

Bevægeapparatets biomekanik

Henrik, sektion for Idræt

- specifikt ...

Ledbelastning (klinisk)

- Generel forståelse
- Intervention
 - Kirurgi
 - Rehabilitering

Muskelfunktion (Idræt)

- Generel forståelse
- Intervention
 - Træning (styrke/power)

Metoder

Eksperimentelt

- Bevægelsesanalyse
- Muskelfunktionsmålinger
(kraft, forkortningshastighed)

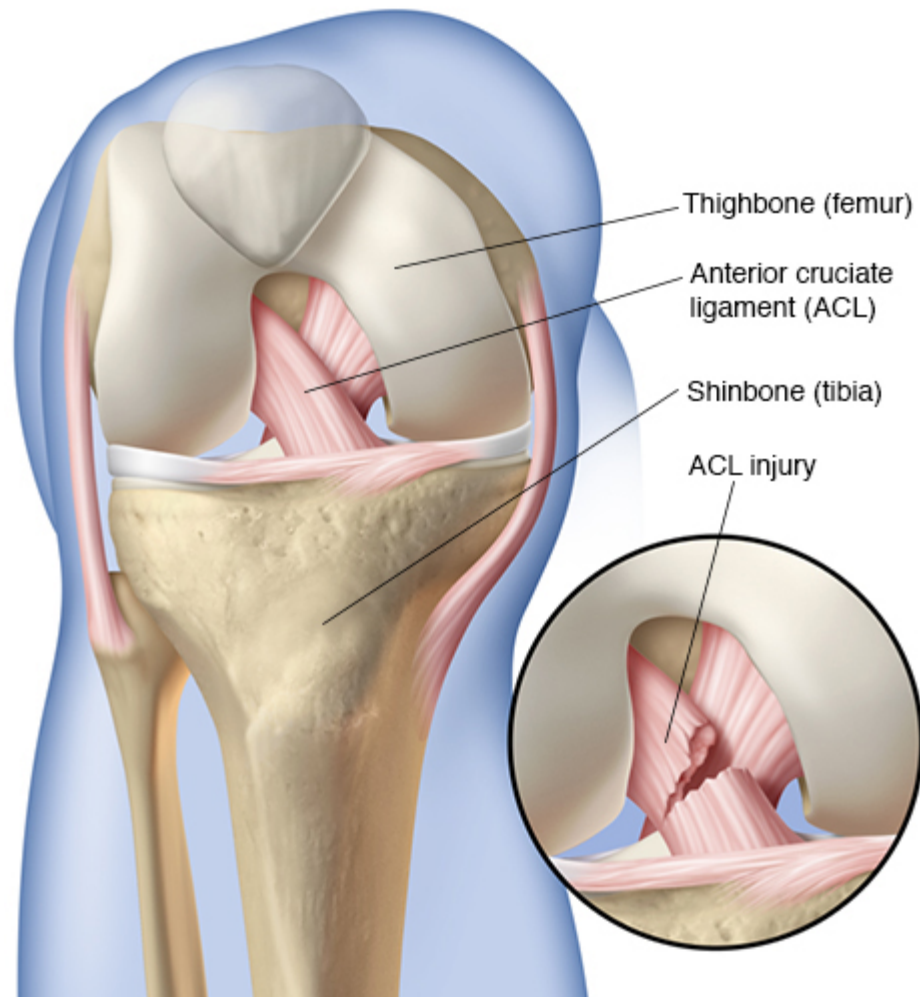
Computational biomechanics

- Matematisk modellering
- Computer simulation

Projekter

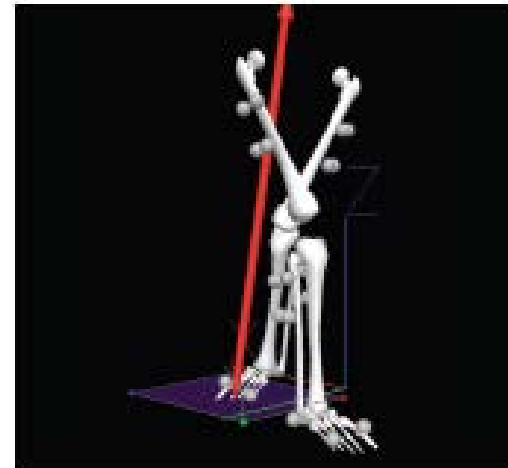
- ACL–rekonstruktion
- Osseointegreret protese
- Hoftedysplasi
- Løbeskader
- Kontraktionsdynamik

ACL-rekonstruktion



ACL-rekonstruktion

(double bundle vs. single bundle)



ACL-rekonstruktion

(double bundle vs. single bundle)

Knee Surg Sports Traumatol Arthrosc (2015) 23:3473–3481
DOI 10.1007/s00167-014-3156-5



KNEE

Rotational laxity after anatomical ACL reconstruction measured by 3-D motion analysis: a prospective randomized clinical trial comparing anatomic and nonanatomic ACL reconstruction techniques

Marie Bagger Bohn • Henrik Sørensen •
Mette Krintel Petersen • Kjeld Søballe •
Martin Lind

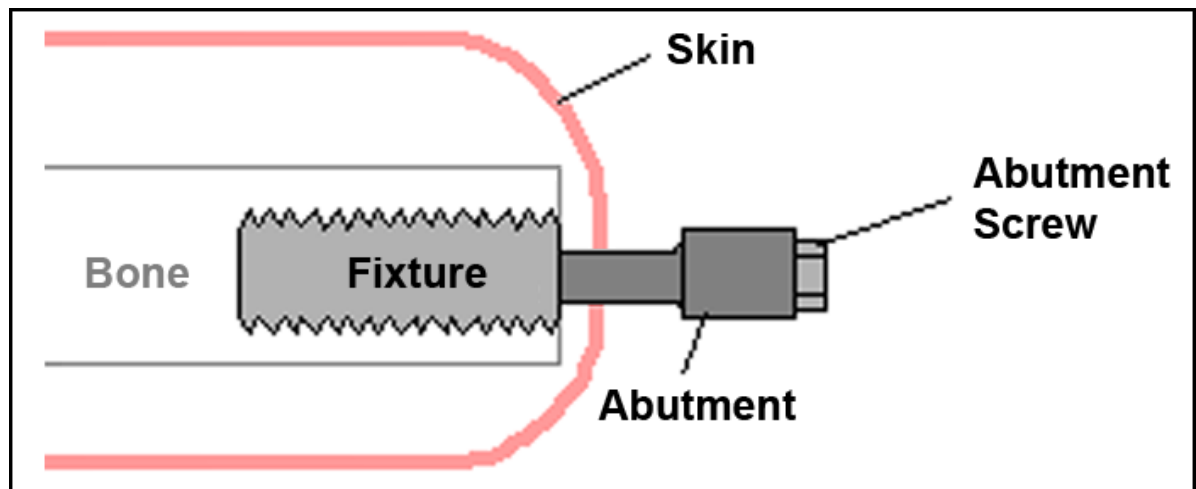
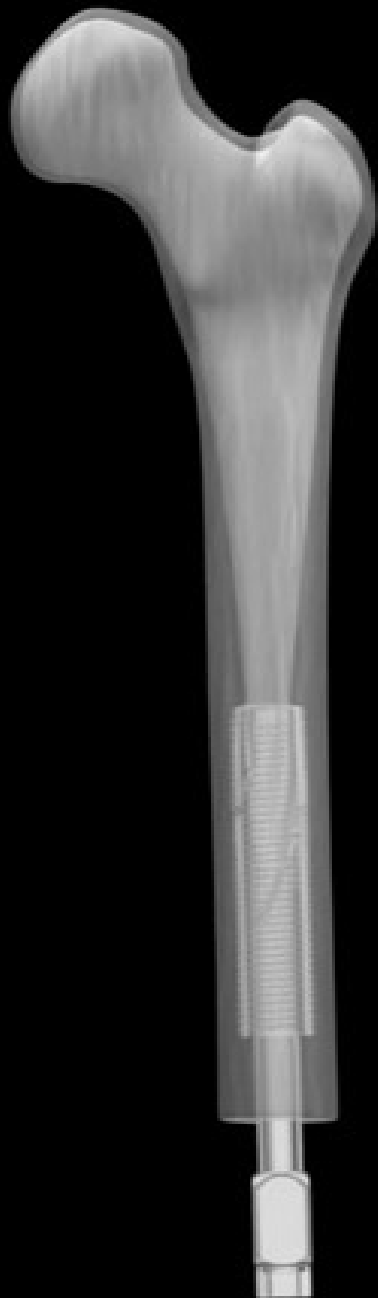
*Osseointegrated prosthesis for
trans-femoral amputee.
A new treatment in Denmark*

Klaus Kjær Petersen, Jørgen Peter Holmberg Jørgensen,
Dennis Nielsen, Nikolai Christensen, Henrik Sørensen

OI-proteser

(osseointegreret vs. konventionel hylsterprotese)

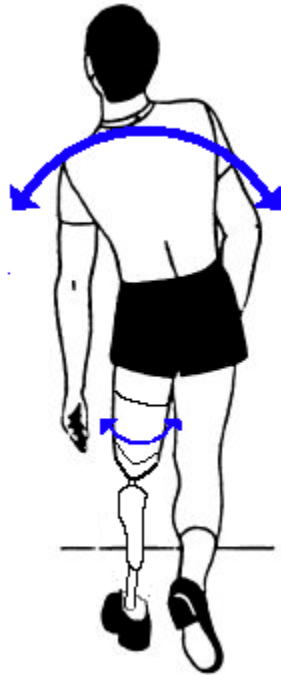
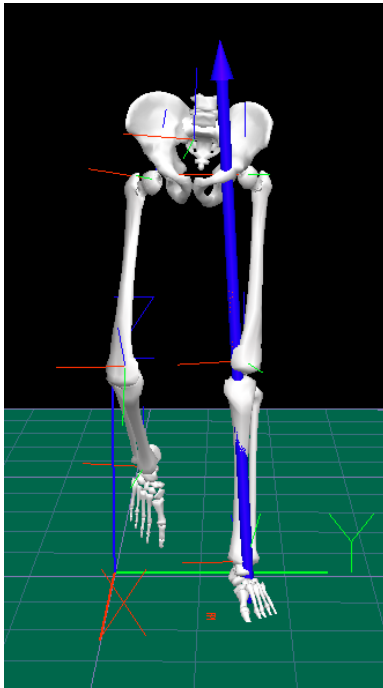




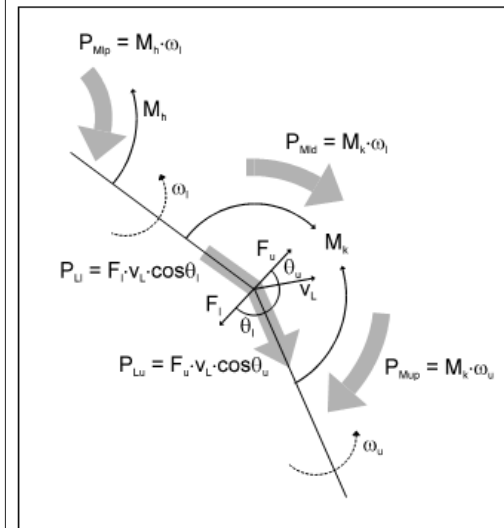
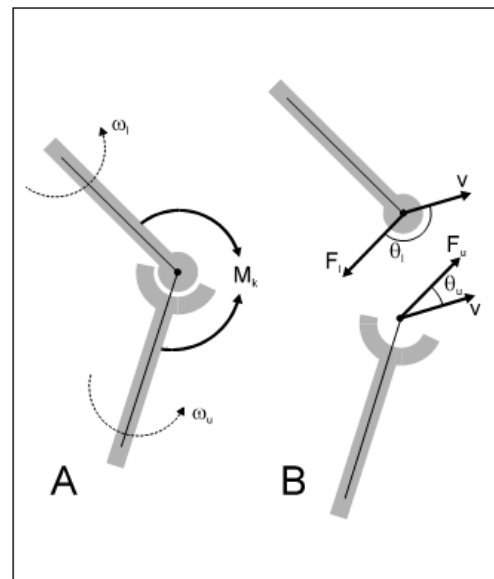


OI-proteser

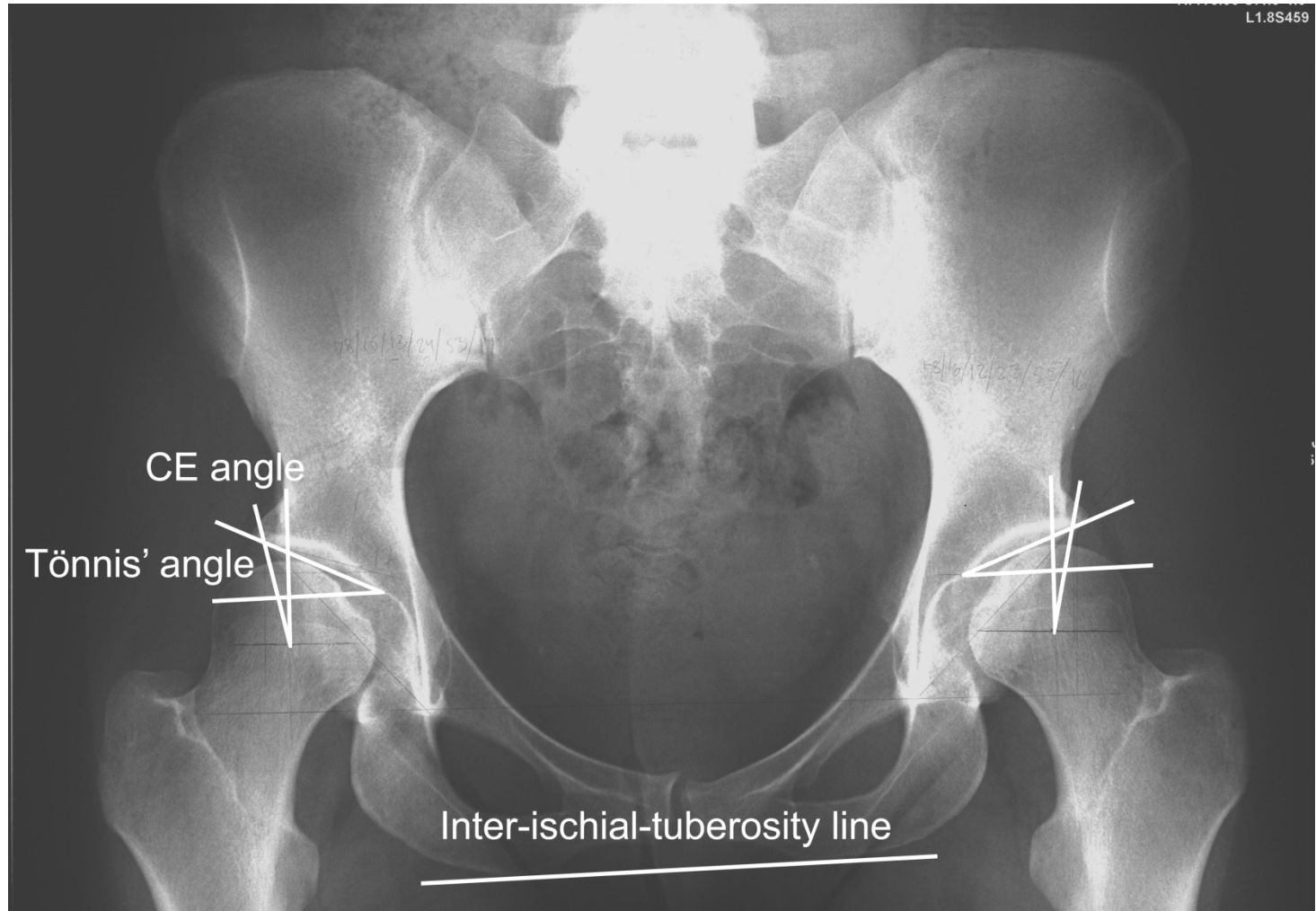
(osseointegreret vs. konventionel hylsterprotese)



- Iltoptagelseshastighed (nyttevirkning)
- "Almindelig" bevægelsesanalyse (gang, trapper, cirkel)
- Energitransport ml. segmenter

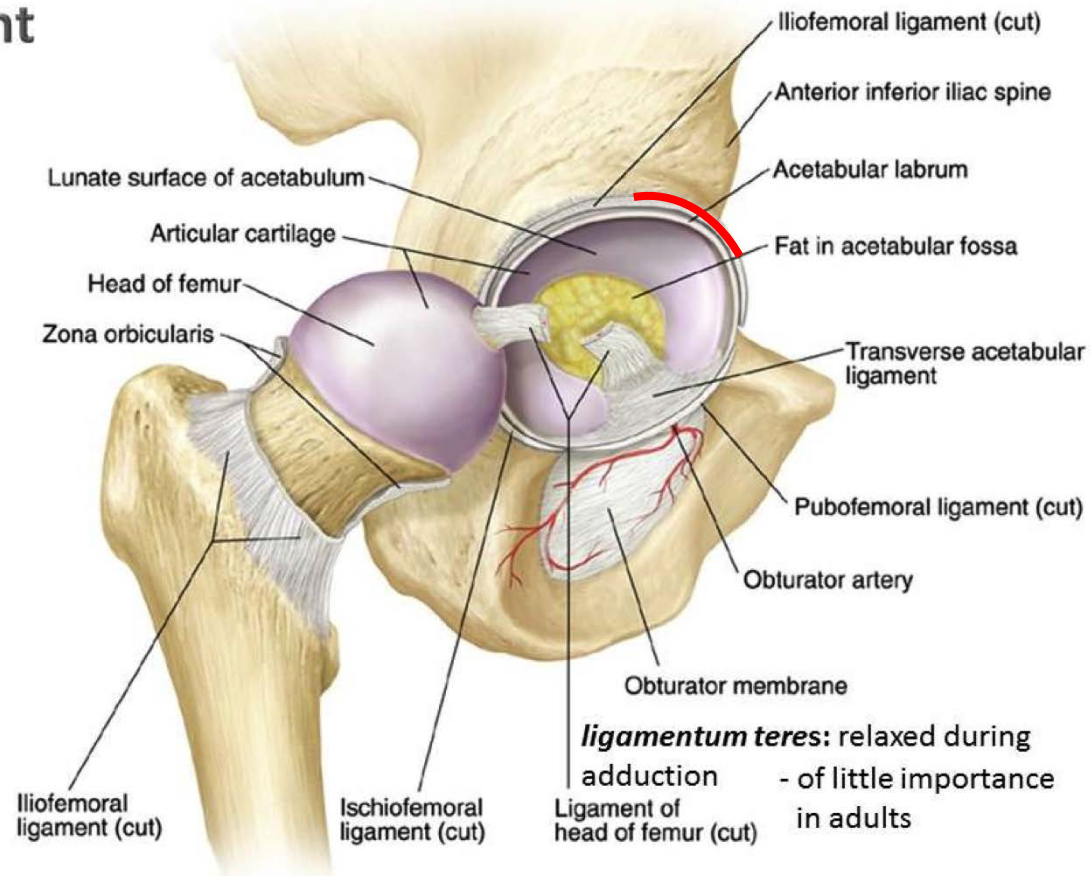


Dysplasi

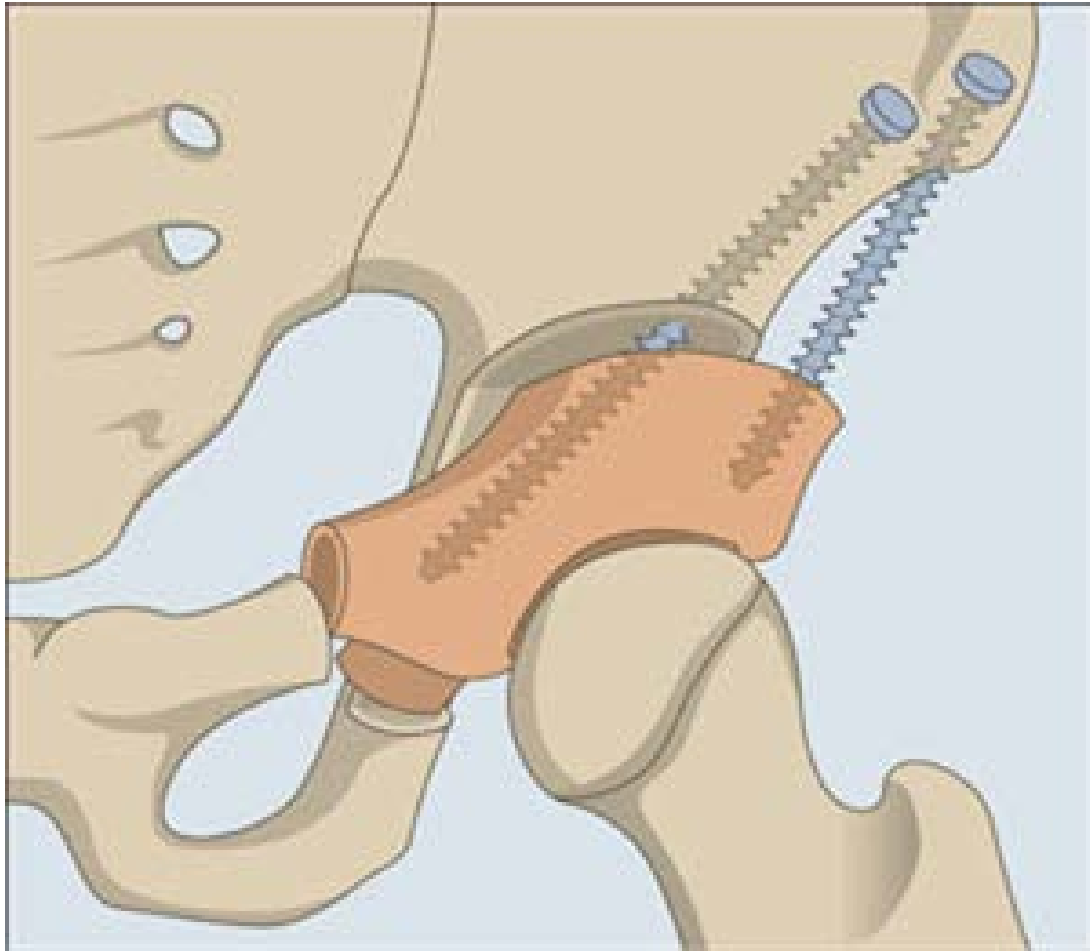


Dysplasi

Hip Joint



Kirurgi



Dysplasi

Acta Orthopaedica 2013; 84 (3): 265–270

265

Changes in walking and running in patients with hip dysplasia

Julie S Jacobsen¹, Dennis B Nielsen², Henrik Sørensen², Kjeld Søballe³, and Inger Mechlenburg³

¹Department of Physiotherapy and Occupational Therapy, Aarhus University Hospital; ²Department of Sport Science, Aarhus University; ³Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark.

Correspondence: julie_svj@hotmail.com

Submitted 12-07-04. Accepted 13-01-14

592

Acta Orthopaedica 2014; 85 (6): 592–599

Joint kinematics and kinetics during walking and running in 32 patients with hip dysplasia 1 year after periacetabular osteotomy

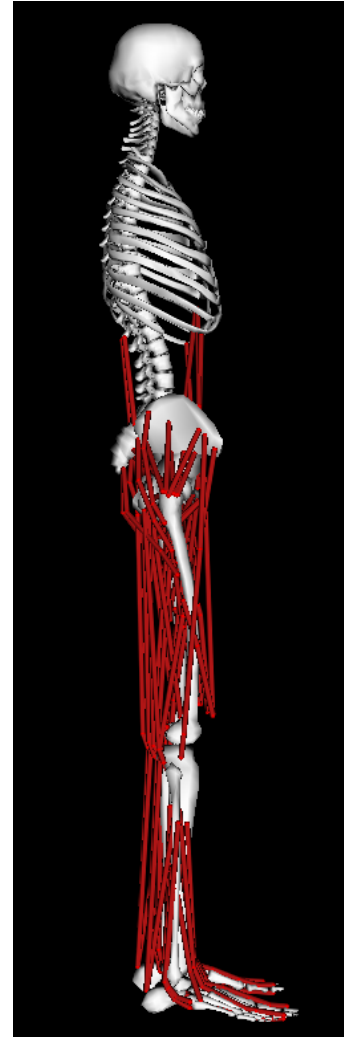
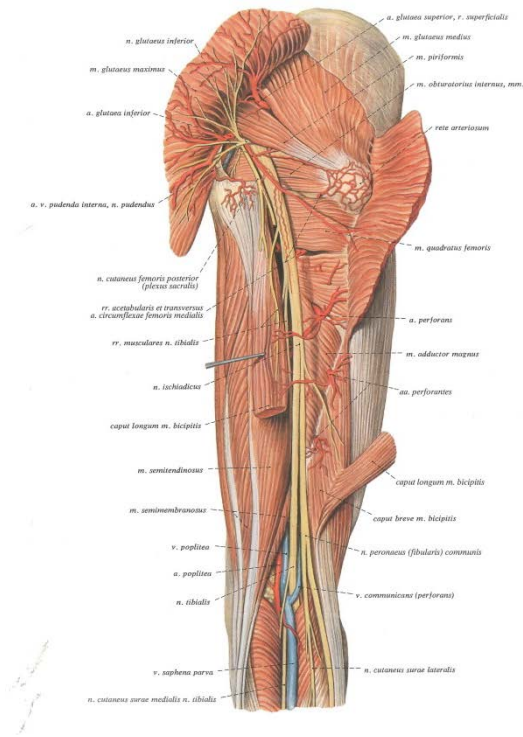
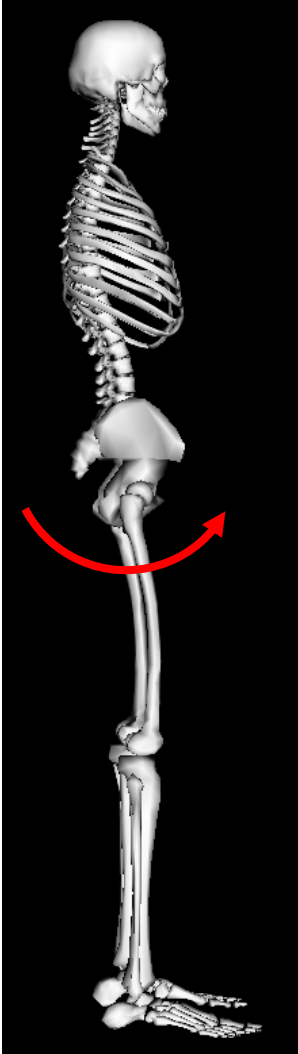
Julie S Jacobsen¹, Dennis B Nielsen², Henrik Sørensen², Kjeld Søballe³, and Inger Mechlenburg³

¹Department of Physiotherapy and Occupational Therapy, Aarhus University Hospital; ²Department of Sports Science, Aarhus University; ³Department of Orthopaedic Surgery, Aarhus University Hospital, Aarhus, Denmark..

Correspondence: julie_svj@hotmail.com

Submitted 2014-01-09. Accepted 2014-07-18

Modelling

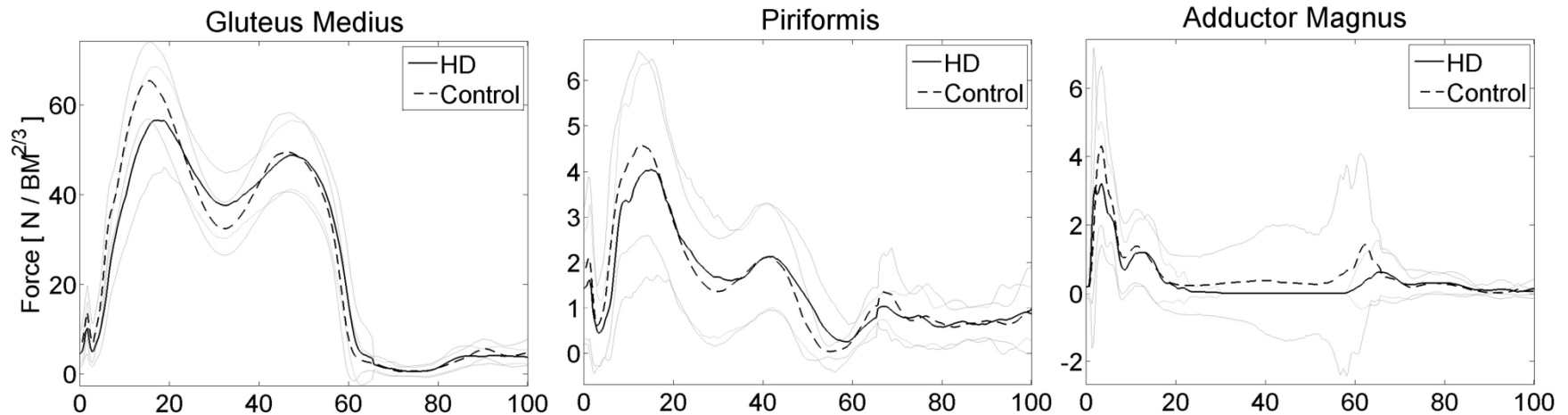
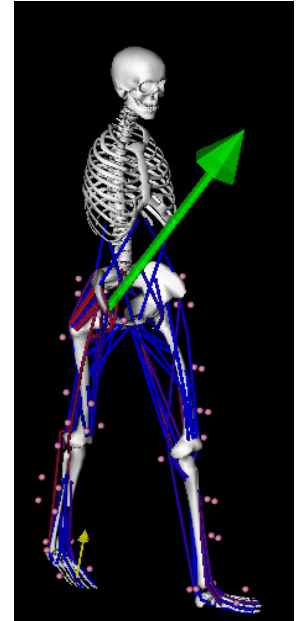


Muskel- og ledkontaktkraft



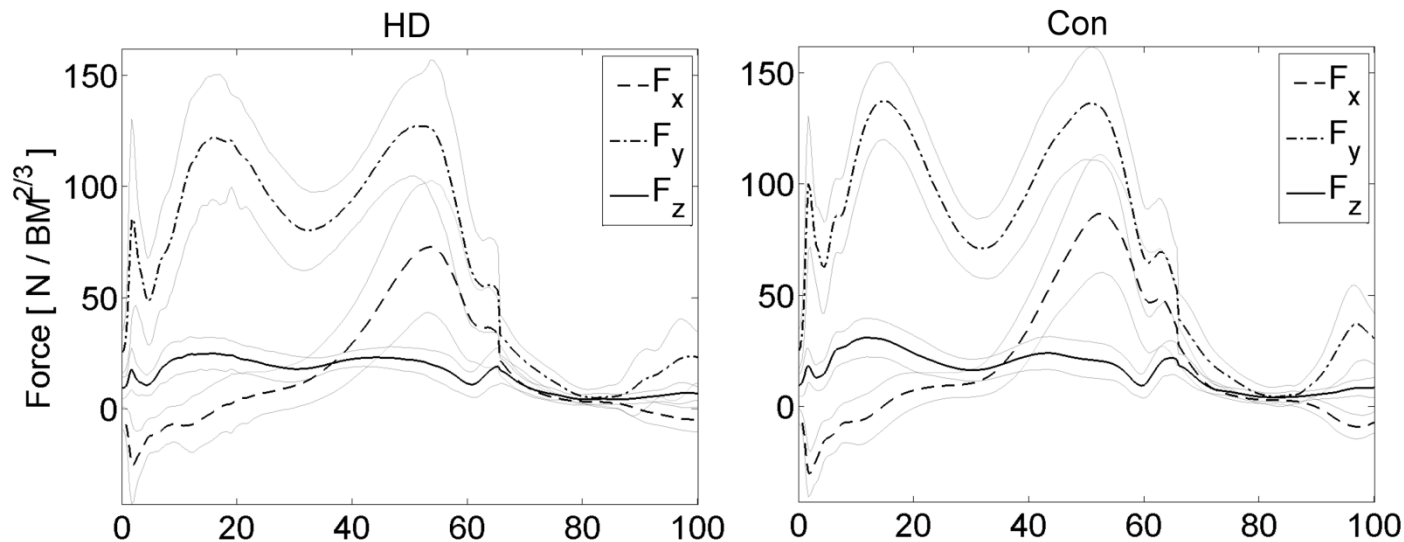
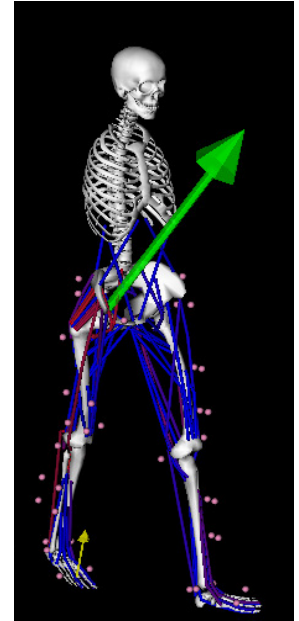
Resultater

- Muskelkræfterne er mindre og flyttet posteriort



Resultater

- Muskelkræfterne er mindre og flyttet posteriort
- Total og anterior ledkontaktkraft er signifikant mindre (peakkraft 3° mere posteriort)



Dysplasi



- Bevægelsesanalyse (gang, løb, hop)
- Isokin. dyn. (hofteflexion og -abduktion)
- Pre – Post 6 – Post 12

Løbeskader

Clinical Biomechanics 29 (2014) 959–964



Contents lists available at ScienceDirect

Clinical Biomechanics

journal homepage: www.elsevier.com/locate/clinbiomech



Comparisons of increases in knee and ankle joint moments following an increase in running speed from 8 to 12 to 16 km·h⁻¹☆



Jesper Petersen^{a,b,*}, Rasmus O. Nielsen^{a,b}, Sten Rasmussen^b, Henrik Sørensen^a

^a Section of Sport Science, Department of Public Health, Faculty of Health Sciences, Aarhus University, Dalgas Avenue 4, DK-8000 Aarhus C, Denmark

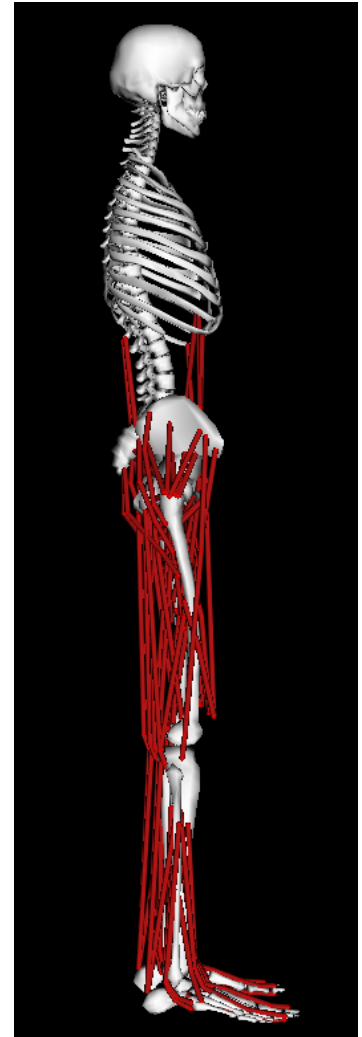
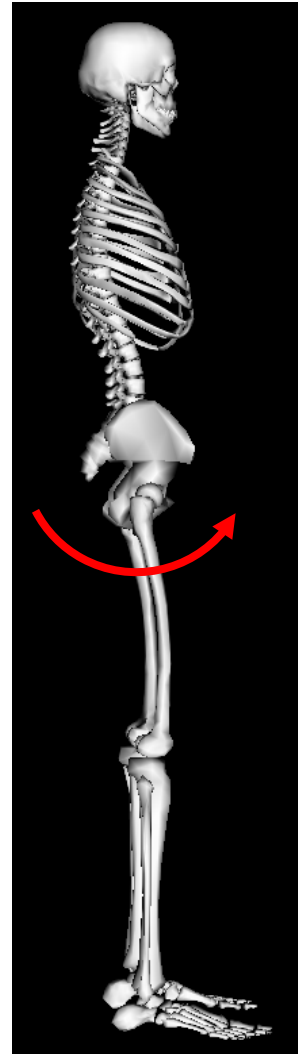
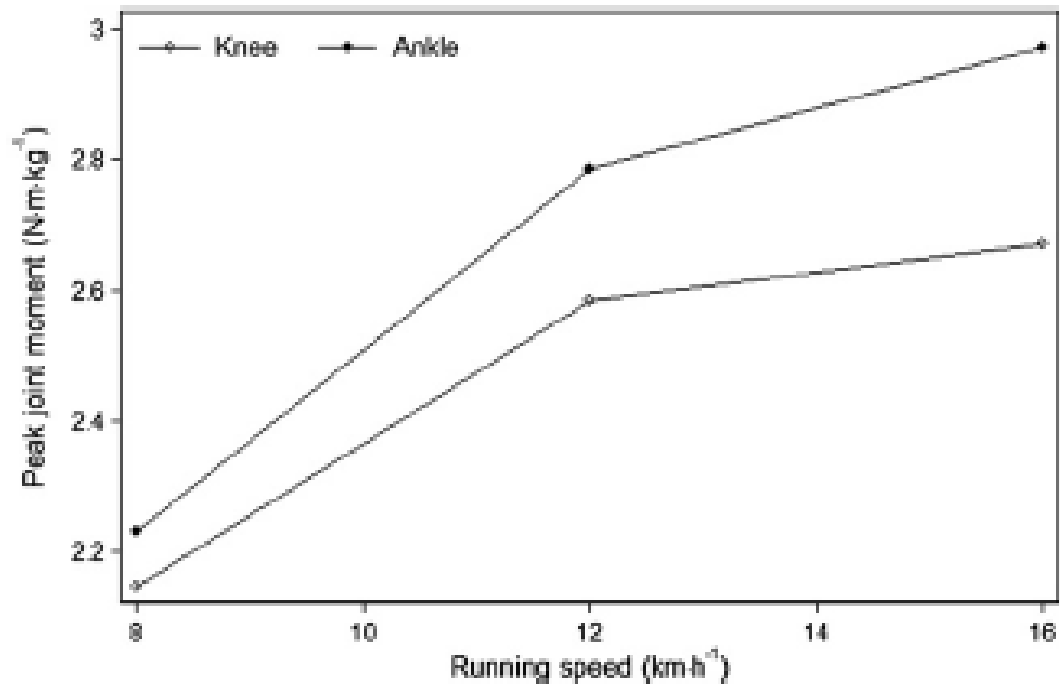
^b Orthopaedic Surgery Research Unit, Science and Innovation Center, Aalborg University Hospital, Sdr. Skovvej 15, DK-9000 Aalborg, Denmark

[RESEARCH REPORT]

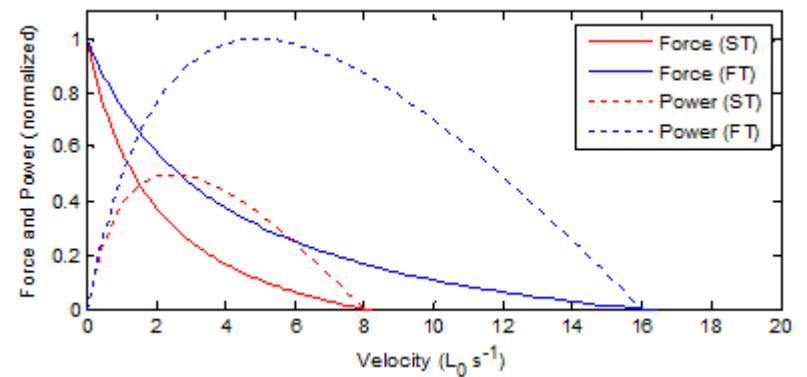
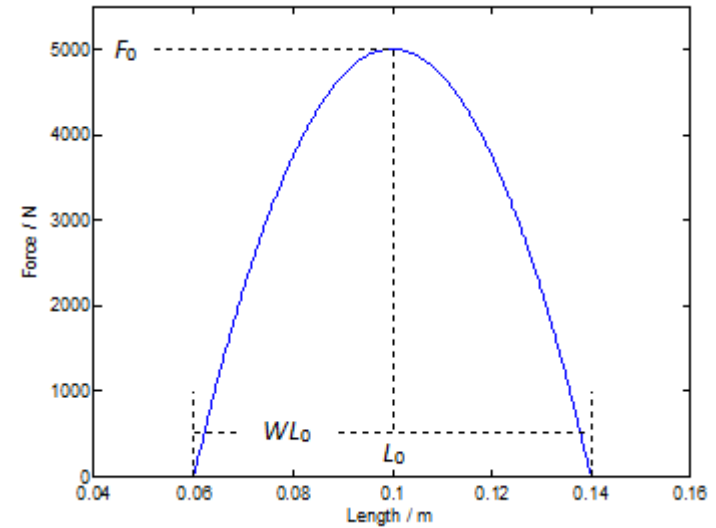
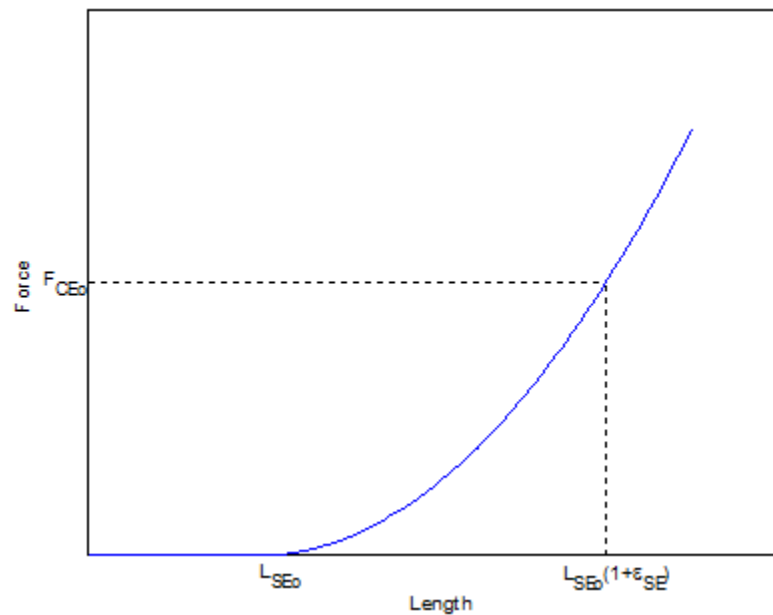
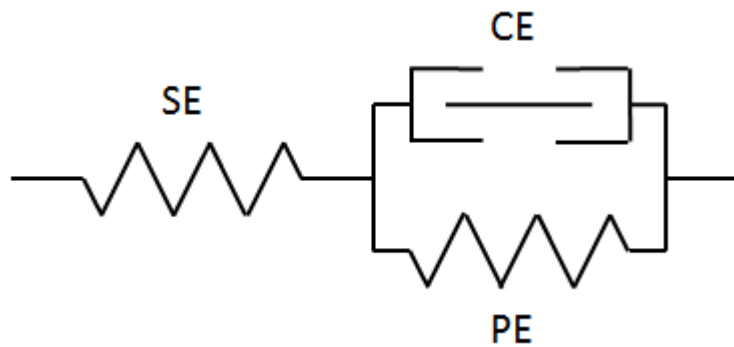
JESPER PETERSEN, PT, MSc¹ • HENRIK SØRENSEN, PhD¹
RASMUS ØSTERGAARD NIELSEN, PT, PhD¹

Cumulative Loads Increase at the Knee Joint With Slow-Speed Running Compared to Faster Running: A Biomechanical Study

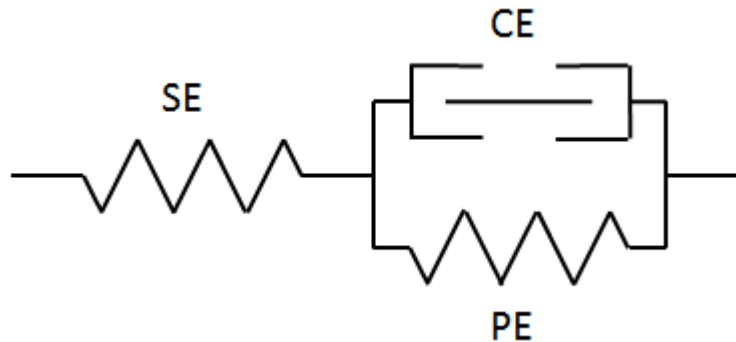
Løbeskader



Kontraktionsdynamik



Kontraktionsdynamik

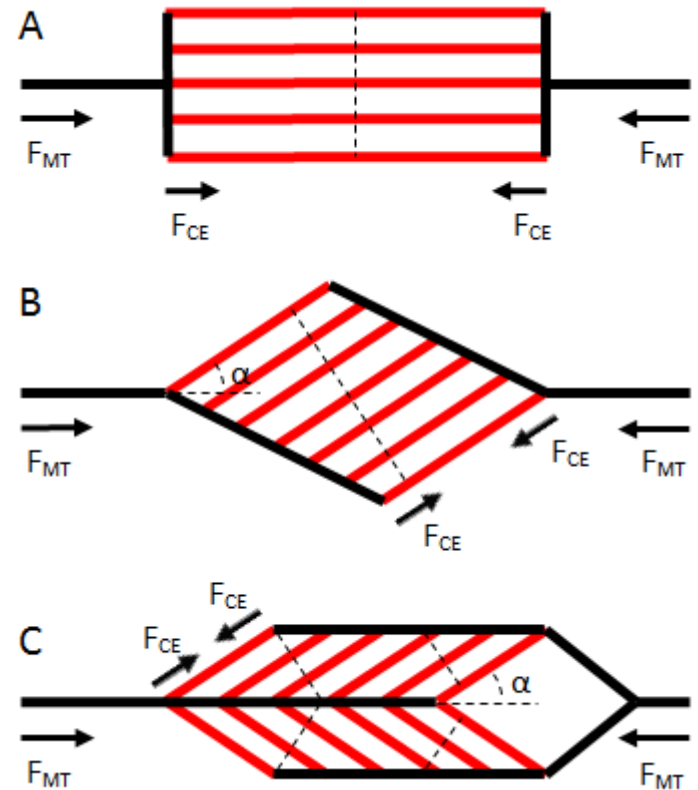
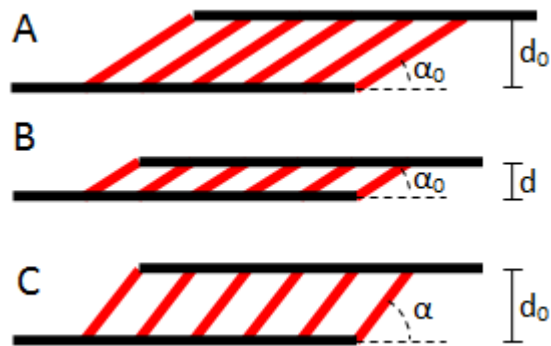
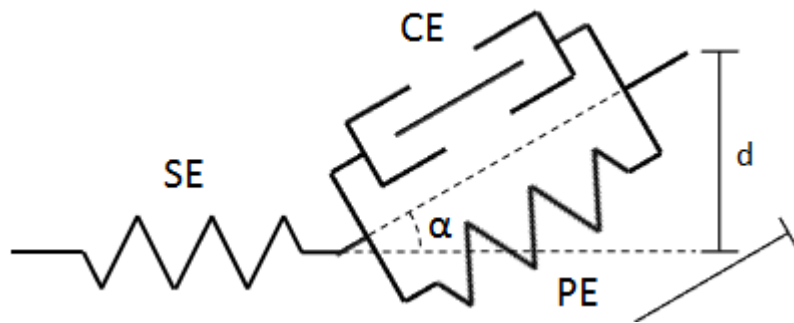


$$F(L) = F_0 \left[1 - \left(\frac{L - L_0}{\frac{W}{2} L_0} \right)^2 \right]$$

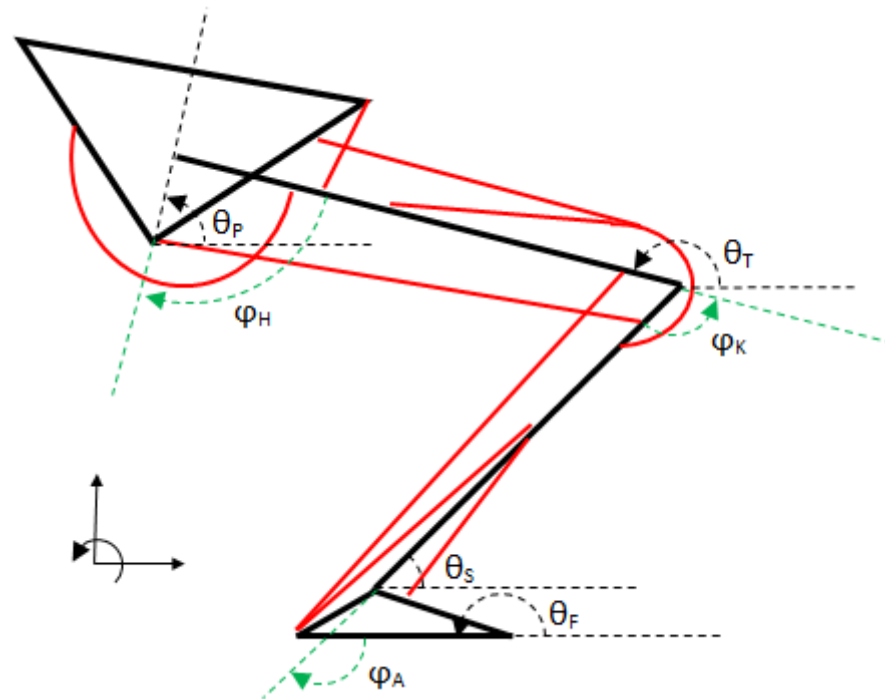
$$F_{SE}(L_{SE}) = F_{CE_0} \left(\frac{L_{SE} - L_{SE_0}}{\varepsilon_{SE} L_{SE_0}} \right)^2$$

$$F(v) = \frac{F_0 b - a v}{v + b}$$

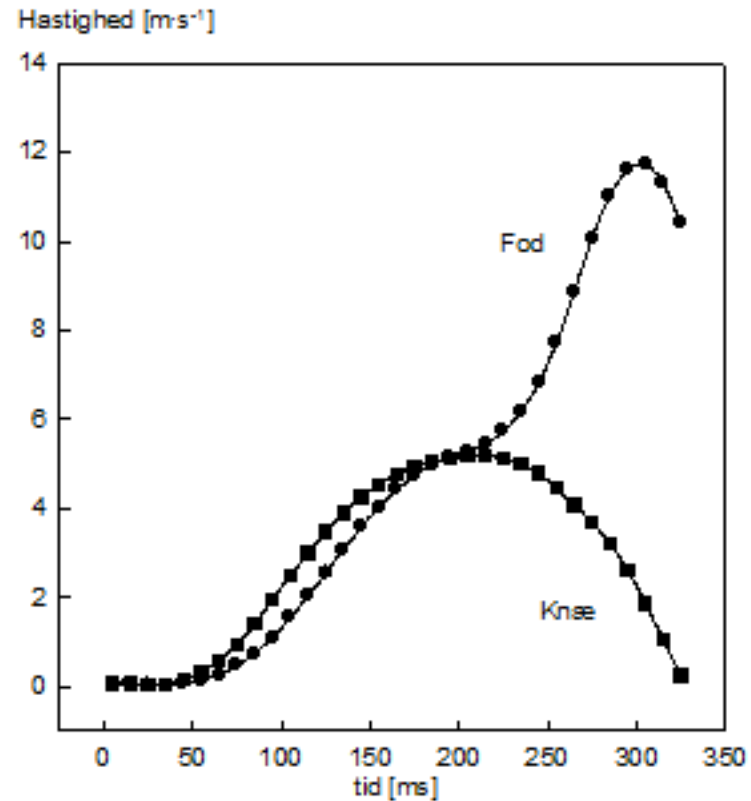
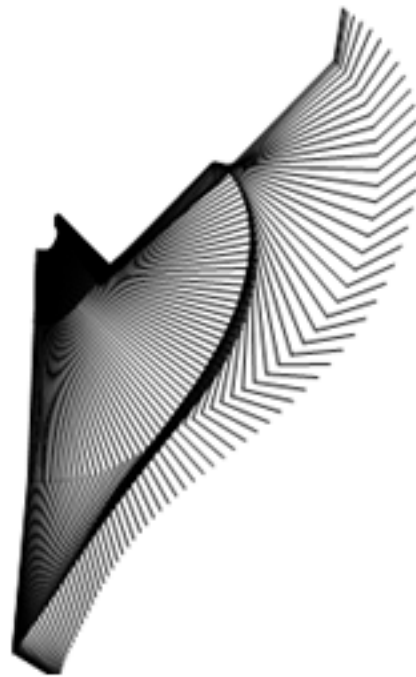
Kontraktionsdynamik



Kontraktionsdynamik



Kontraktionsdynamik



Kontraktionsdynamik

