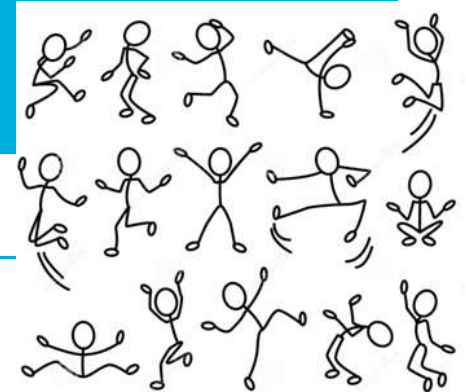


# Bewegen en belasten bij trauma's van de onderste extremiteit

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Fysiotherapeut RadboudUMC  
AZO 13/12/17



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# Gevolgen bedrust/immobilisatie

- Spierkracht
- Conditie
- Botdichtheid
- Complicaties (Pulmonaal, UWI, decubitus)

How to prevent the detrimental effects of two months of bed-rest on muscle, bone and cardiovascular system: an RCT, Scientific Reports 7, Article number: 13177 (2017) Andreas Kramer e.a  
Functional Impact of 10 Days of Bed Rest in Healthy Older Adults Patrick Kortebein e.a Journal of Gerontology: 2008, Vol. 63A, No. 10, 1076–1081

# Gevolgen bedrust/ immobilisatie

## Hospitalization-associated disability

Functionele achteruitgang bij 30 % van 70+

## Risicofactoren vertraagd herstel:

70+

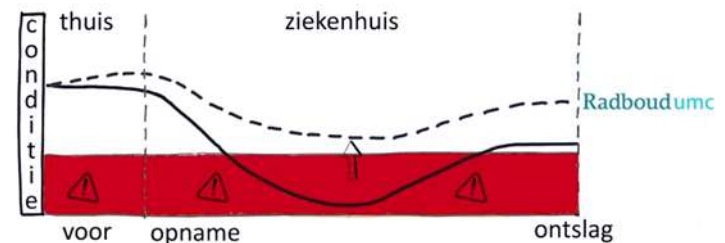
Trage loopsnelheid

Slechte functionele mobiliteit (TUG >10 s.)

Comorbiditeit

Sarcopene obesitas

## BiBo



Hospitalization-Associated Disability "She Was Probably Able to Ambulate, but I'm Not Sure" JAMA.

2011;306(16):1782-1793

Preoperative prediction of inpatient recovery of function after total hip arthroplasty using performance-based tests: a prospective cohort study. Oosting E, Disabil Rehabil. 2016

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# Wel of niet vroeg belasten?

Argumenten voor vroege belasting :

- + botdichtheid
- + mobiliteit
- + spierkracht/conditie
- + voeding gewrichtskraakbeen
- + bindweefsel
- + circulatie; afname DVT risico
- + preventie complicaties
- + coördinatie van bewegingen

Argumenten tegen vroege belasting :

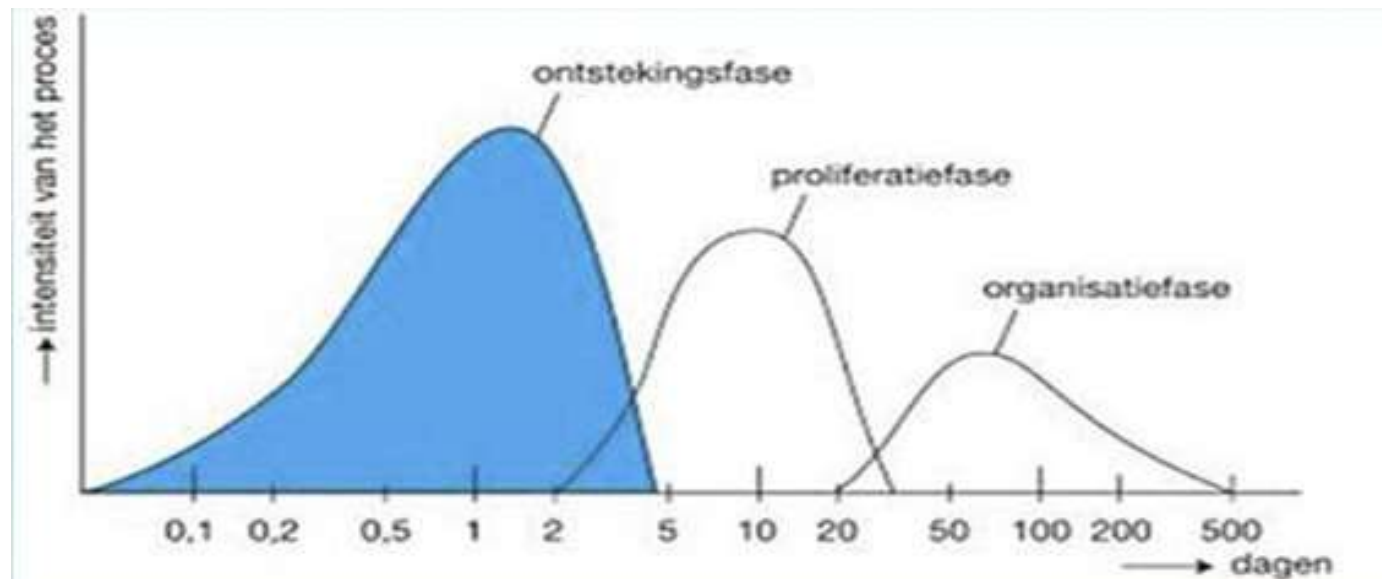
- materiaal falen
- secundaire dislocatie

+/- wondgenezing



# Wondgenezing en bewegen

- Ontstekingsfase: (0-5 dagen)
- Proliferatiefase (5 dagen -3 weken)
- Remodelleringsfase (3 weken -1,5 jaar)



Dynamiek van het menselijk bindweefsel , functie beschadiging en herstel, JJ de Morree

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# Belastbaarheid

De belasting van botten en gewrichten bij het lopen.

- Onbelast
- Partieel belast            10% belast  
   50% belast
- Volledig belast

---

# Onbelast mobiliseren



onbelast ≠ onbelast

---

# 10 % belast mobiliseren



3 puntsgang





---

# 10 % belasten

Klinisch: 1/3 belast >20%

Thuis: 2/3 belast >20%

## Risicofactoren

- 10% belasten (t.o.v. 50 %)
- Toename loopafstand
- Adipositas
- Weinig pijn
- Geen supervisie
- Angst om te vallen (klinische fase)
  
- Leeftijd



---

# 50% belast mobiliseren



3 puntsgang



fig. 4

fig. 5



---

# Volledig belast mobiliseren



2 puntsgang

**Opbouw belasting:**  
kwaliteit looppatroon  
klachten patiënt  
veiligheid



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# Oefenstabiel

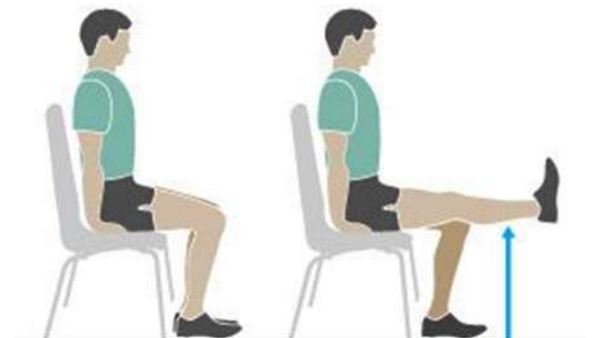
Het gewricht mag bewogen worden over het gehele bewegingstraject.

## Opbouw

van passief oefenen naar actief oefenen (MRC max 3)  
op geleide van klachten.

## Let op!

eindstandig (passief) mobiliseren  
lange lastarm



# OrthoLoad

Loading of Orthopaedic Implants

Home

Database

Infos

Publications

Data Sets

Team

OrthoLoad Club

Contact



Instrumented implants



Enter  
Database



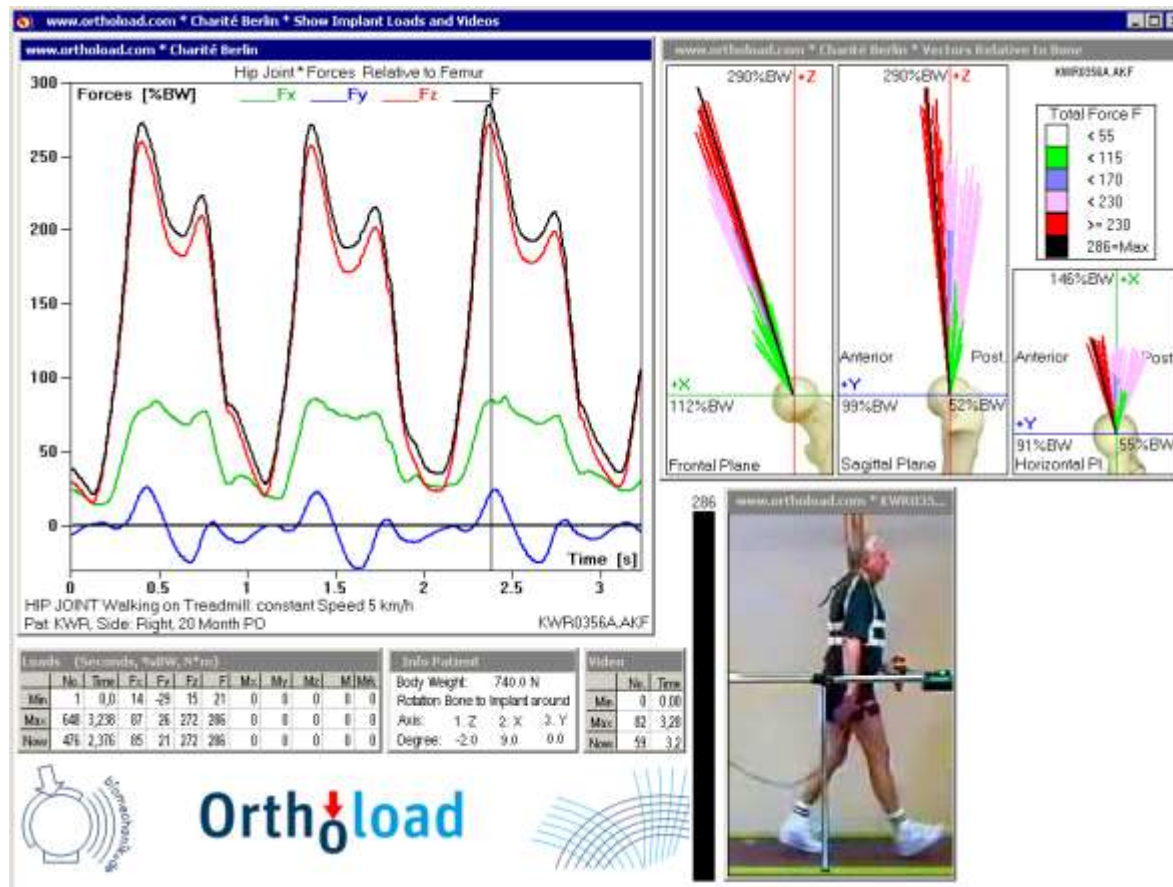
OrthoLoad is a free public data base. Access the loads acting in human joints!

The loads acting in human joints were measured in the Julius Wolff Institute of the Charité in Berlin directly in patients by using instrumented implants. Measurements during many routine and sportive activities were taken in hip, knee, shoulder and spinal implants. OrthoLoad supplies numerical load data and videos, which contain load-time diagrams and synchronous images of the subject's activities.

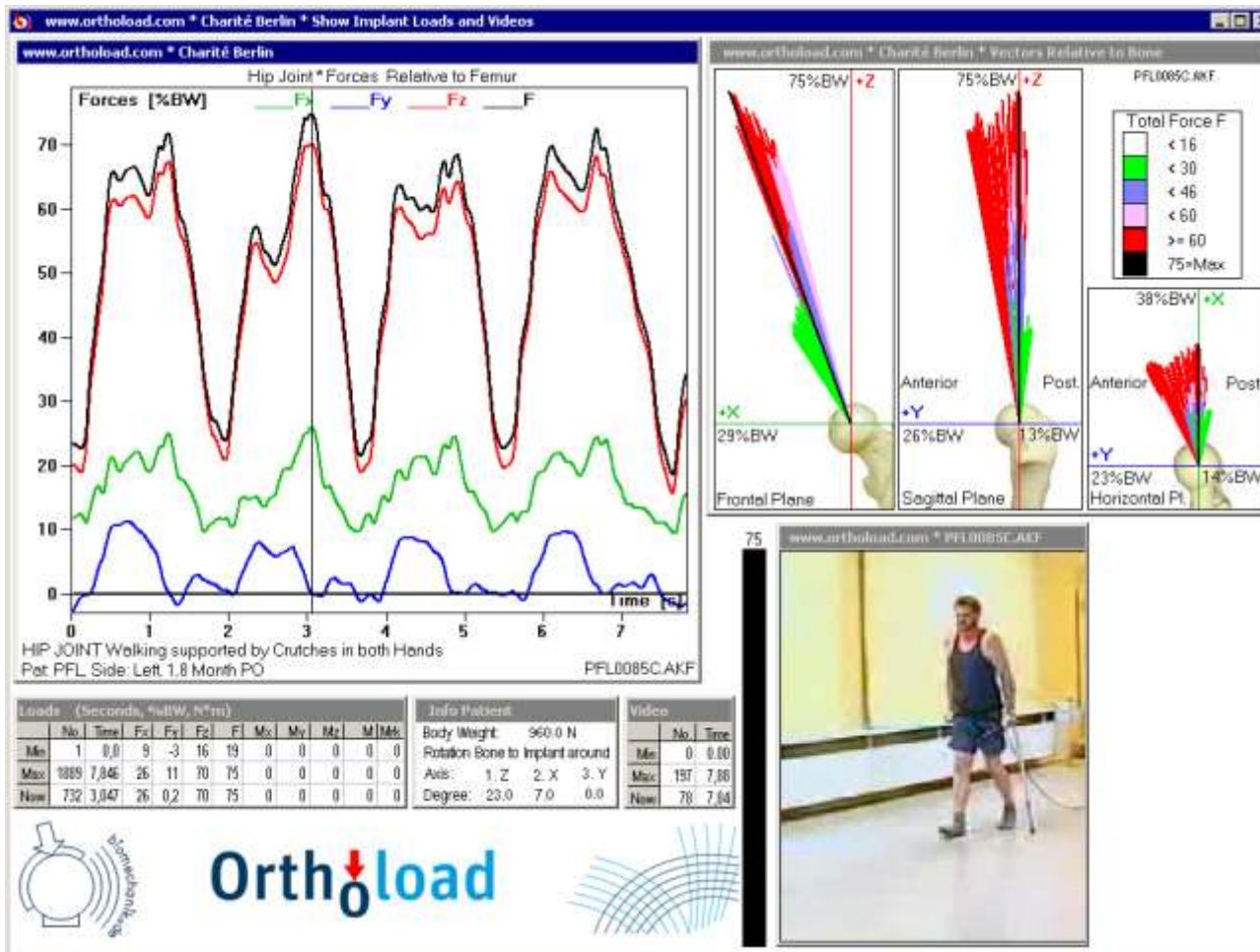
Additional information was captured, such as kinematic data or patient's morphology. Comprehensive data can currently only be provided for scientific partners in larger cooperative projects. Industrial partners can profit from our experience by a membership in the OrthoLoad Club.

The OrthoLoad team welcomes you and hopes that the provided data will be helpful for scientists, surgeons, physiotherapists, patients and the implant industry.

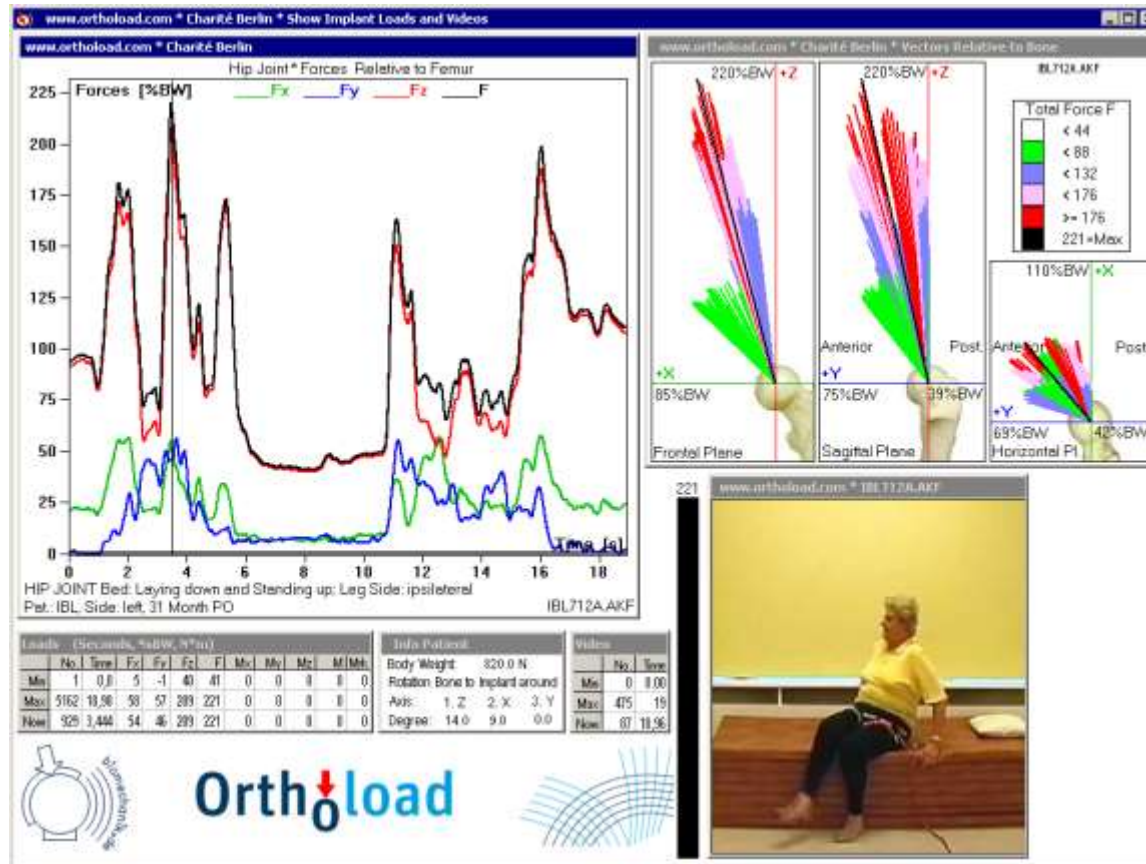
# Lopen 5 km/uur



# Lopen in 3 puntsgang



# In en uit bed komen





# Struikelen

Select Video by Implant + Activity

Implant:

Activity:

Parameter:

Patient:

File Name:

Select file name by mouse click  
Hold <strg>-key for multiple files

Select Video by File Name

Video Download List

Add Selected Video(s) to List

No Files for Download in Your List

Additional Data File

jb4541a.akf

Now Selected

www.orthoload.com \* Charité Berlin \* Show Implant Loads and Videos

**Hip Joint \* Forces Relative to Femur**

Forces [%BW]  $F_x$   $F_y$   $F_z$   $F$

HIP JOINT Stumbling  
Pat.: JB, Side: Right, 18 Month PO

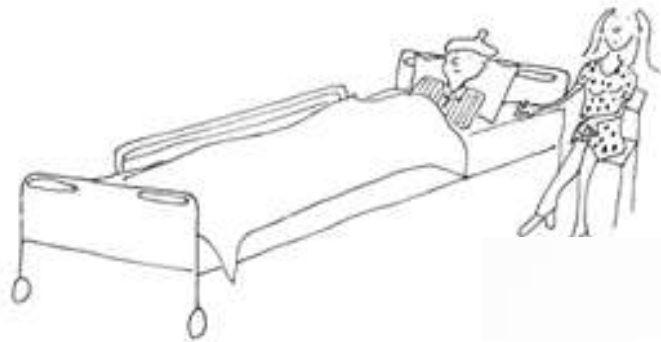
Loads (Seconds, %BW, N*ms)										Info Patient				Videos	
	No	Time	Fx	Fy	Fz	Mx	My	Mz	M/Mk	Body Weight	Rotation Bone to Implant around	Axis	No	Time	
Max	1	0.0	66	4	51	54	0	0	0	510.0 N	Rotation Bone to Implant around	1.2	2 X	3 Y	
Max	2016	6.322	315	131	807	870	0	0	0	150	6.32	Degree:	16.0	10.0	0.0
Max	365	3.095	300	125	807	870	0	0	0	150	6.32	View	26	5.20	

Orthoload

HIP JOINT Stumbling  
Pat.: JB, Side: Right, 18 Month PO

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# Beter uit bed



Uitnodigende omgeving  
Functioneel; ADL vaardigheden  
Multidisciplinair



- 
- vroeg functioneel bewegen
  - zoveel mogelijk oefen- en belastingstabiele situatie
  - vooral bij ouderen

