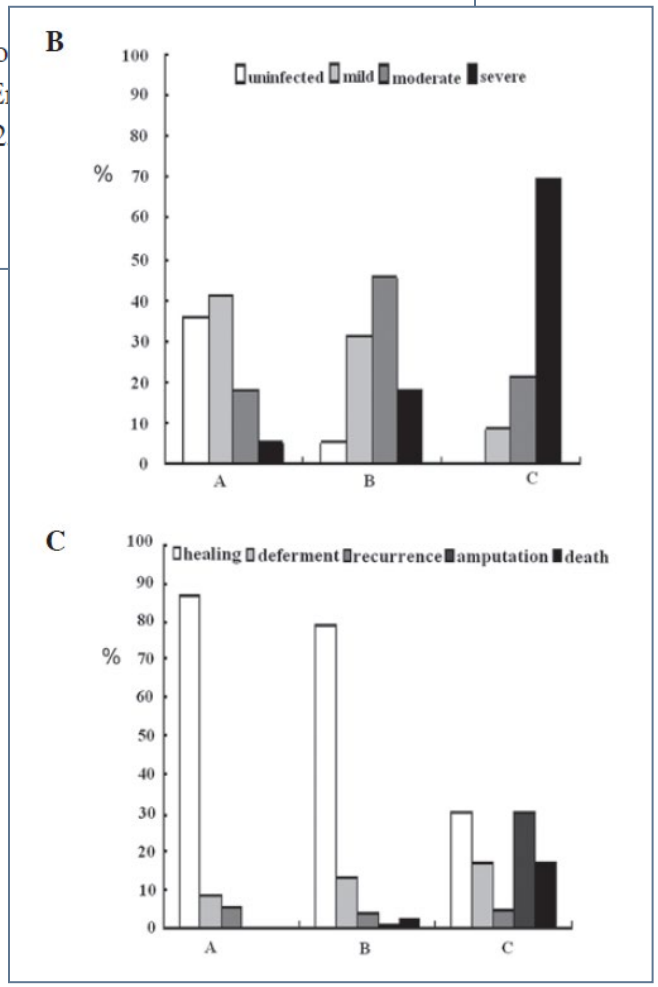


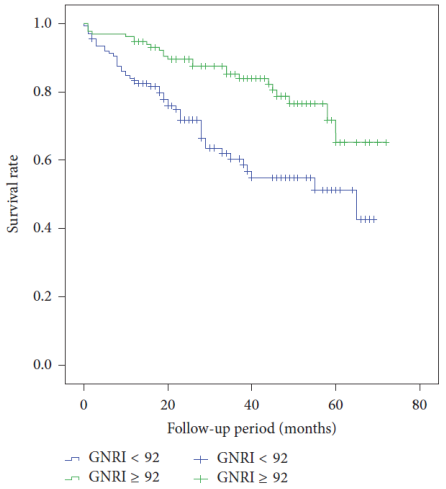
N=192 (62% ondervoed)

Malnutritie ≈ ernst wonde
≈ ernst infectie
≈ outcome

Azië

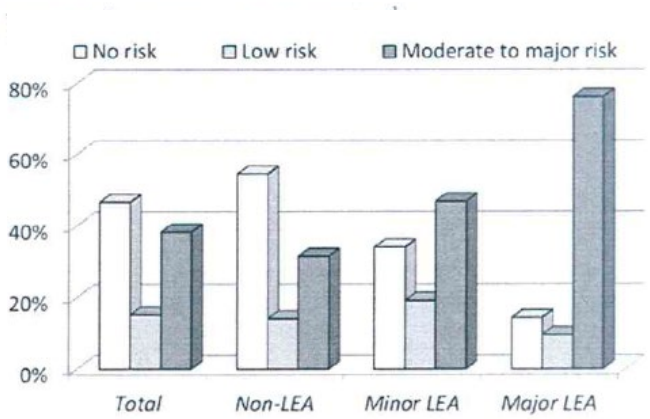
Research Article

The Geriatric Nutritional Risk Index Inde Predicts Mortality in Diabetic Foot Ulcers Undergoing Amputations



The impact of nutritional status on treatment outcomes of patients with limb-threatening diabetic foot ulcers

Bing-Ru Gau [a,b,1], Hsin-Yun Chen [c,1], Shih-Yuan Hung [a], Hui-Mei
Chung-Huei Huang [a], Jui-Hung Sun [a], Yu-Yao Huang [a,*]



Nutritional supplementation for diabetic foot ulcers: the first RCT

• **Results:** A third of the patients were classified as having protein-energy malnutrition at inclusion, with no difference between the two groups. Critical leg ischaemia was more common in the intervention group than in the placebo group (p=0.008). Nine patients in the intervention group (35%) and four in the placebo group (15%) dropped out of th study (not significant). Of those who completed the study, the wound had healed at six months in eigh of 17 (35%) (intervention) (not significant). Twent rition at inclusion had healed at six months comp

Malnutrition in type 2 diabetic | ulcers

A. Rouland[1] · C. Fourmont[1] · A. L. Sberna[1,2] · L. S Petit[1,2] · Benjamin Bouillet[1,2]

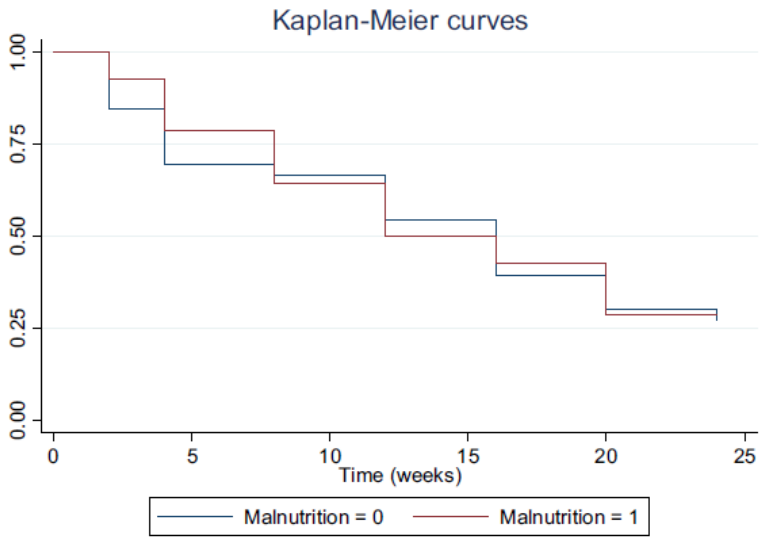


Fig. 1 Healing time according to the state of malnutrition at baseline (0: no malnutrition, 1: presence of malnutrition)

GLIM-criteria

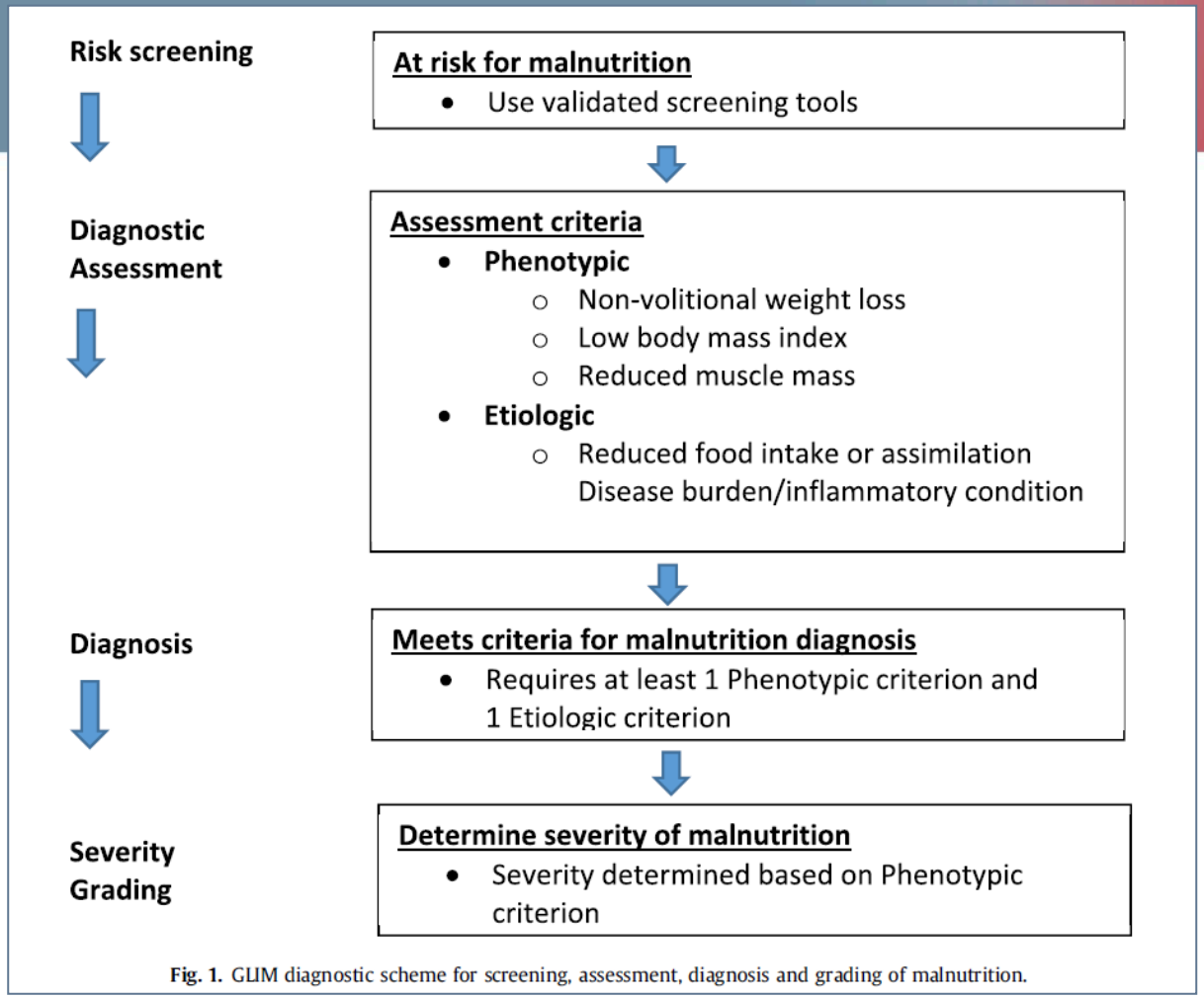


Fig. 1. GLIM diagnostic scheme for screening, assessment, diagnosis and grading of malnutrition.

Table 3
Phenotypic and etiologic criteria for the diagnosis of malnutrition.

Phenotypic Criteria[g]			Etiologic Criteria[g]	
Weight loss (%)	Low body mass index (kg/m^2)	Reduced muscle mass[a]	Reduced food intake or assimilation[b,c]	Inflammation[d–f]
>5% within past 6 months, or >10% beyond 6 months	<20 if < 70 years, or <22 if >70 years Asia: <18.5 if < 70 years, or <20 if >70 years	Reduced by validated body composition measuring techniques[a]	≤50% of ER > 1 week, or any reduction for >2 weeks, or any chronic GI condition that adversely impacts food assimilation or absorption[b,c]	Acute disease/injury[d,f] or chronic disease-related[e,f]

GI = gastro-intestinal, ER = energy requirements.

Eigen onderzoek: doelstelling

- Design
  - Prospectieve, observationale cohort studie
  - Single-centre (Universitait Ziekenhuis Antwerpen)
  - 1/7/2016 > 30/6/2018

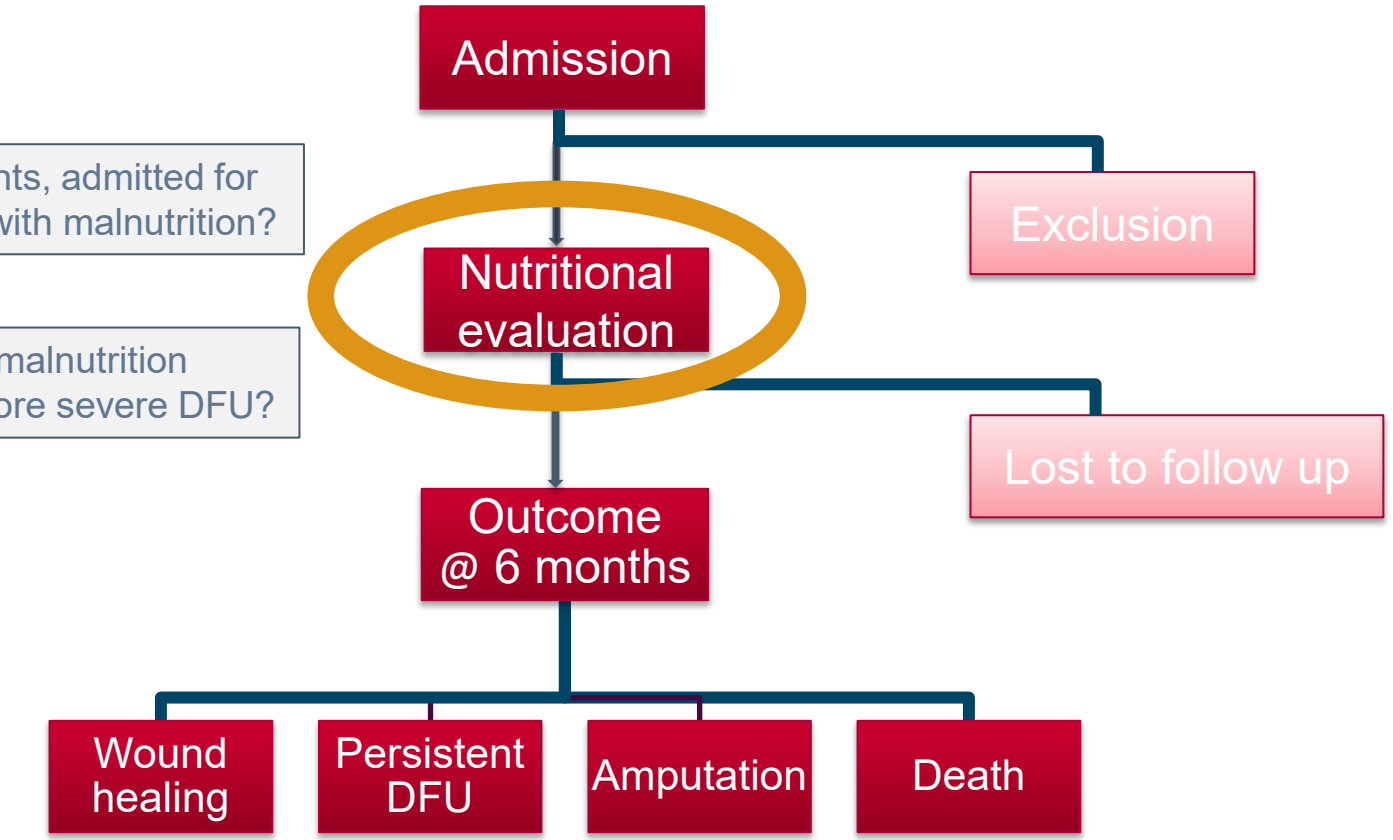
- Inclusie
  - Alle ptn, opgenomen met DFU

- Exclusie
  - Cognitief, taal
  - Opname voor andere reden dan DFU / overname andere afdeling/hospitaal
  - Urgente heelkunde
  - …

Studieprotocol

How many patients, admitted for a DFU, present with malnutrition?

Do patients with malnutrition present with a more severe DFU?



Do patients with malnutrition have a worse outcome of their DFU?

Methodologie

1. Evaluation of Nutritional Status: GLIM-criteria

- Patients grouped according to nutritional status:
  - Group A: normal nutritional status
  - Group B: moderately malnourished
  - Group C: severely malnourished

2. Evaluation of ulcer severity: SINBAD classification system

- SINBAD scores 0 or 1 to site, ischemia, neuropathy, bacterial infection, area and depth of the DFU; maximum (worst) score is 6.
- Multivariable regression analysis to determine the independent effects of multiple variables on DFU severity

3. Evaluation of outcome: healing, minor/major amputation, and death

- Multivariable regression analysis to determine the independent effects of multiple variables on DFU outcome (wound healing + minor amputation @ 6 months)

Resultaten: prevalentie van malnutritie

Patient characteristics

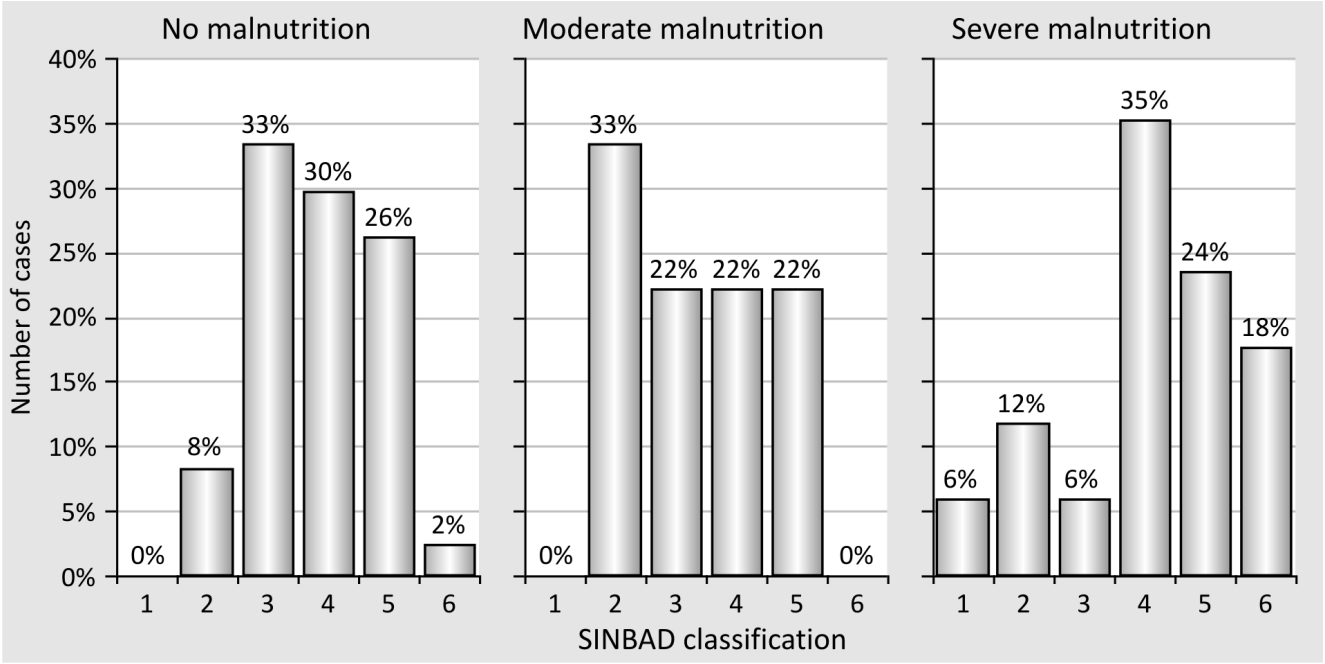
N	110
Age (min-max)	68 (31 – 92)
Gender (male: %, n)	80% (88)
Type of DM (type 1/type 2: %, n)	16/83% (18/92)
Duration of DM (min-max)	22 years (0-58)
HbA1c (min-max)	7,4 % (3,2 – 15)
History of (n)	
Neuropathy	80,9% (89)
Peripheral arterial disease	40,0% (44)
Cardiac disease	57,3% (63)
DFU	54,5% (60)
Amputation	29,1% (32)

Prevalence of malnutrition

	Nutritional status		
	Normal	Moderately malnourished	Severely malnourished
N (%)	84 (76,4%)	9 (8,2%)	17 (15,4%)

Patient demographics and diabetes characteristics were comparable between these 3 groups.
History of DFU or amputation, as well as mean duration (111 days) and localization of the DFU (forefoot: 85%) were also equally distributed.
Osteomyelitis was highly prevalent (61%).

Resultaten: relatie met ernst van voetwonde?



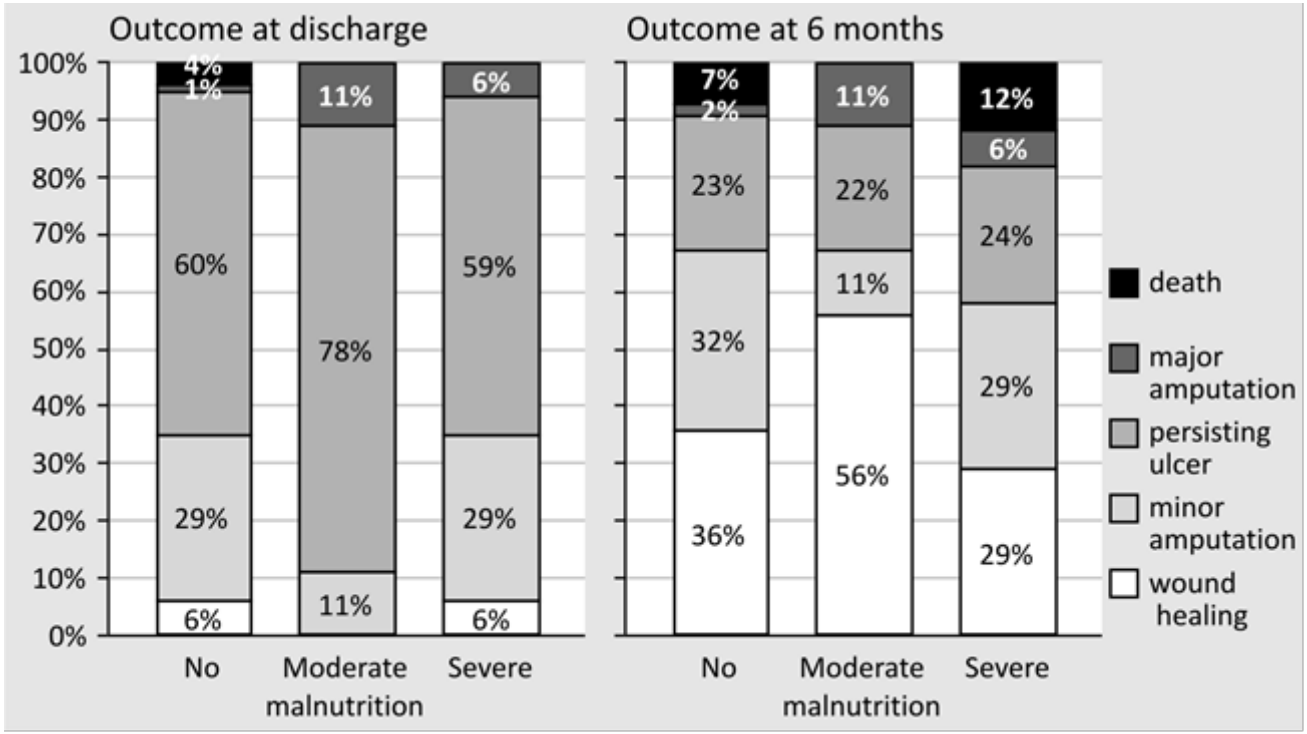
Mean SINBAD scores: 3.81 (A: no malnutrition); 3.33 (B: moderate malnutrtion); 4.12 (C: severe malnutrition)

Malnourished individuals presented with more severe ulcers:

group A vs. group B + C: $p = 0.012$; group C vs. B: $p = 0.001$; group C vs. A: $p < 0.0001$

Logistic regression analysis identified Hb ($p = 0.003$) and severe malnutrition ($p = 0.015$) as being independently associated with ulcer severity

Resultaten: invloed op outcome?



No differences were noted in outcome according to nutritional status at discharge and at 6 months.

Outcome at 6 months was determined by smoking (p=0.002), osteomyelitis (p=0.029) and HbA1c (p=0.029), but not by nutritional status.

Resultaten eigen onderzoek

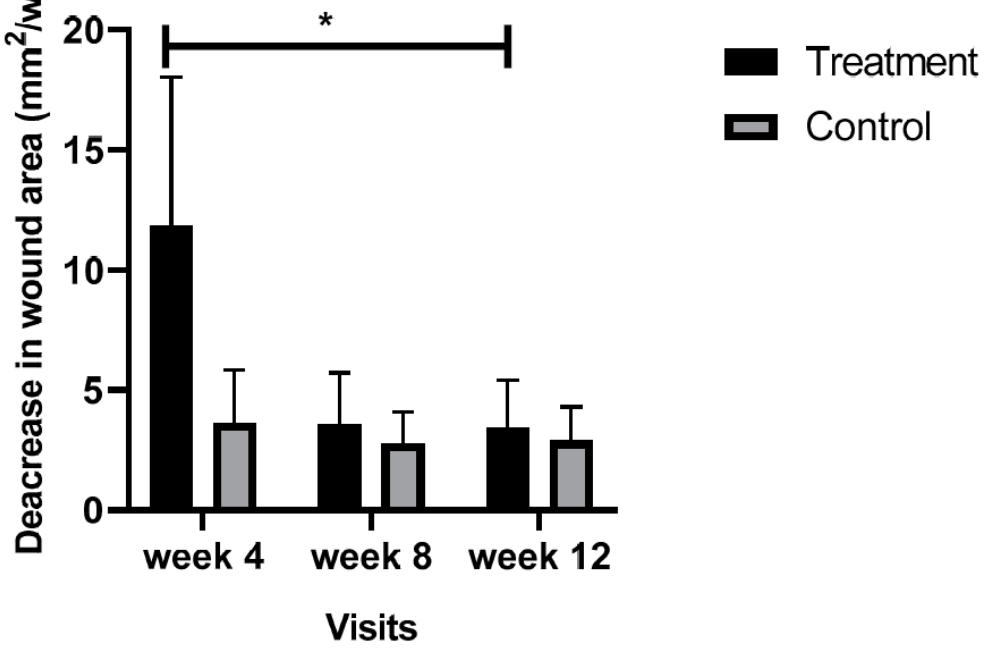
- Malnutrition is highly prevalent in hospitalised DFU patients
  - 24%
- Ulcer severity was defined by malnutrition
  - Severely malnourished patients presented with most severe ulcers
- Outcome at 6 months was not determined by malnutrition
- Implementation of nutritional care for patients with a diabetic foot ulcer (?)

Nieuwe studies

Article

Nutritional Supplementation Concurrent with Nutrition Education Accelerates the Wound Healing Process in Patients with Diabetic Foot Ulcers

Raedeh Basiri [1,2,*], Maria T. Spicer [1,3], Cathy W. Levenson [4], Michael J. Ormsbee [1,5,6], Thomas Ledermann [7] and Bahram H. Arjmandi [1,2,*]



Richtlijn IWGDF

- In individuals with active diabetic foot ulcers that are difficult to heal, do interventions aimed at correcting the nutritional status (including supplementation of vitamins and trace elements, pharmacotherapy with agents promoting angiogenesis) in comparison to standard care help promote healing?
- Recommendation 13: Do not use interventions aimed at correcting the nutritional status (including supplementation of protein, vitamins and trace elements, pharmacotherapy with agents promoting angiogenesis) of patients with a diabetic foot ulcer, with the aim of improving healing, in preference to best standard of care. (Strong; Low)
- Rationale: It is recognised that in individuals with DFUs, infection, antimicrobial agent use, and reduced mobility coupled with possible sub-optimal glycaemic control may drive a catabolic state leading to protein energy malnutrition as well as inherent inability to optimise macro and micronutrient usage.

Besluit

- Malnutritie komt vaak voor
  - Wordt wel erkend ivm rol in vertraagde wondheling, maar niet specifiek voor diabetische voet
  - Screening wordt opgenomen in vele ziekenhuizen, maar nog niet in (diabetische voet) richtlijnen
  - Rol van nutritionele ondersteuning / systematische bijvoeding?
- Nog veel onderzoek nodig!

En nu, tijd voor een break!