

Angewendete Biomechanik

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Düsseldorf 14.11.2006



Geschichte

- ◆ Sommer 1997 bis April 1998 Gaitway Kistler System zum Testen in eigener Praxis
- ◆ Durchführen der Studie bei Patienten mit Kniebeschwerden
- ◆ Publikation
 - "Gang und Laufanalyse in der Physiotherapie. Möglichkeiten zur Behandlung von Kniebeschwerden bei Freizeitsportlern durch veränderte Lauftechnik".
- ◆ Wissenschaftlicher Preis der Gesellschaft für Sport Medizin Schweiz

Praxis



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Praxis



Seit Mai 1998 Gaitway im Einsatz

Angewandte Messtechniken

System Gaitway

Laufband mit eingebauten Piezo-Instrumenten von Kistler (Winterthur)



Kistler Schweiz

Anwendungen

- Motoren
- Fahrzeuge
- Fertigung
- Kunststoffe
- Biomechanik
- Beschleunigung
- Andere Anwendungen

Produkte

- Druck
- Kraft
- Beschleunigung
- Messen und Analysieren
- Zubehör

Kunden

- Forschung
- OEM
- Fabrikation
- Vertriebspartner

KISTLER suchen

Kategorie

measure. analyze. innovate

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Anwendungen

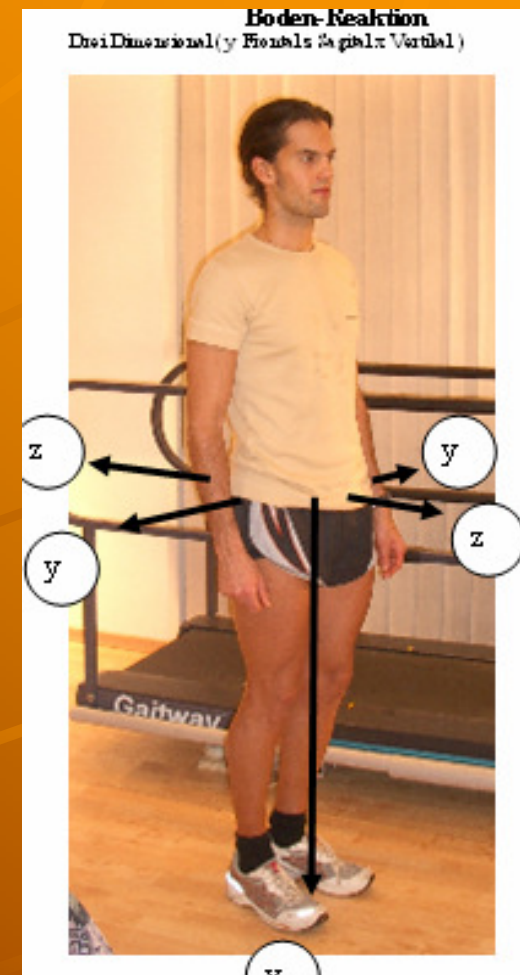
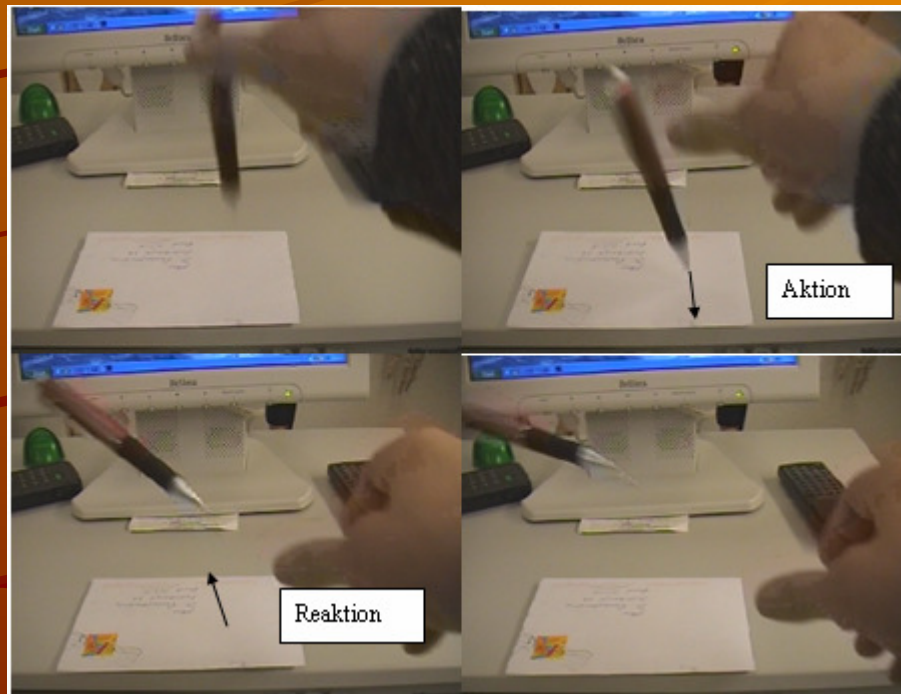
Biomechanik

Die Biomechanik beinhaltet das Studium des menschlichen Bewegungsprozess. Kistler Messplattformen ergeben genaueste Messinformationen über die vielfältig Kräfte, die durch Bewegungsreaktionen erzeugt werden.

Forschung + Entwicklung

Kistler Plattformen sind überall dort anwendbar, wo sie der Forscher gerade braucht, sei es zum Bewerten von dynamischen sportlichen Kräften bis hin zu der ruhigen rhythmischen Bewegung, stehend balancieren.

Aktion – Reaktion „Center of Pressure“



Erfassung des Patienten

Gaitway - []

File Edit View Window Help

General Comments Therapist Doctor

Last: ID:

First:

Street: DOB:

City: Gender:

State: Zip: Height:

Phone: Weight:

Date	Time	Description
18.05.2001	12:00:00	Walk 3.0 kmh kmh Barfuss
18.05.2001	12:00:00	Walk 3.0 kmh kmh Barfuss
22.05.2001	12:00:00	Walk 3.0 kmh Barfuss
25.05.2001	12:00:00	Walk 3.0 kmh Turnschuhen
25.05.2001	12:00:00	Walk 3.0 kmh Turnschuhen 10 % auf
30.05.2001	12:00:00	Walk 3.5 kmh Halen Turnschuhen
07.06.2001	12:00:00	Walk 4.0 kmh T.S.
04.07.2001	12:00:00	Walk 4.0 kmh T.S.
29.08.2001	12:00:00	Walk 4.0 kmh T.S.
03.12.2004	08:23:02	BF
03.12.2004	08:27:37	mBT
17.12.2004	09:07:56	mBT

Ready NUM

Aufnahmebereitschaft

Gaitway - [Gaitway.mdb]

File Edit View Setup Window Help

Parameter	Value
Date	18.05.2001
Time	12:00:00
Walking Speed	3.03 km/hour
Cadence	96.98 /min
Stride Length	0.01 m
Stride	71.88 7.81

File

Acquire Data

Subject Information

ID: Weight: kg

Last Name:

First Name:

Acquisition Information

Sampling Rate: ☒ Walk ☐ Run Trial Time (s):

Amplifier: ☐ Operate ☒ Reset

Amplifier Range: ☐ Low (1000N) ☒ High (3000N)

Trial Description :

{Gaitway.mdb}\Radovanovic, Dusa
Ready

8.05.2001 12:00:00

Logged in as: dusan (Radovanovic,Dusan)

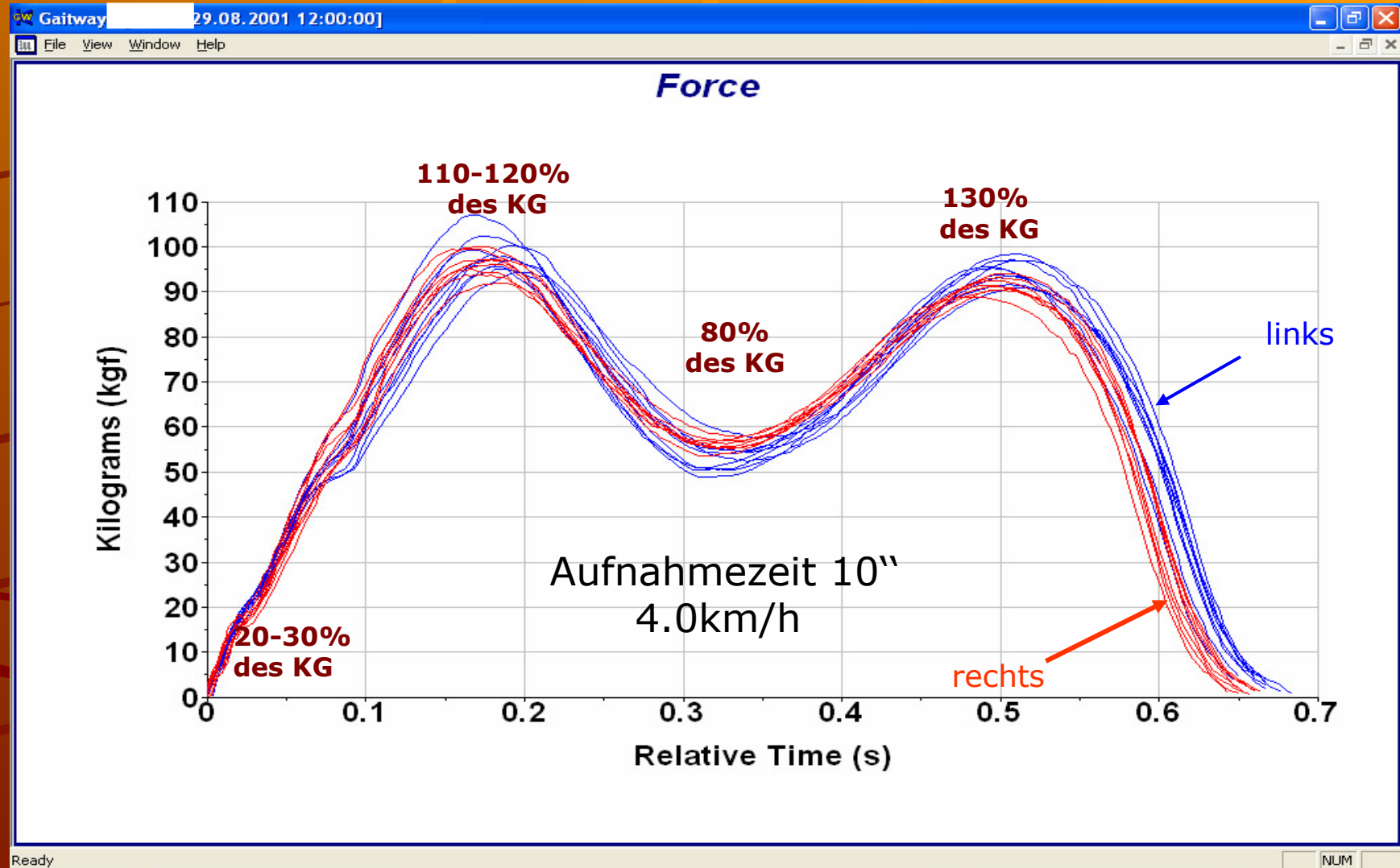
NUM

Start

Laufanal... Posteing... Eigene D... Microsof... Gaitway ... Desktop

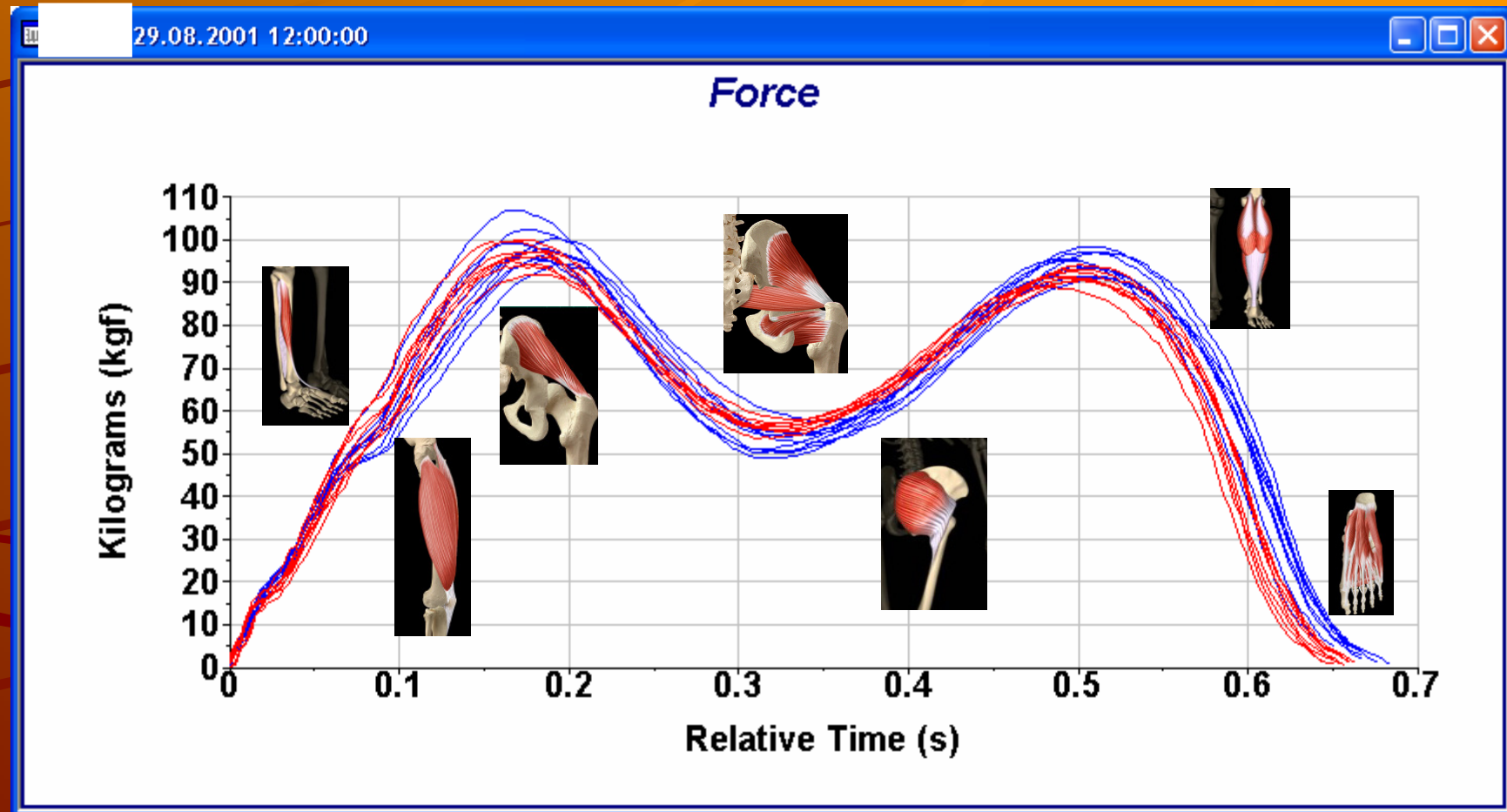
10:59

Vertikale Bodenreaktions-Kraft-Kurve



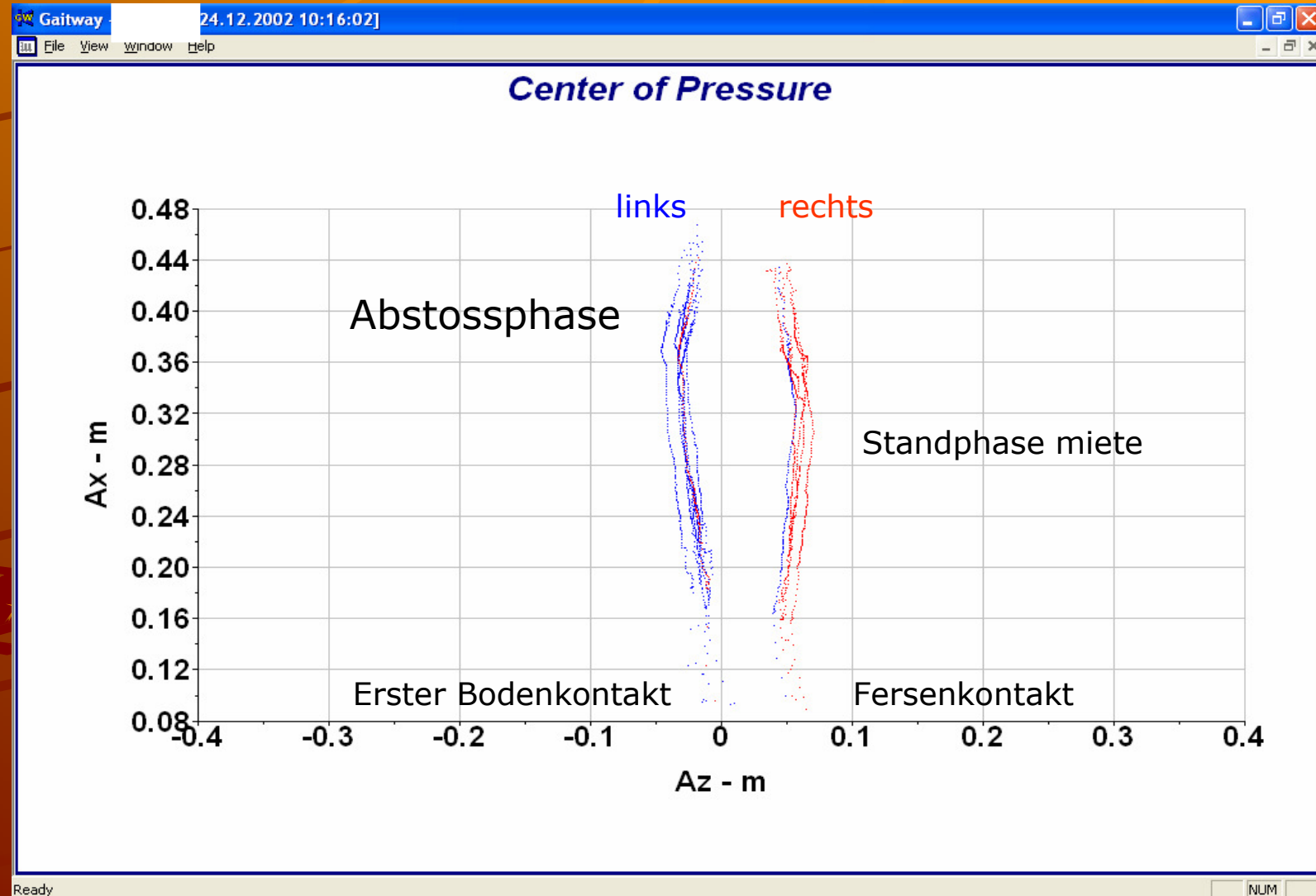
Gehen in Strassenschuhe

Ideale vertikale Bodenreaktions- Kraft-Kurve

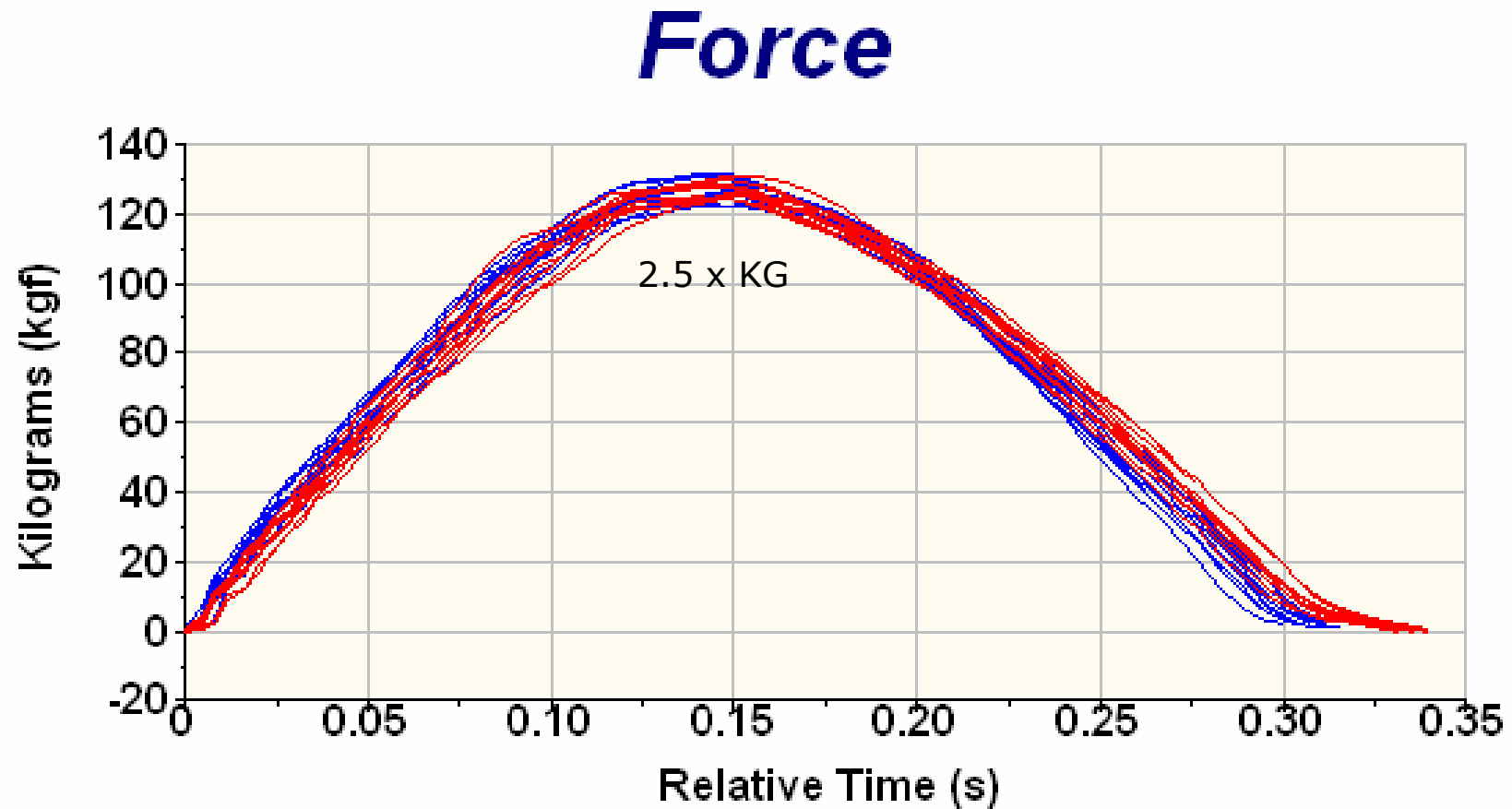


Gehen 4.03 km/h Kadenz 112 pro Min. 10" 9x li 8x re

Horizontale (Frontal) Bodenreaktions-Kraft-Kurve



Vertikale Bodenreaktions-Kraft-Kurve



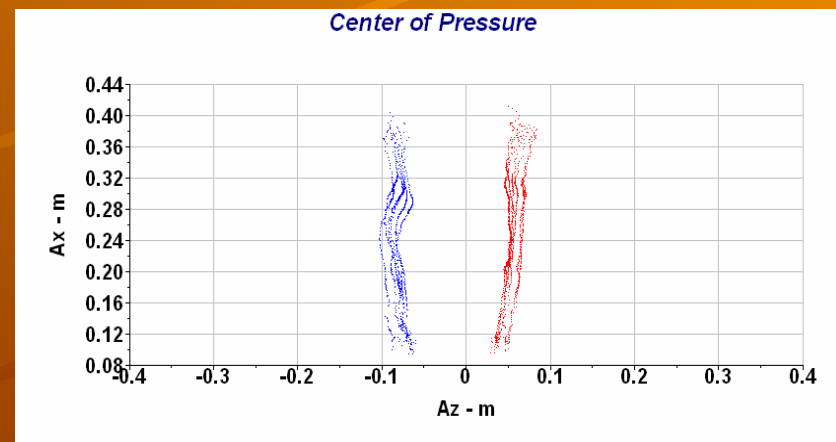
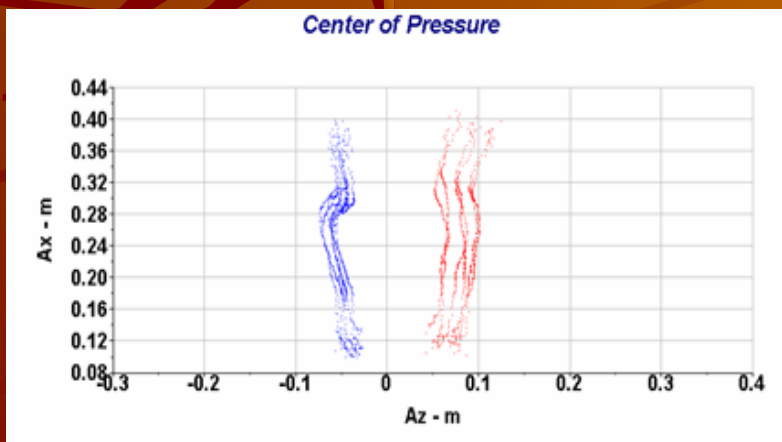
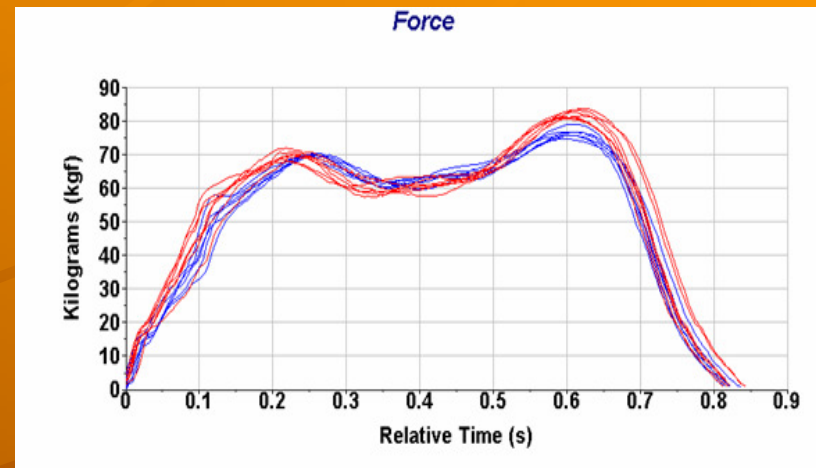
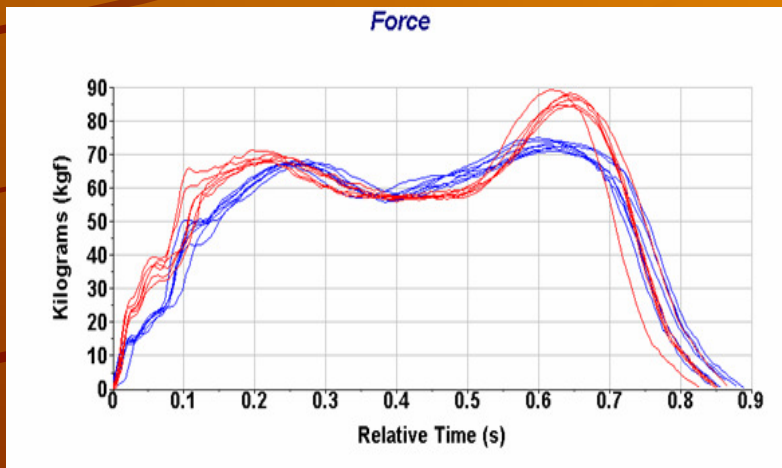
Rennen, barfuss 8 km/h

Beispiele aus der Praxis



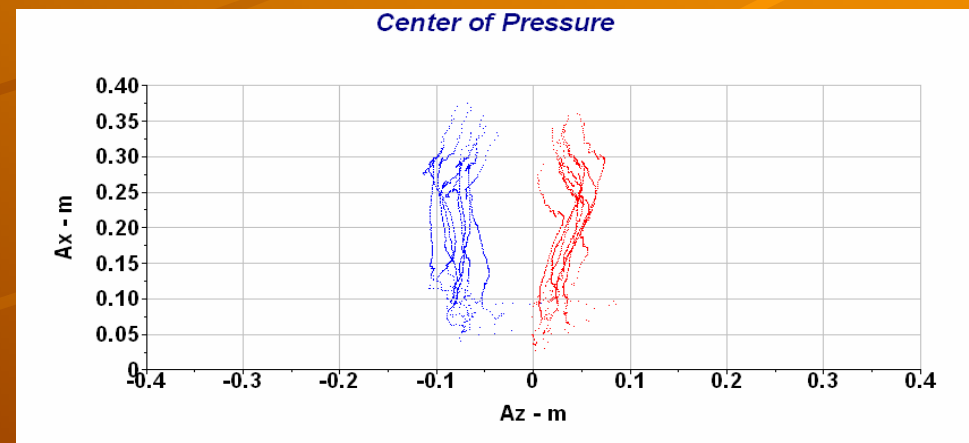
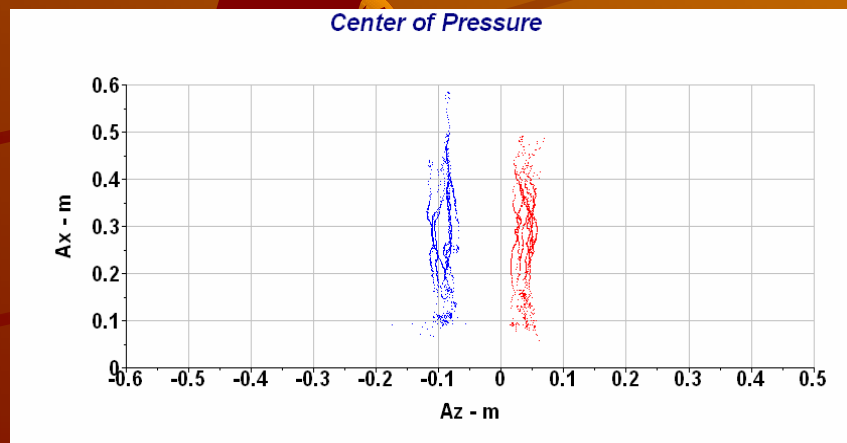
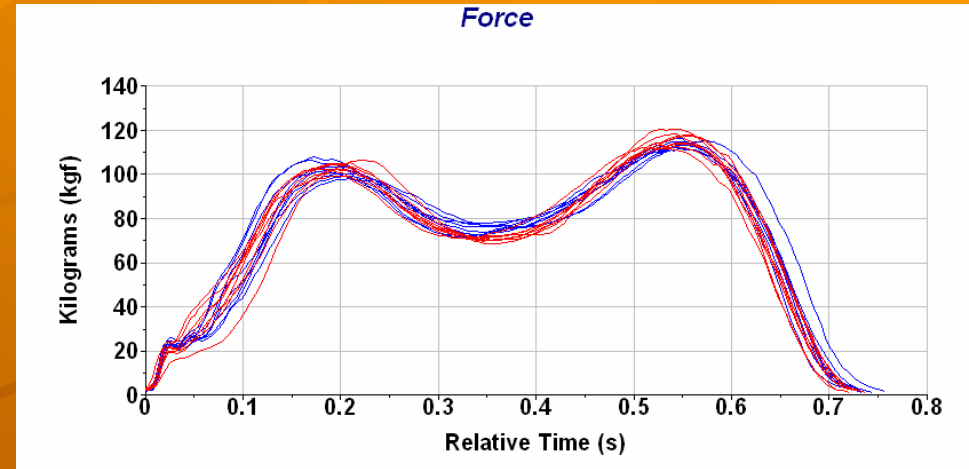
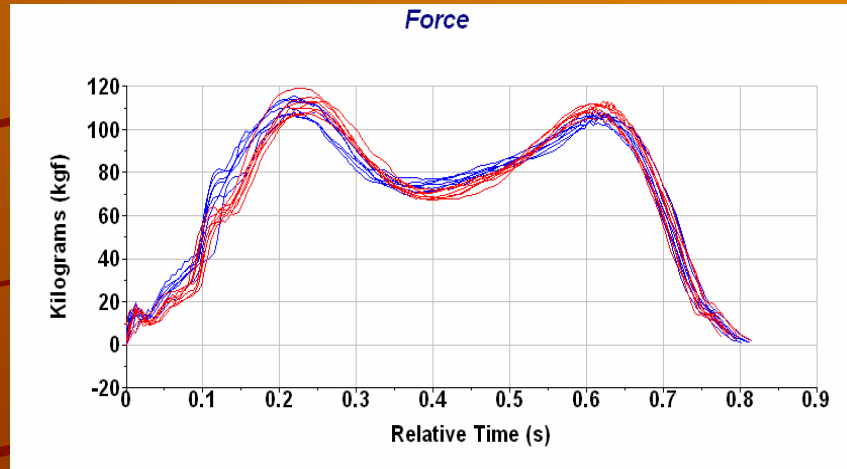
Arthrose des oberen Sprunggelenkes (links) & Femoropatellares Syndrom (rechts)

4 Wochen später



Fersensporn

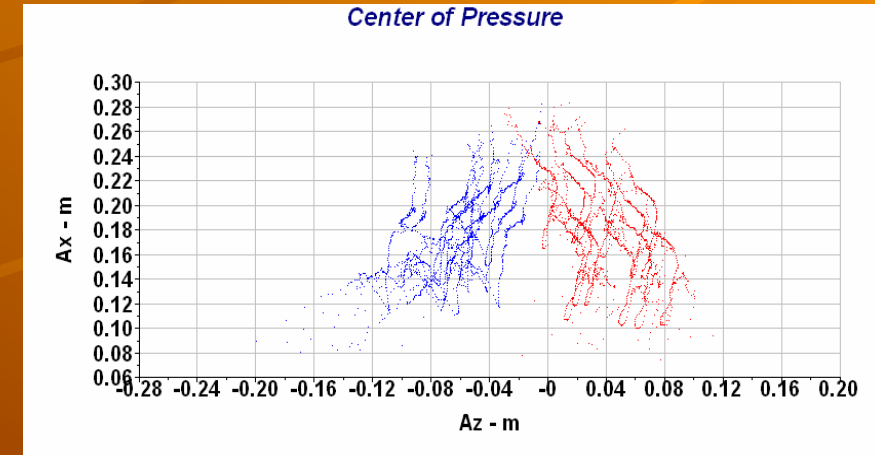
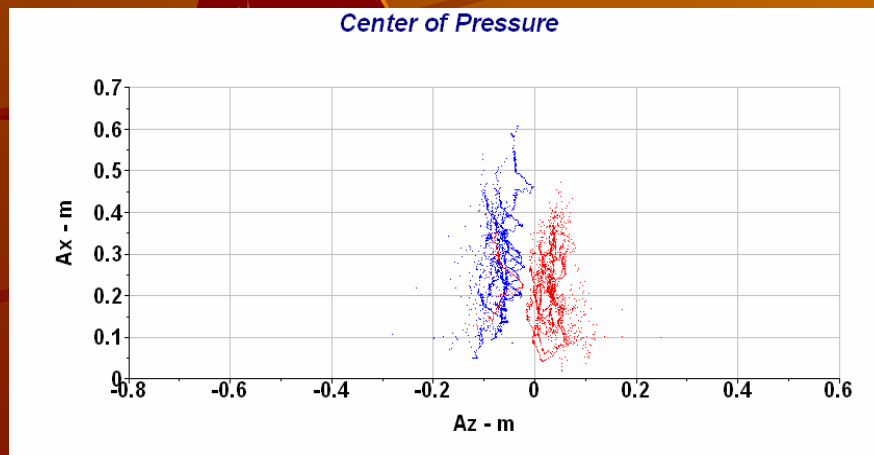
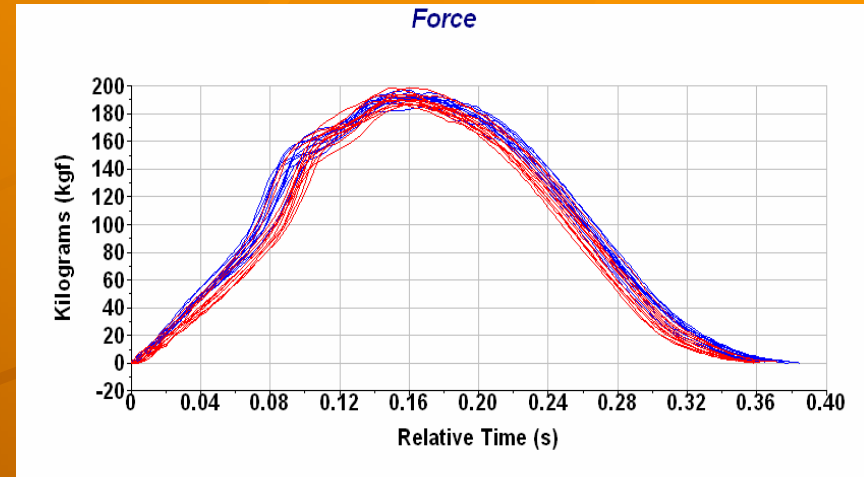
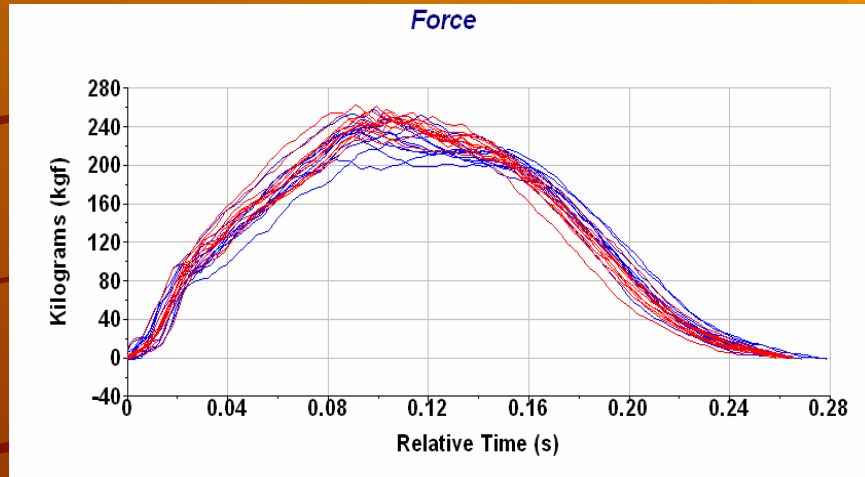
8 Wochen später



Gehen

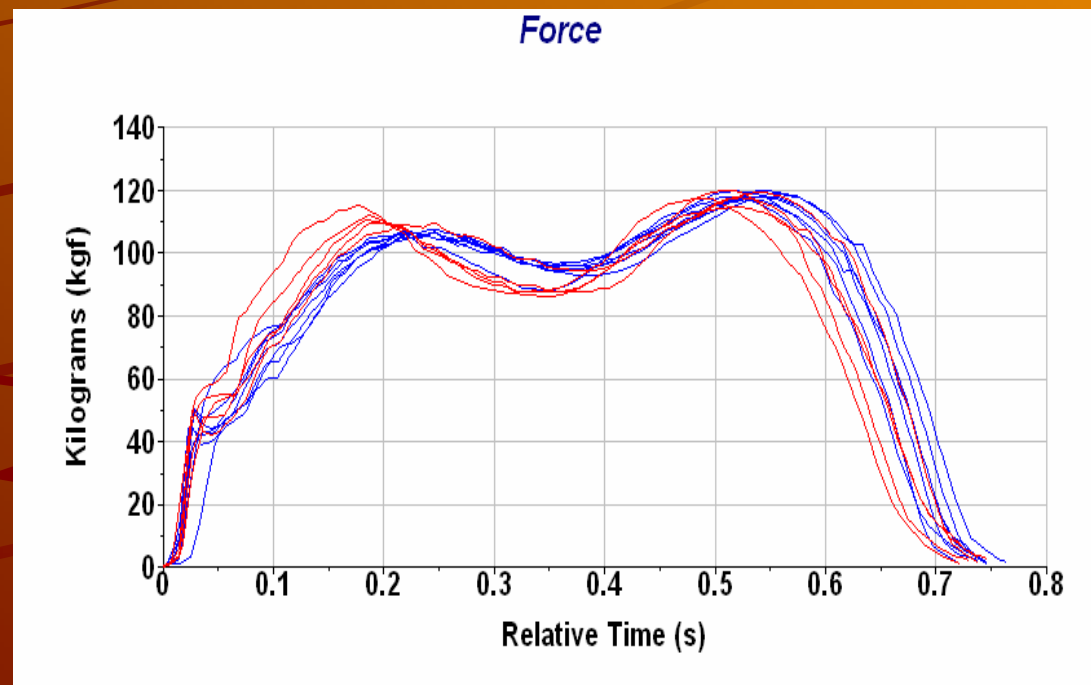
Fersensporn

10 Wochen später



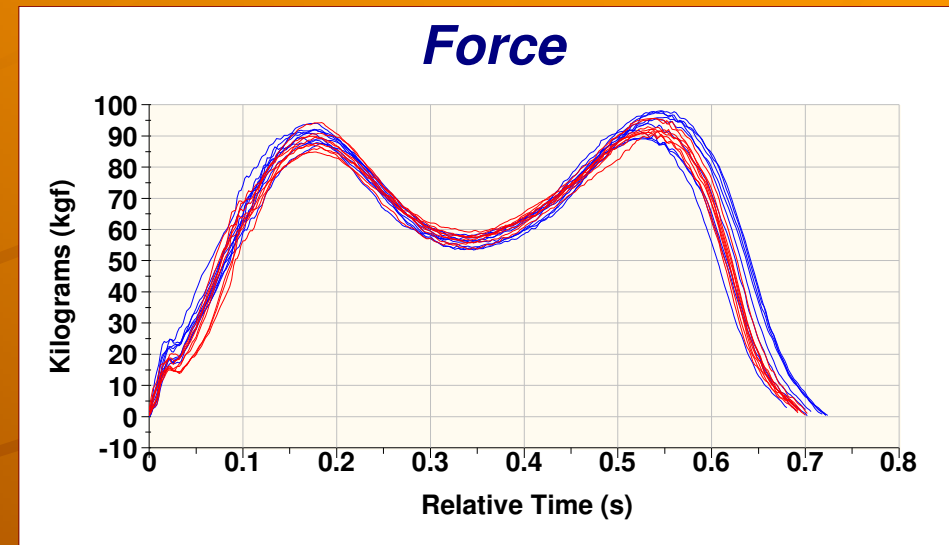
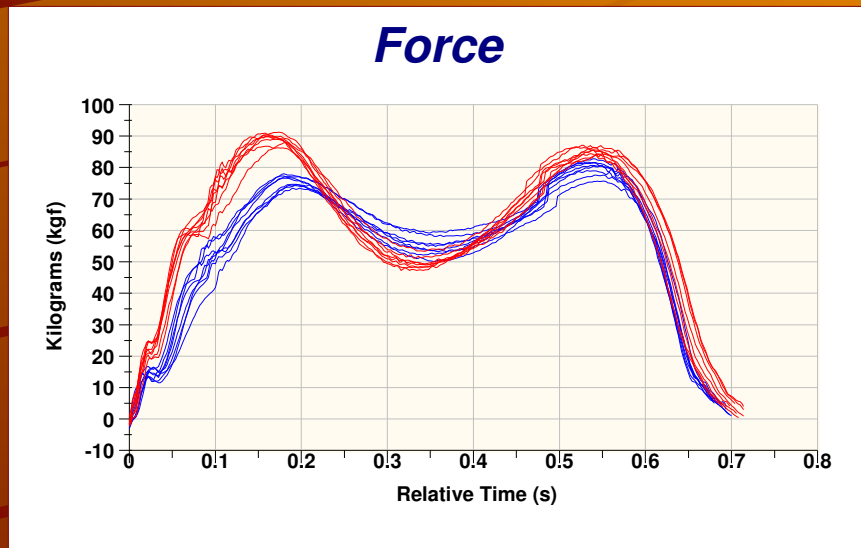
Rennen

Tendovaginitis Tibialis posterior, Flexor hallucis longus und Flexor digitorum longus



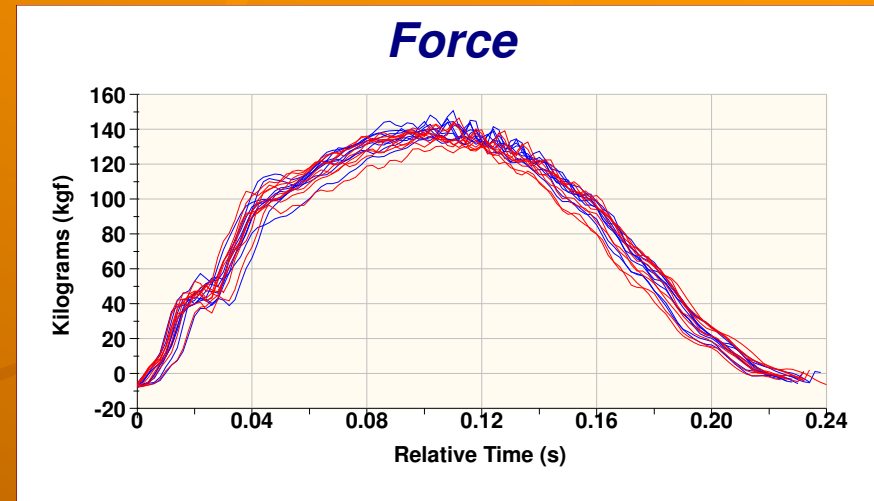
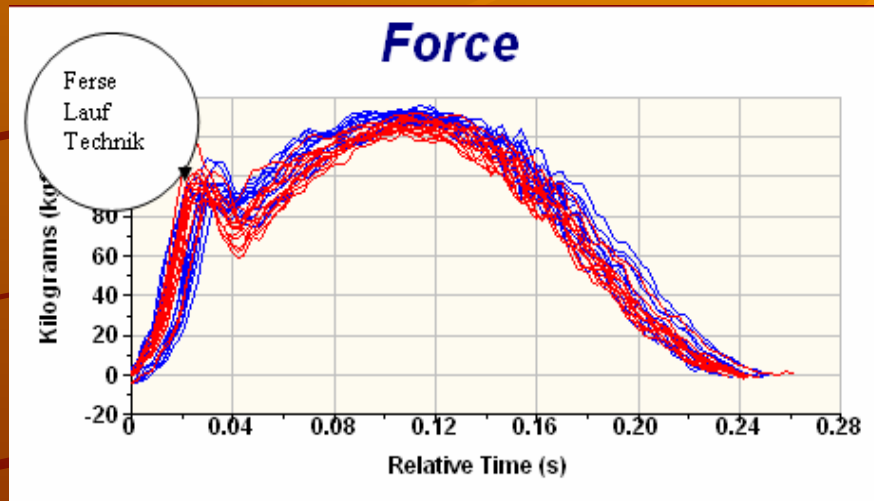
Jumpers Knie links

21 Tage später

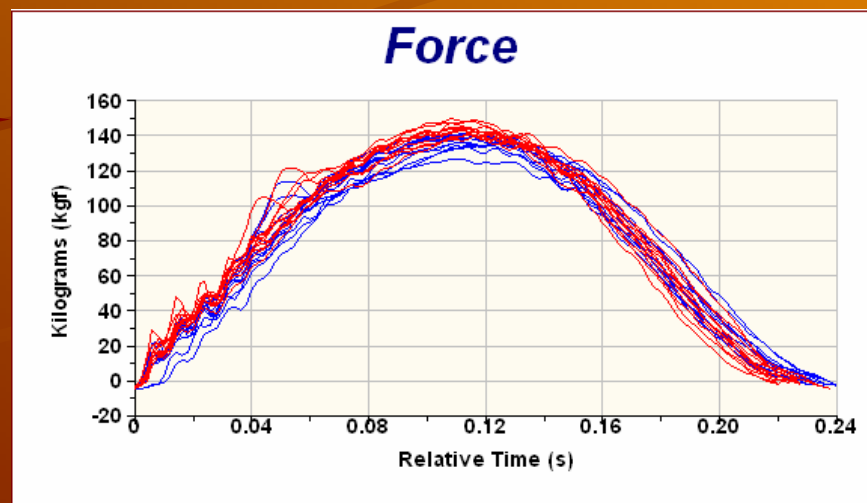


“ Läuferknie “

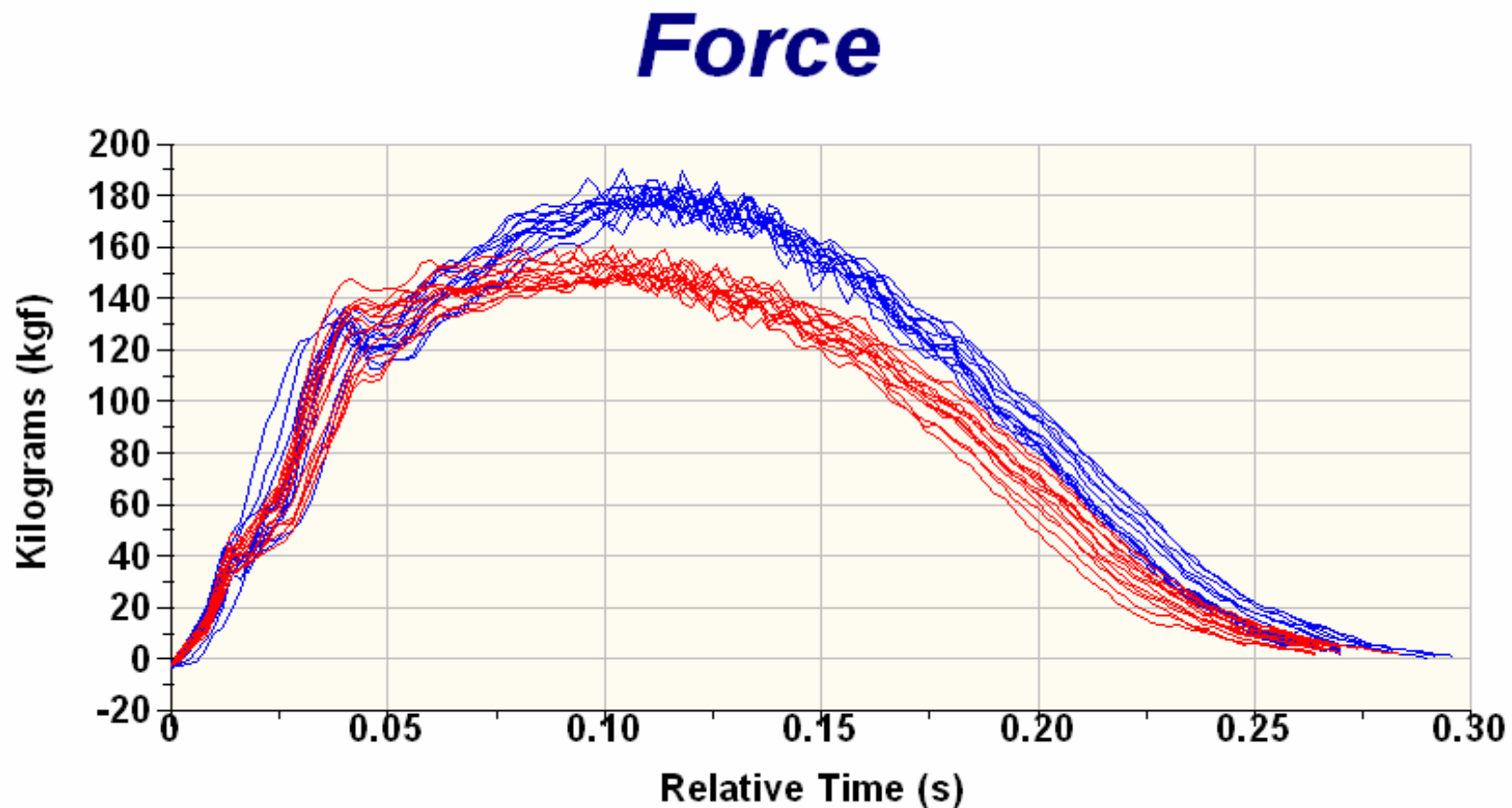
Laufschuhe



Barfuss

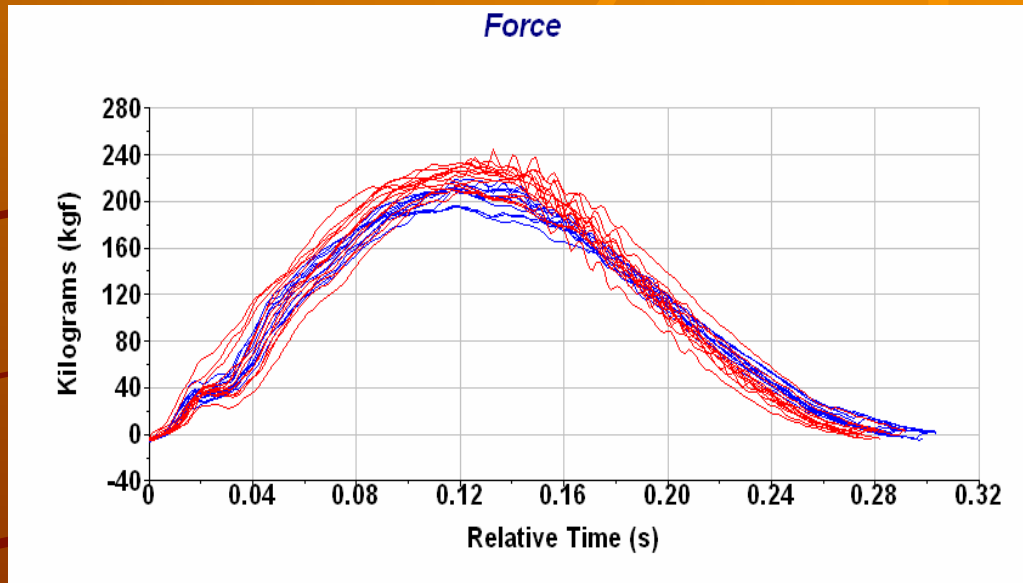


VKB Plastik rechts



2 Jahre nach der Operation

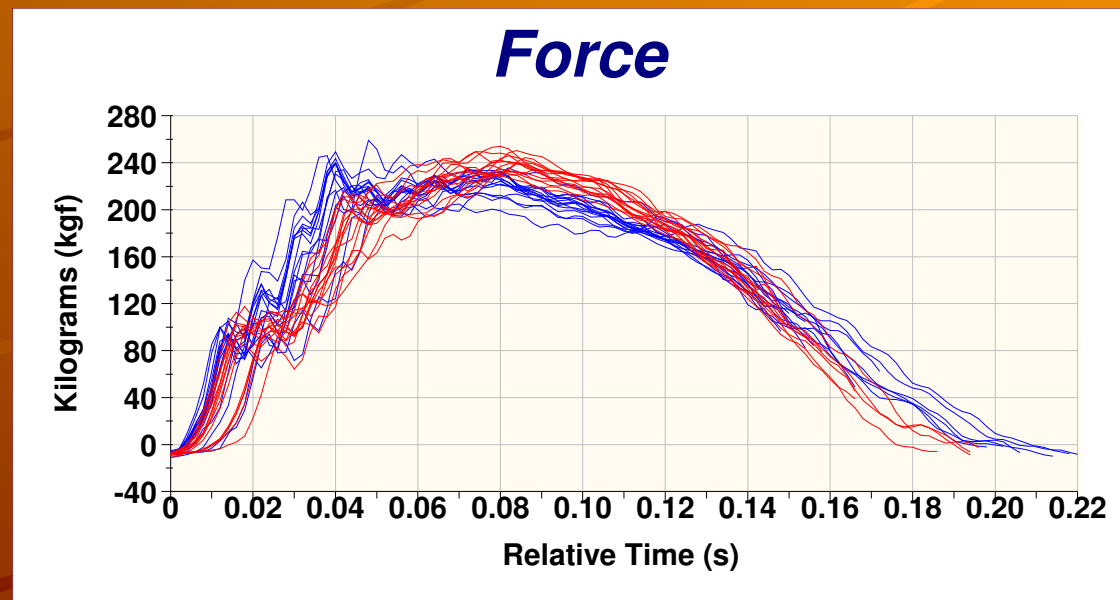
Mehrere OP li Knie



8 km/h

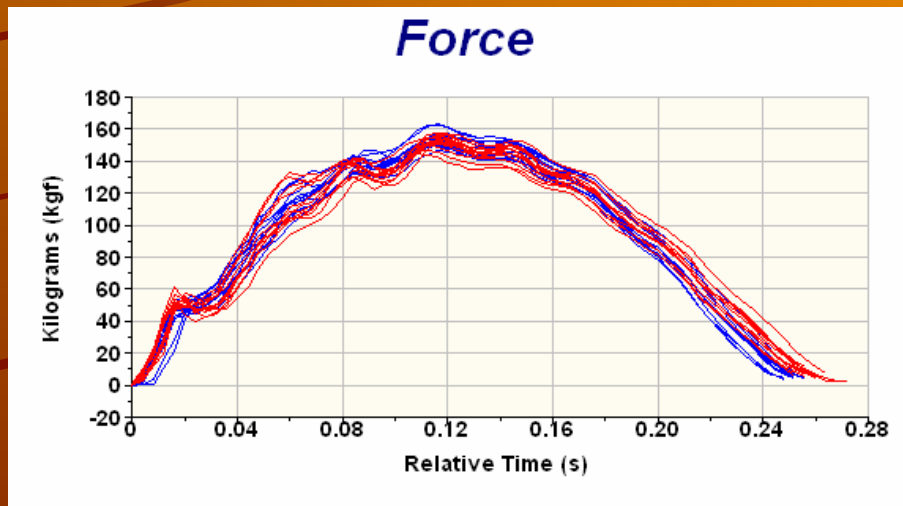


13 km/h

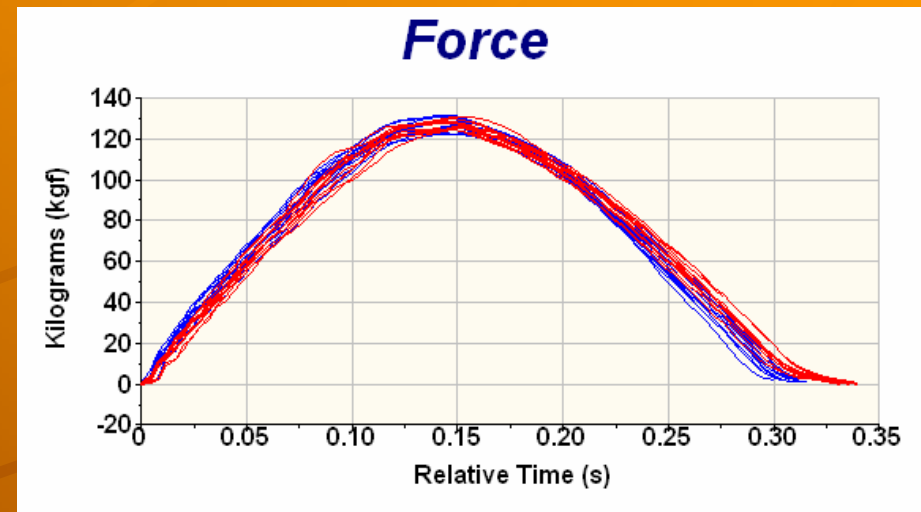


Knieschmerzen li > re nach 10 Min. Rennen mit Fersenrenntechnik

Vorfussrenntechnik



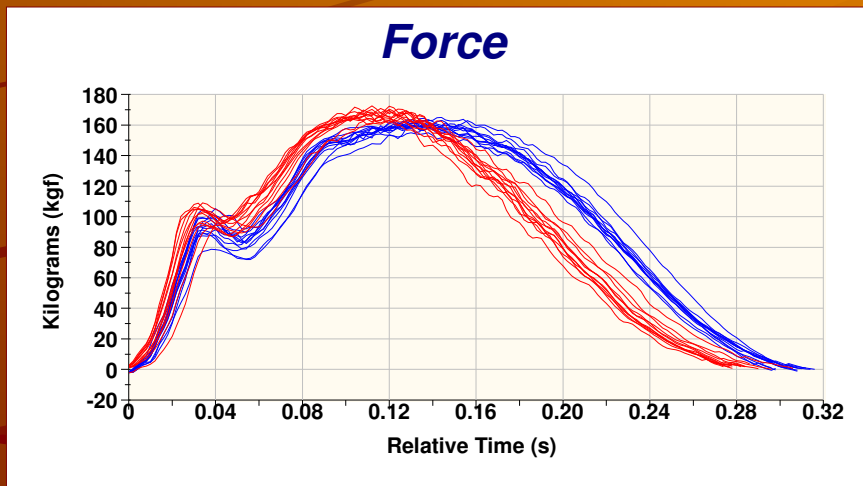
Mit Rennschuhen



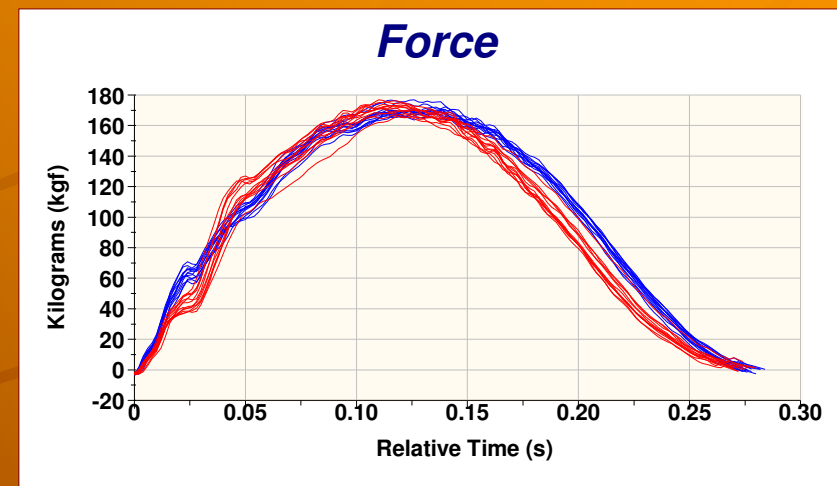
Barfuss



Gonarthrose rechts

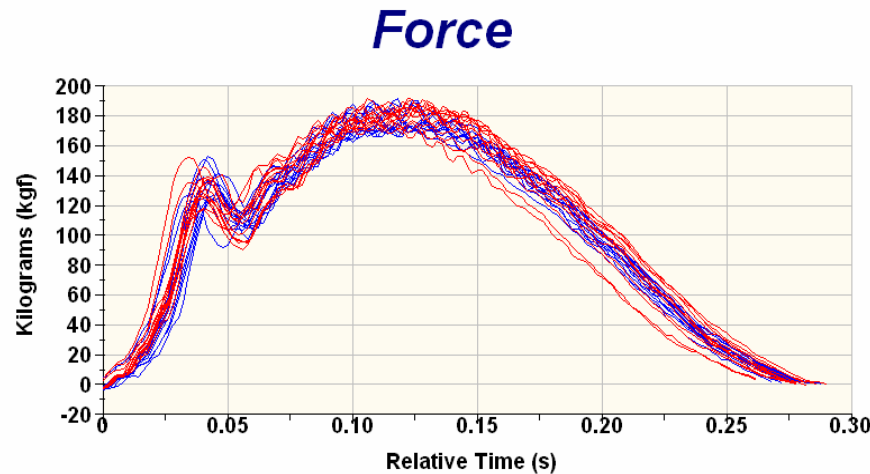


Fersenrenntechnik



Vorfussrenntechnik

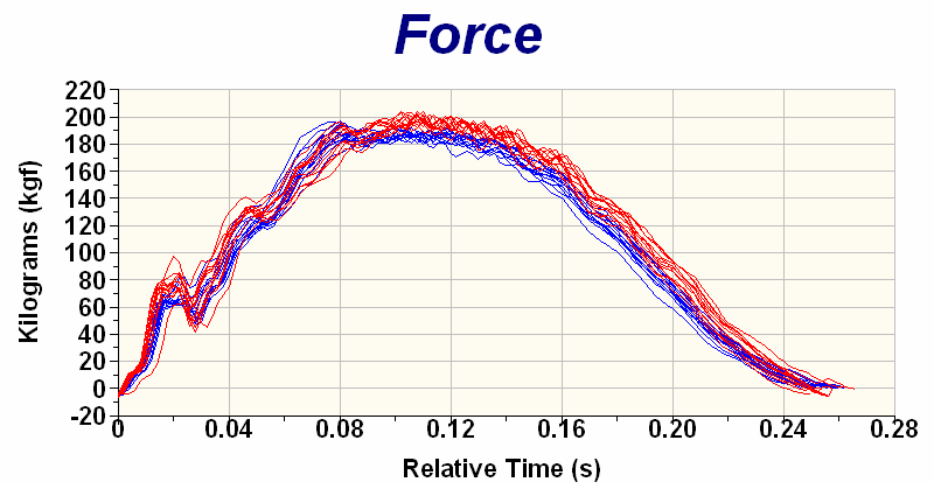
Patellae Trümmerfraktur



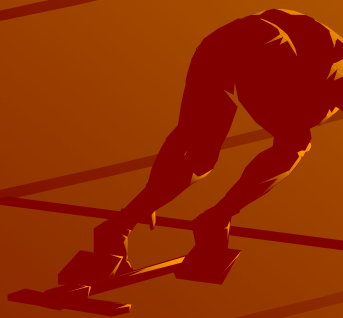
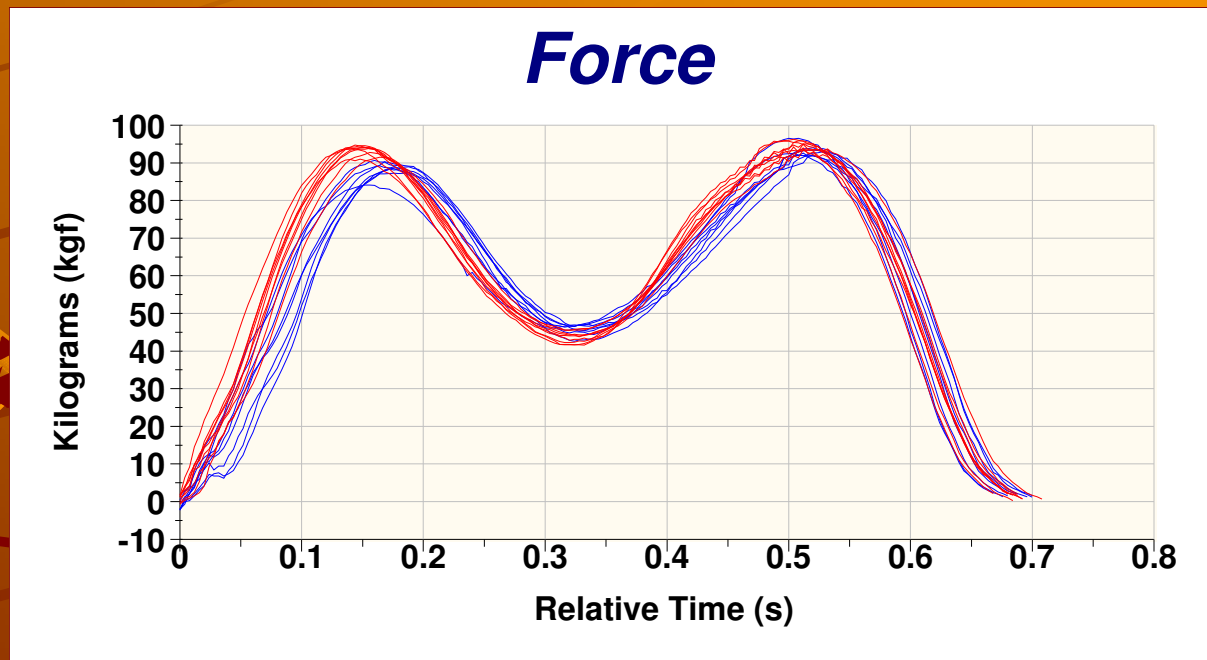
Fersenrenntechnik



Vorfussrenntechnik

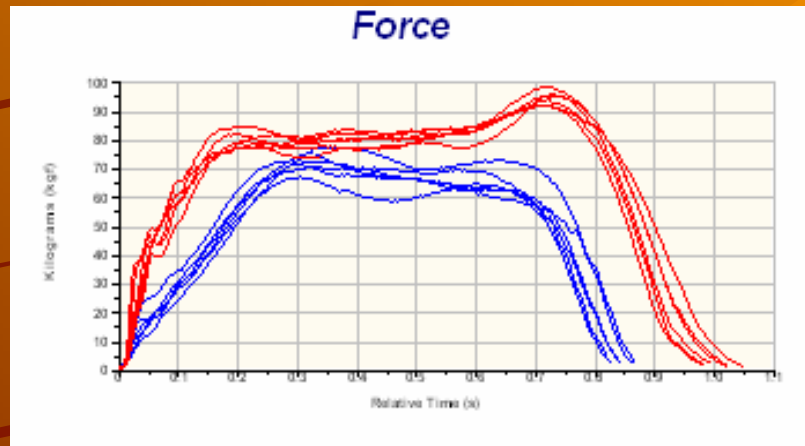


Total Prothese li Knie

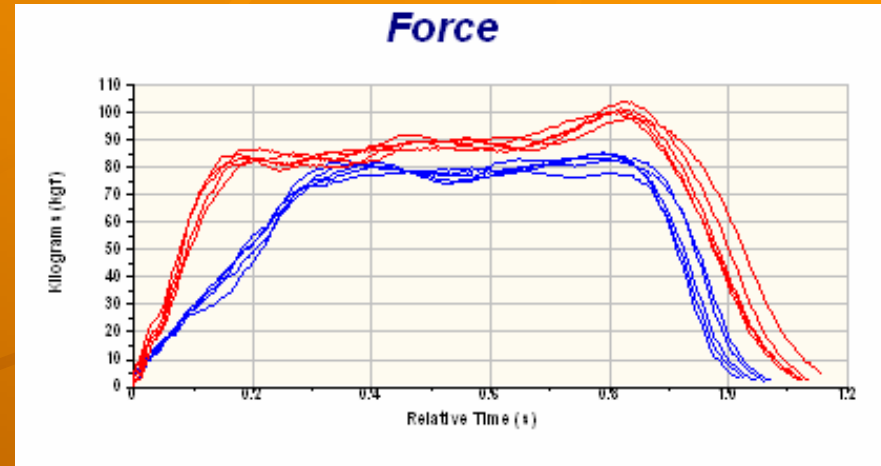


VKB Plastik

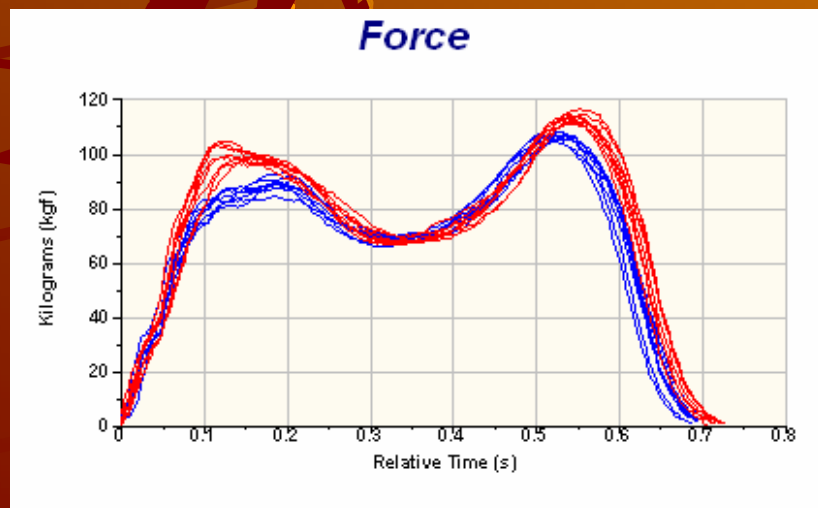
3 Wochen nach OP



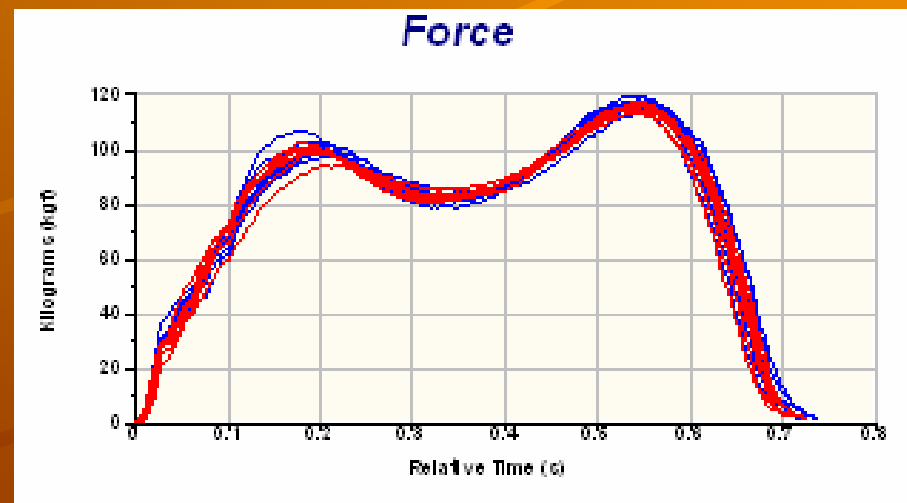
6 Wochen nach OP



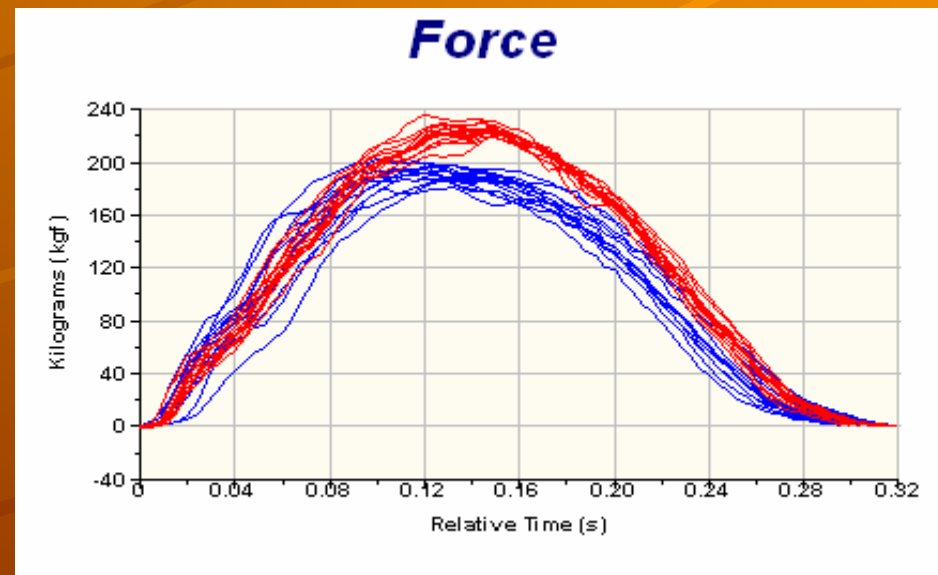
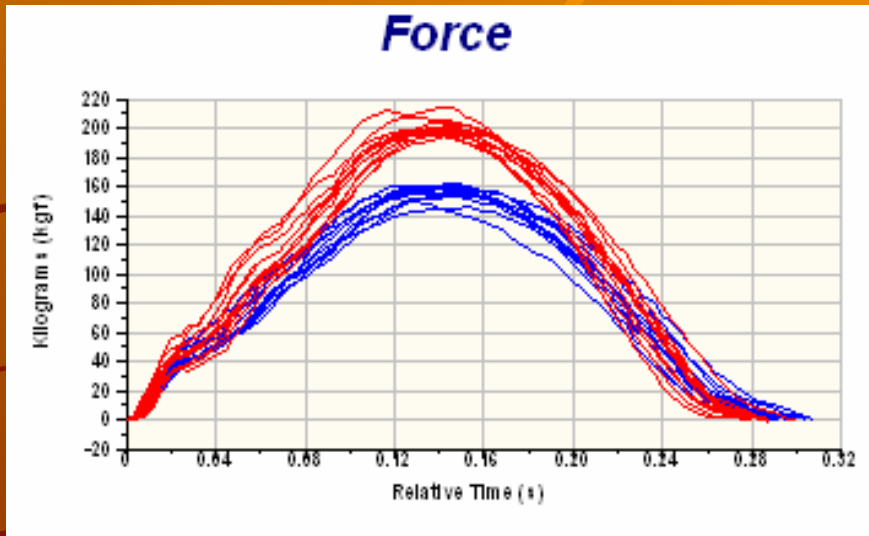
8 Wochen nach OP



12 Wochen nach OP

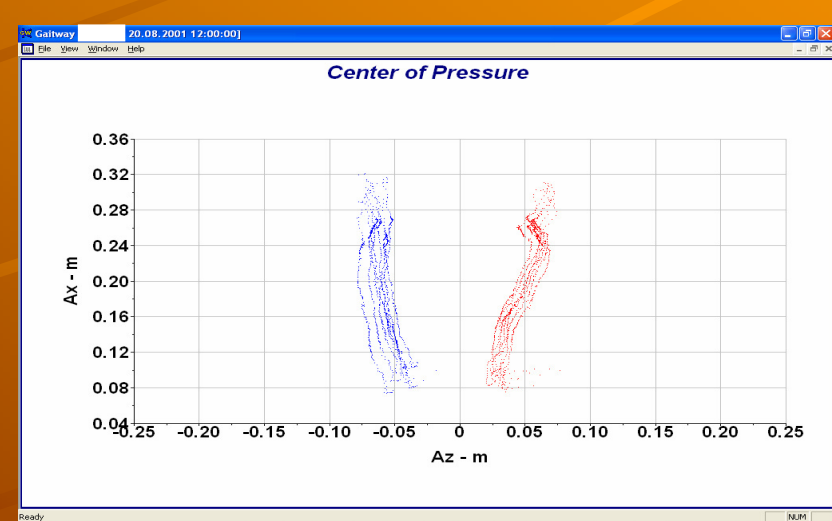
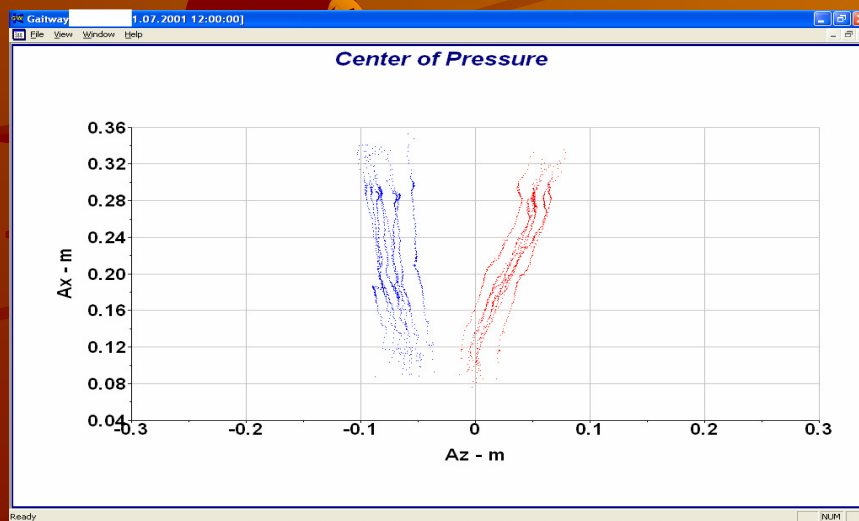
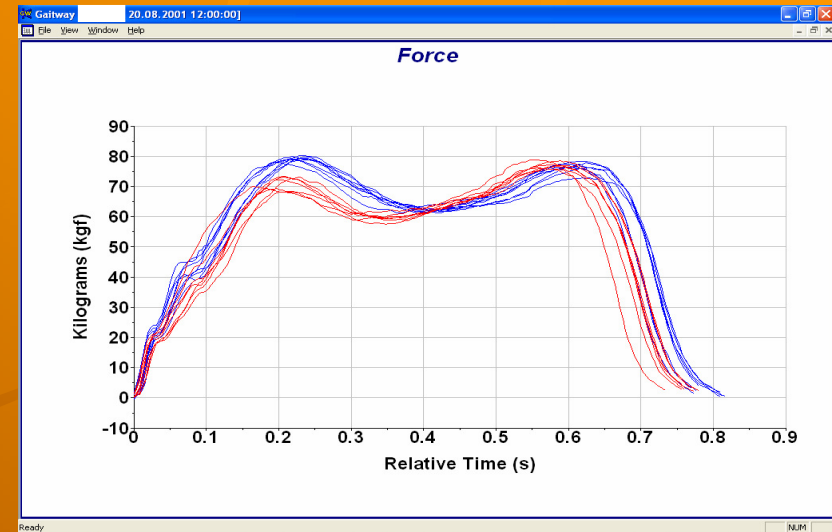
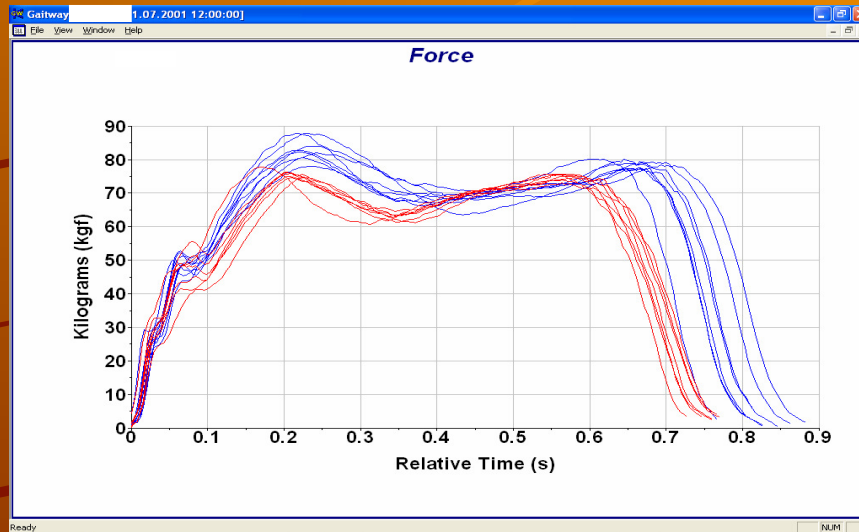


Rennen nach 12 und 14 Wochen



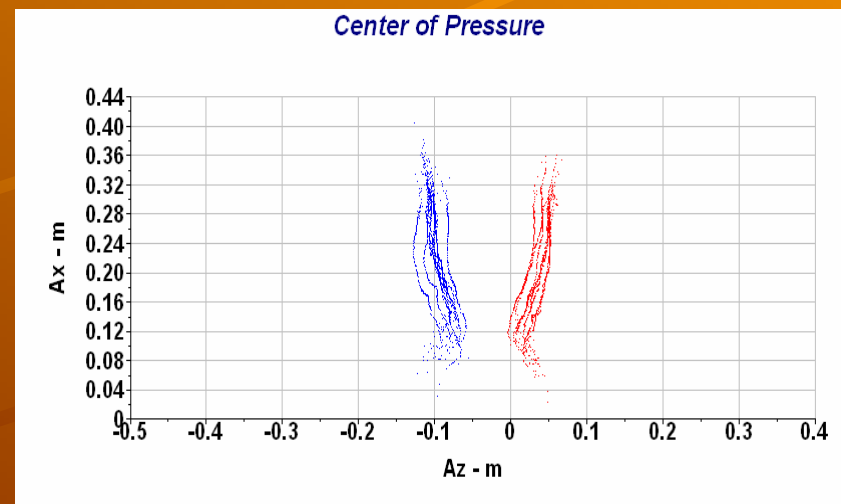
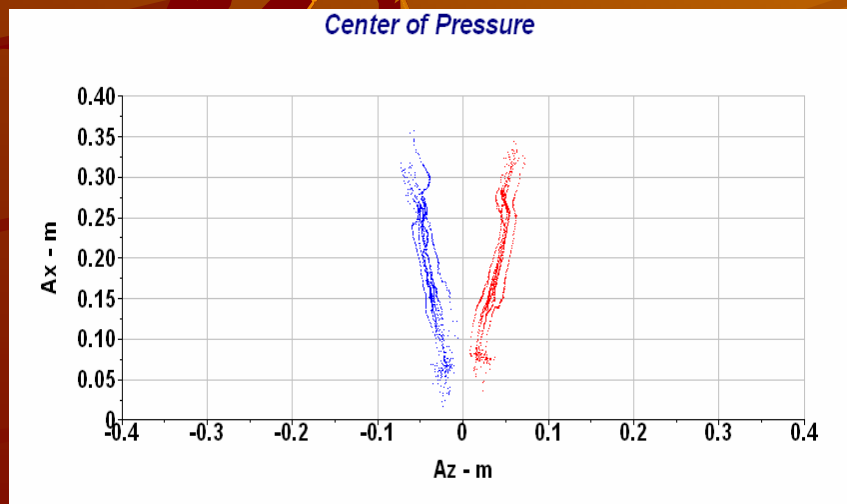
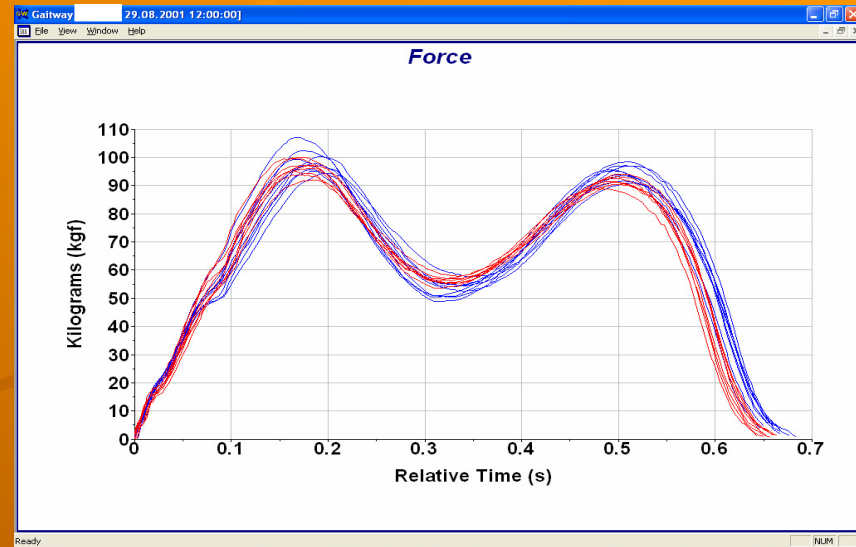
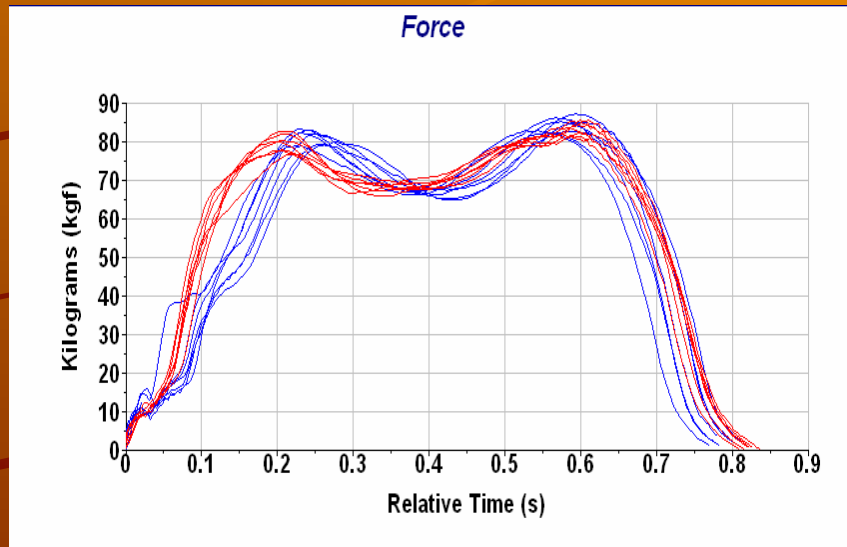
Femoropatellares Syndrom

8 Wochen später

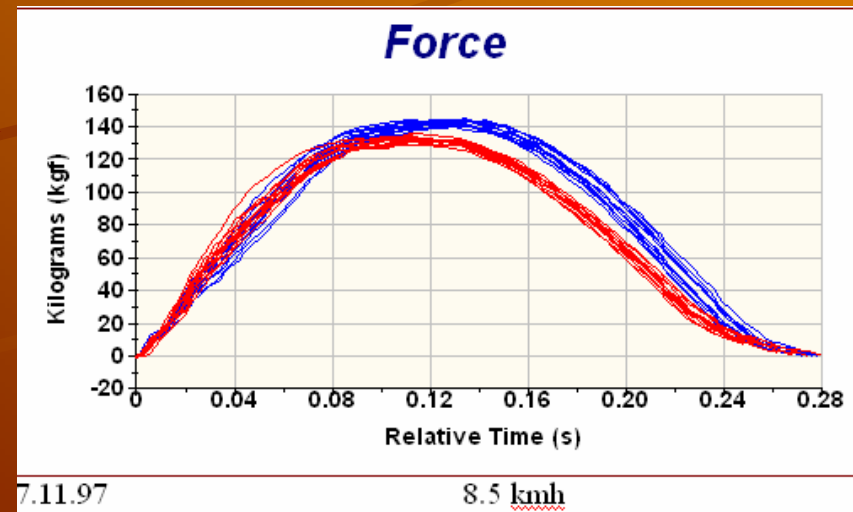
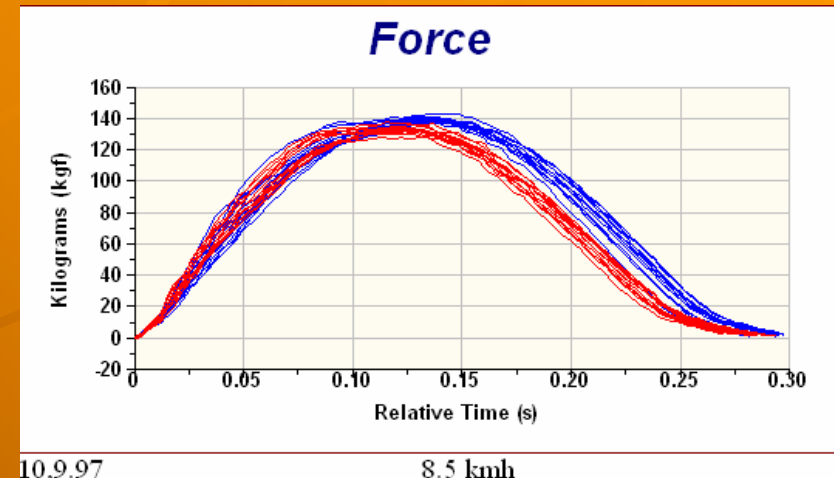
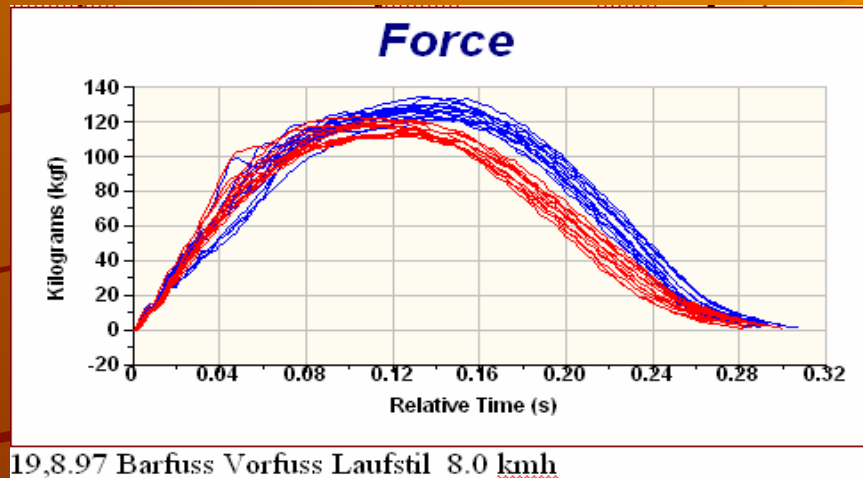


Gonarthrose

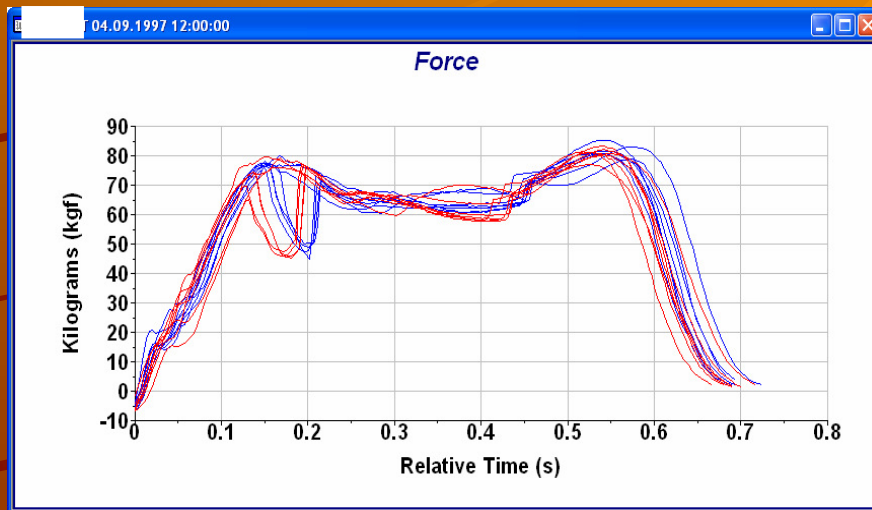
3 Monate später



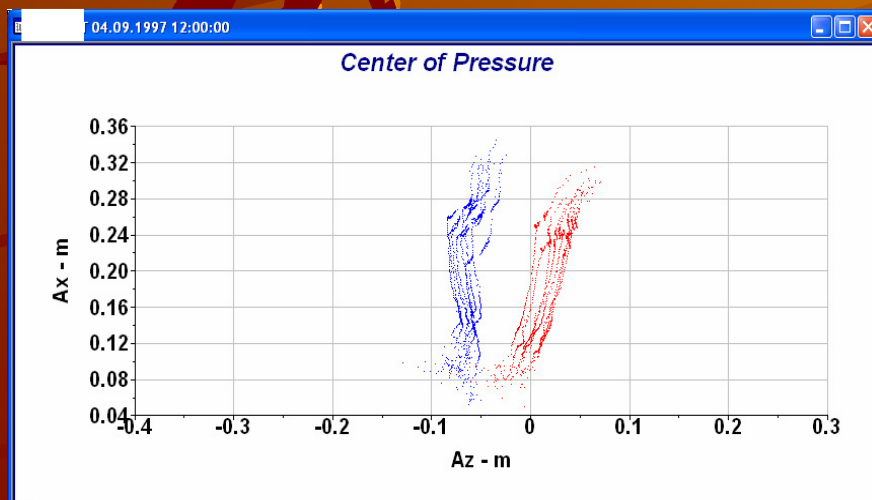
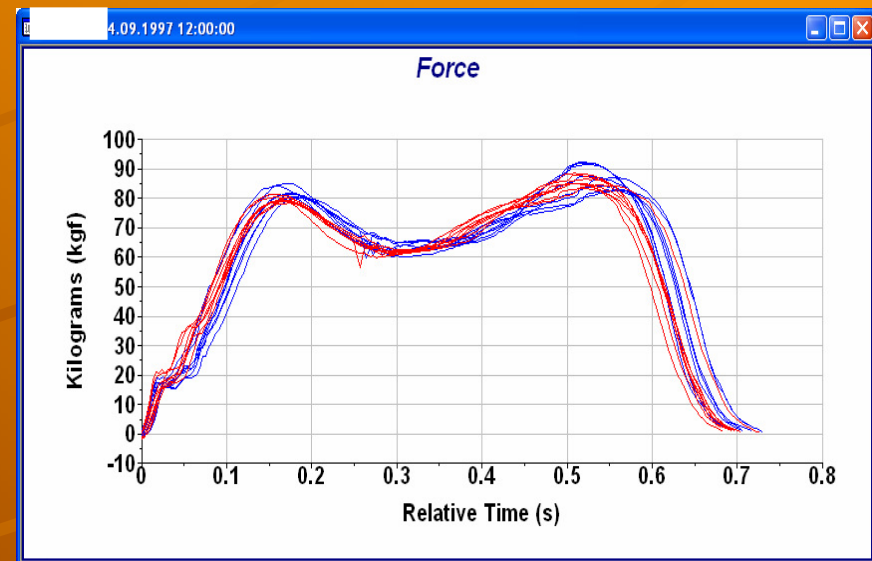
VKB Plastik, Tibiakopf Synthese, Metallentfernung



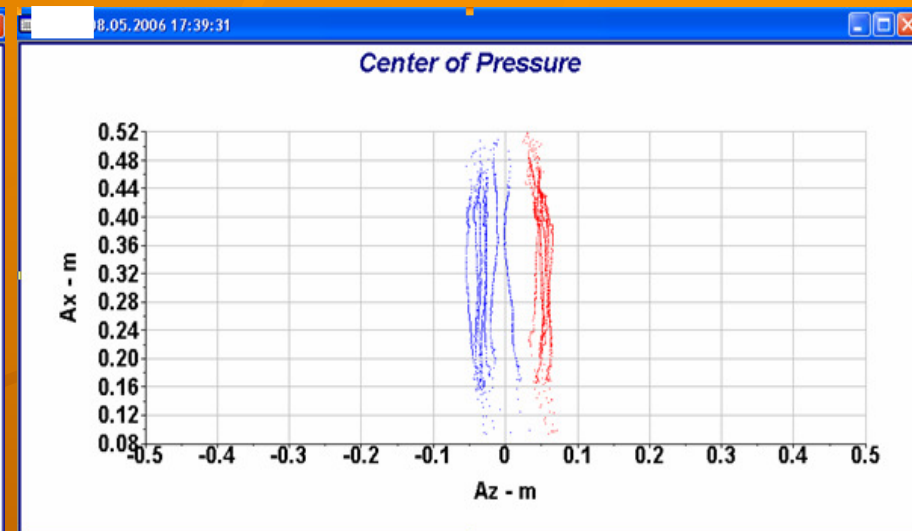
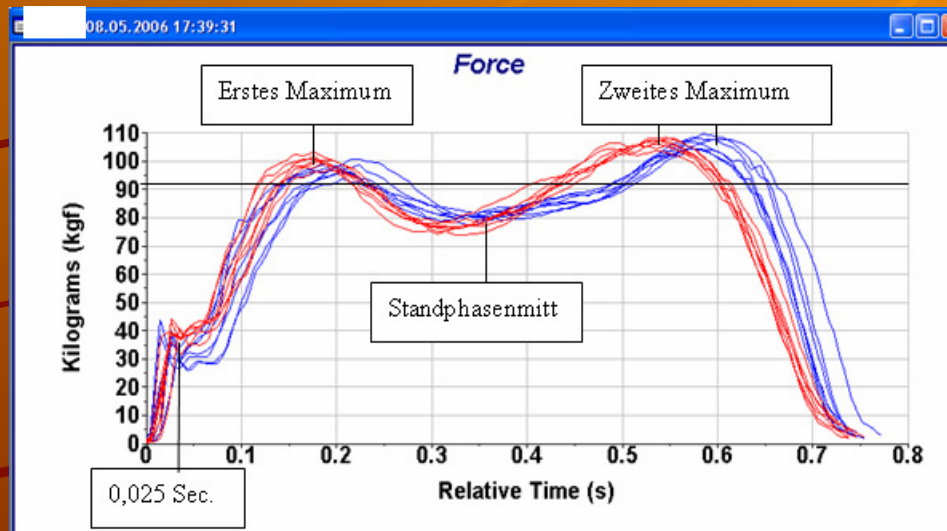
Coxarthrose bds



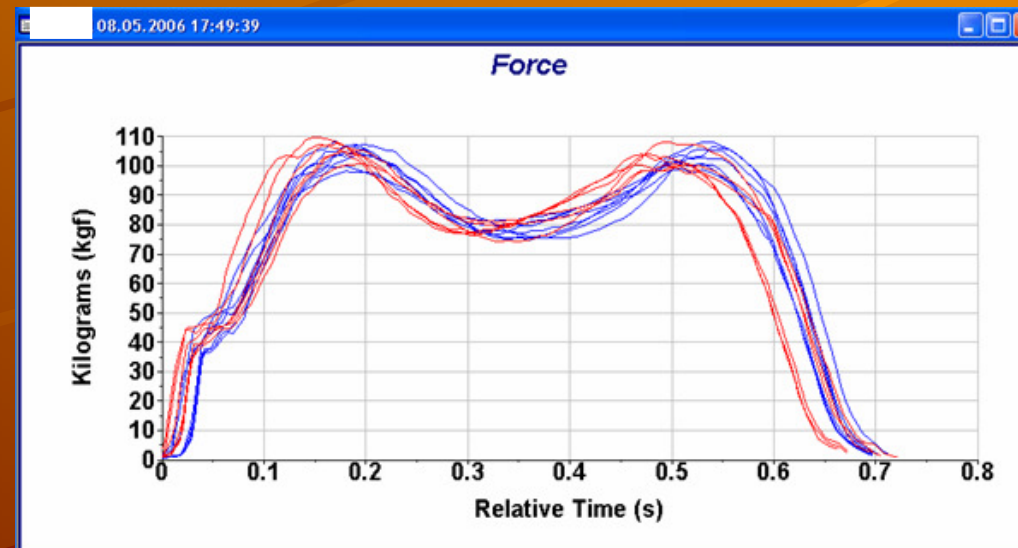
20 Min. nach gezielten Übungen



Femoroacetabuläres Impingement Syndrom re St. nach arthroskopischer OP

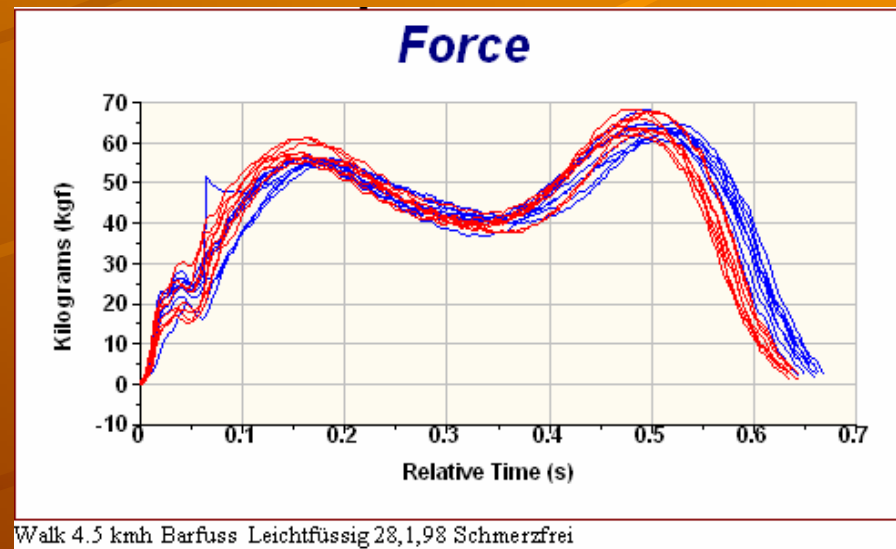
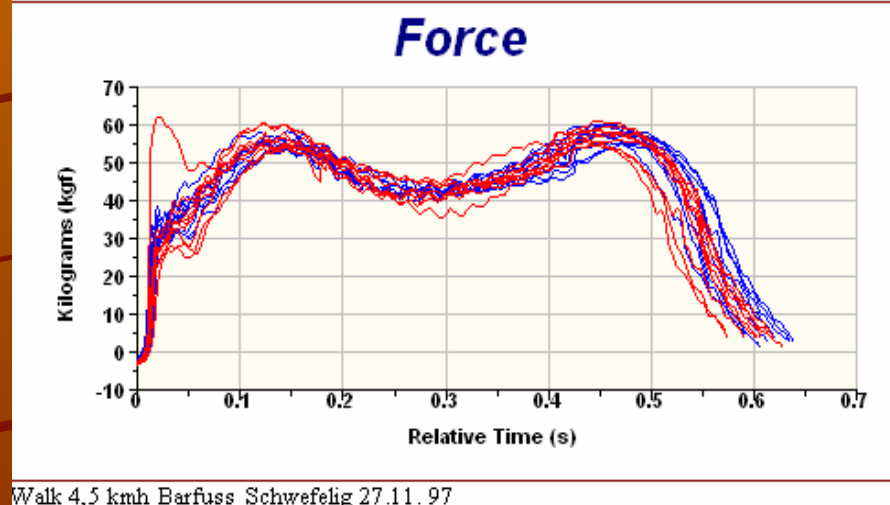


Nach Verbesserung
der Gehtechnik



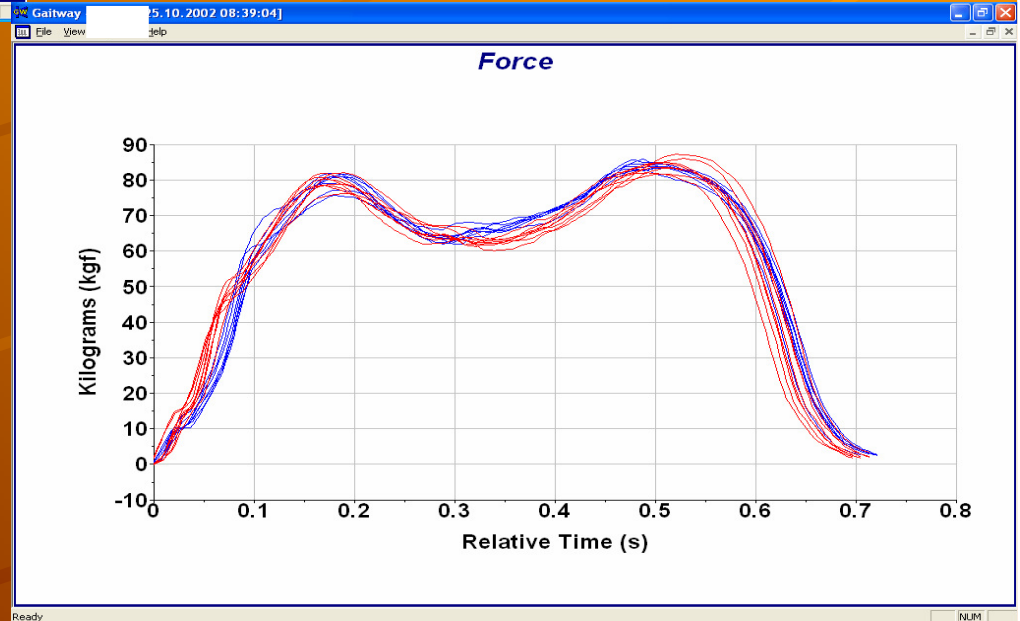
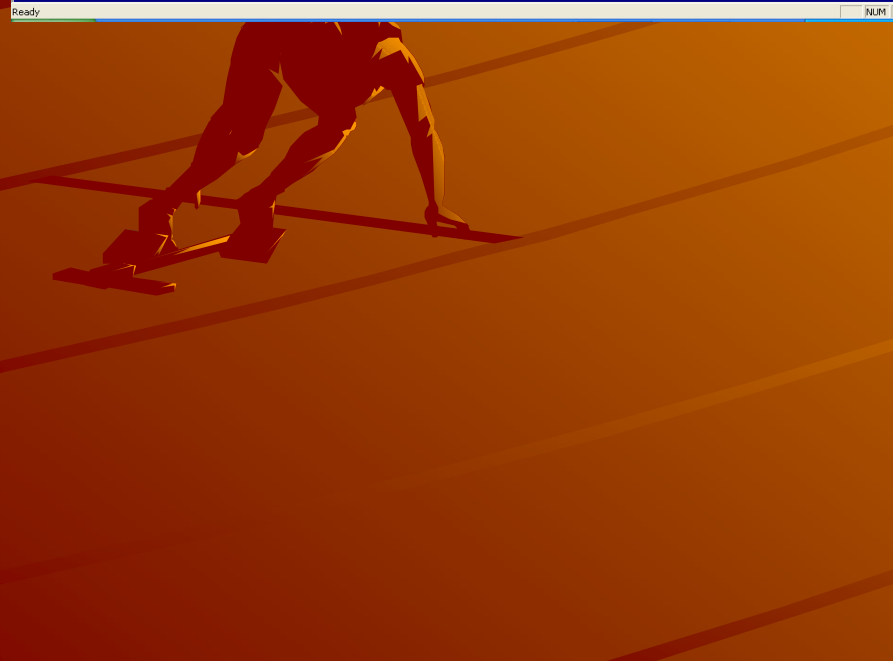
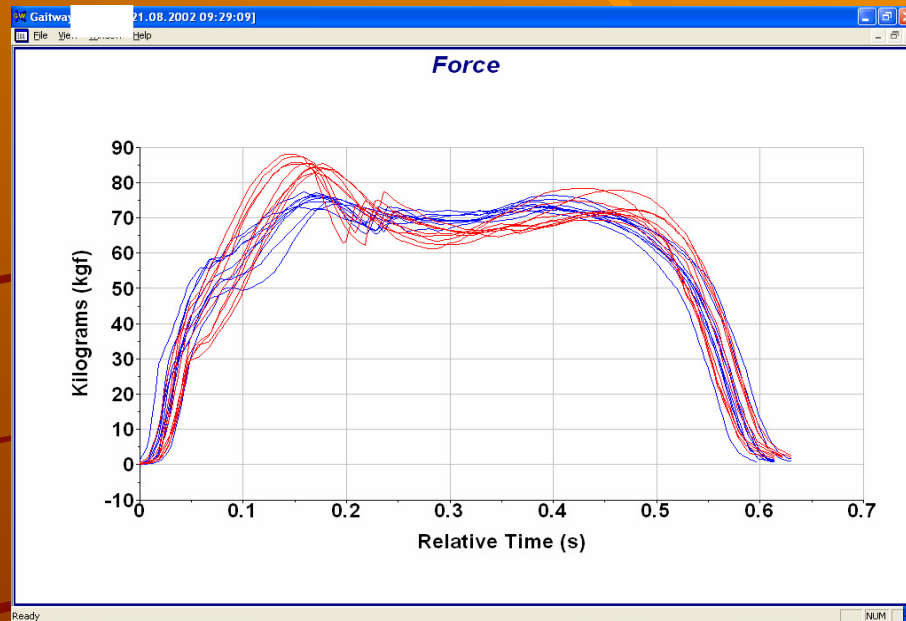
Hüftschmerzen bds

Fr. B. A.

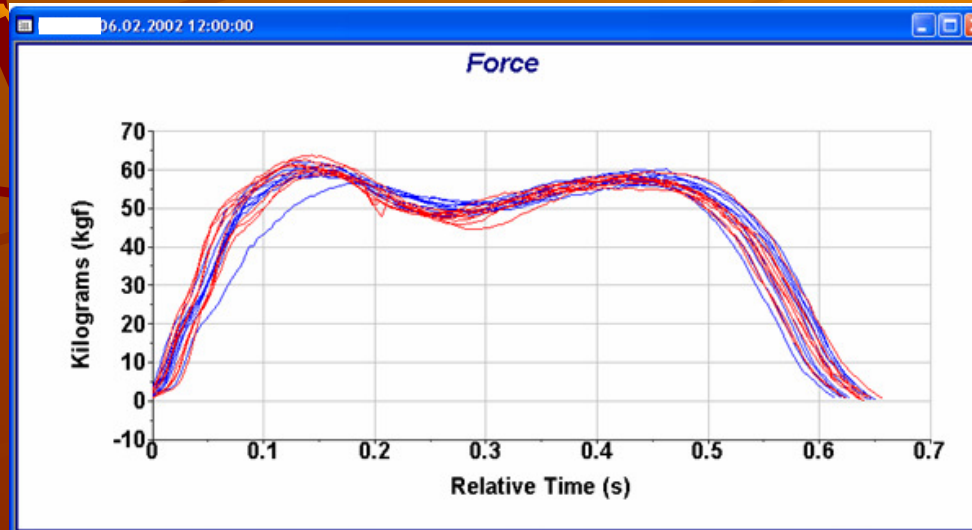
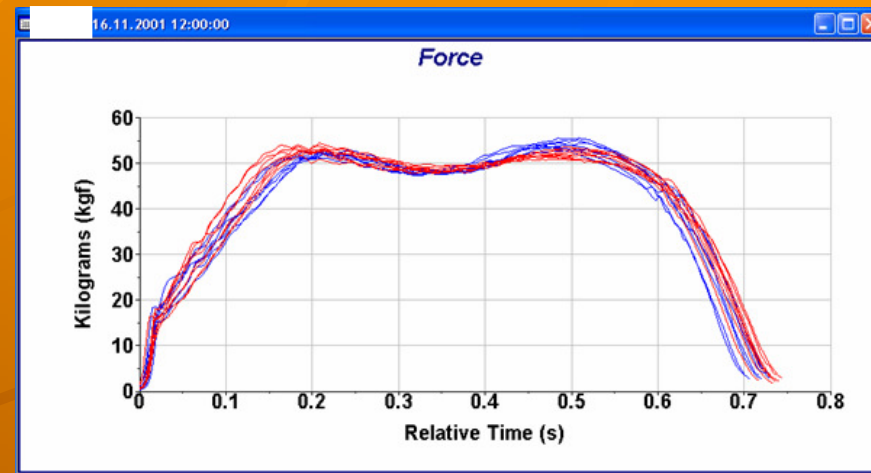
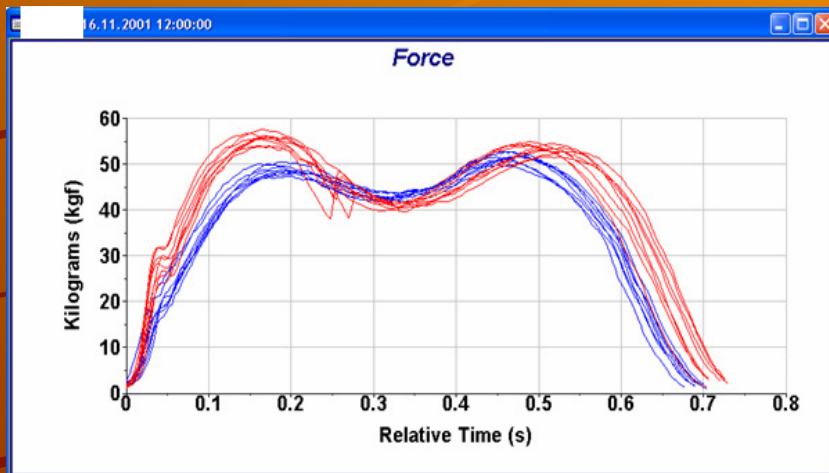


ISG Blockierungen

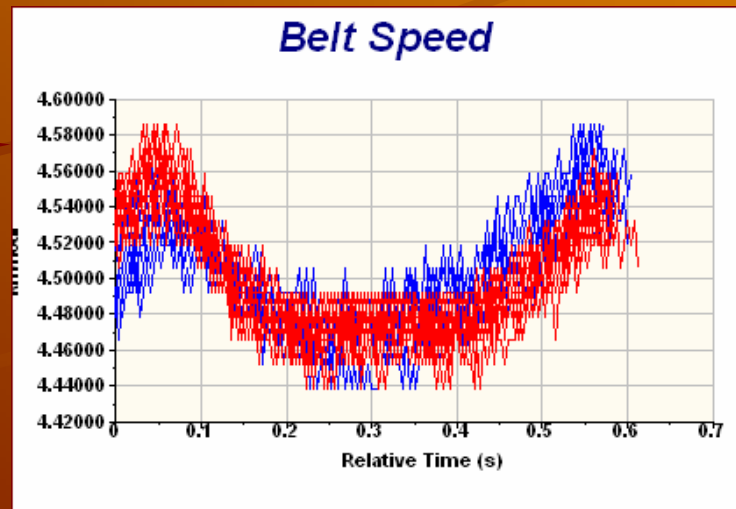
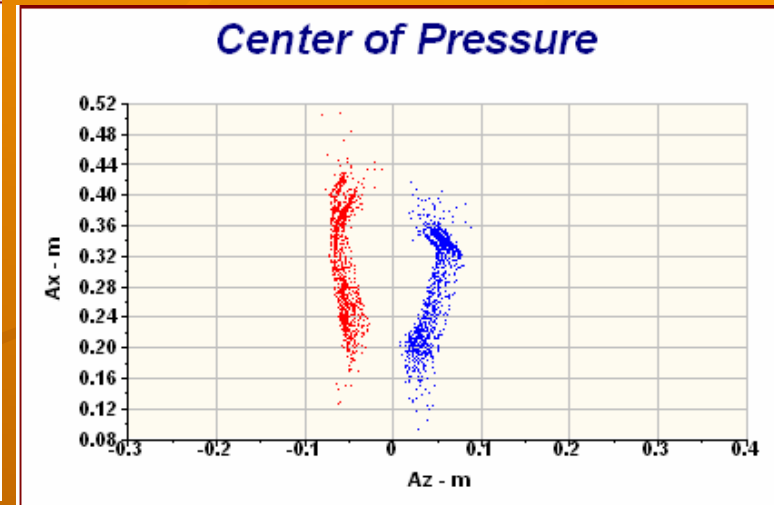
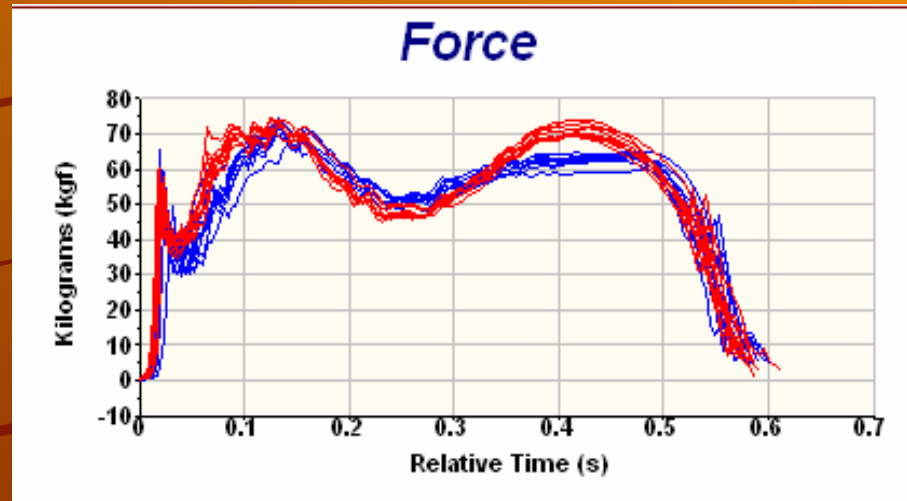
6 Wochen nach
gezieltem Training



Blockiertes ISG auf OP Seite

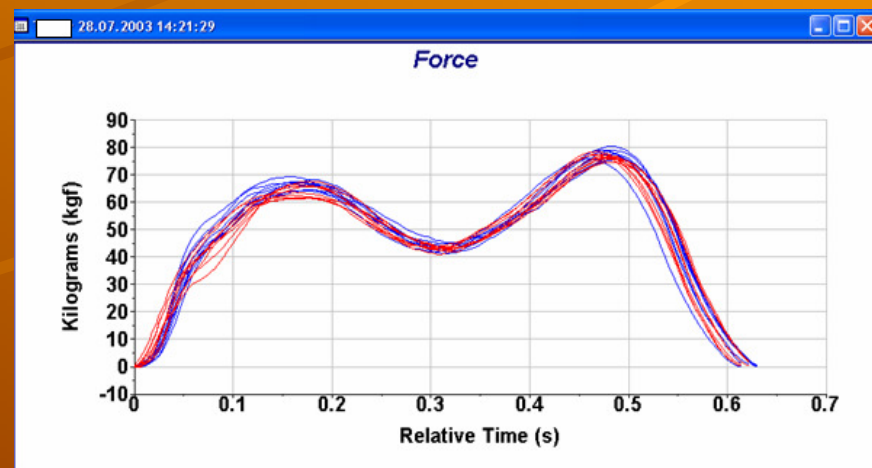
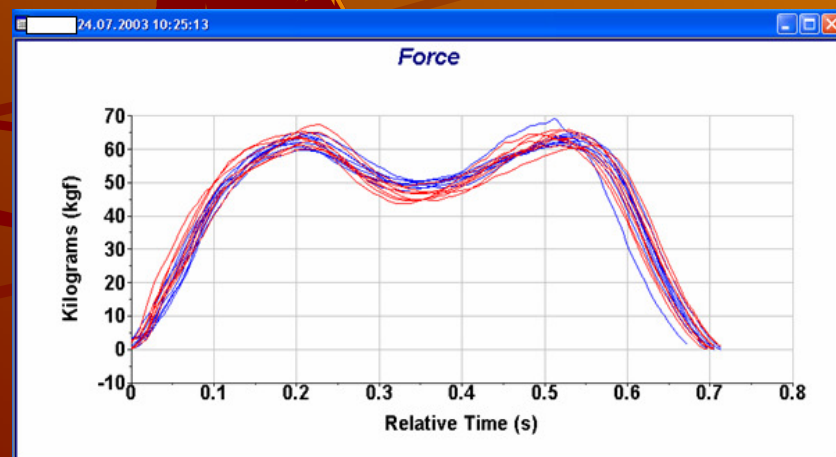
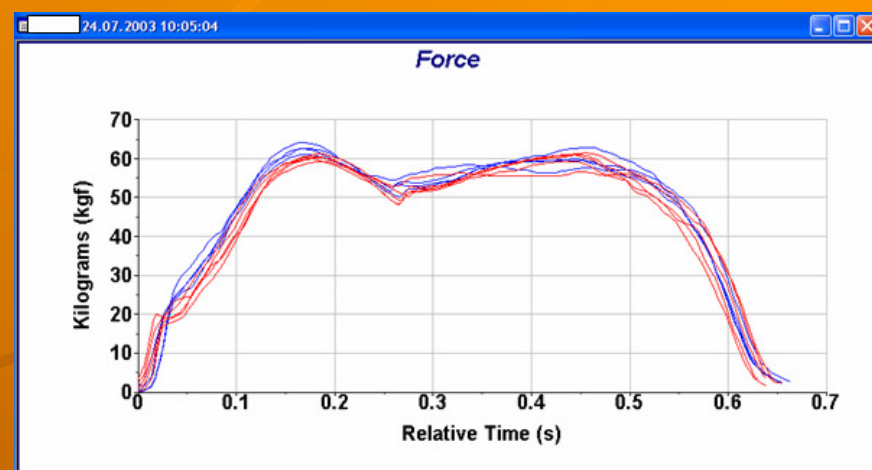
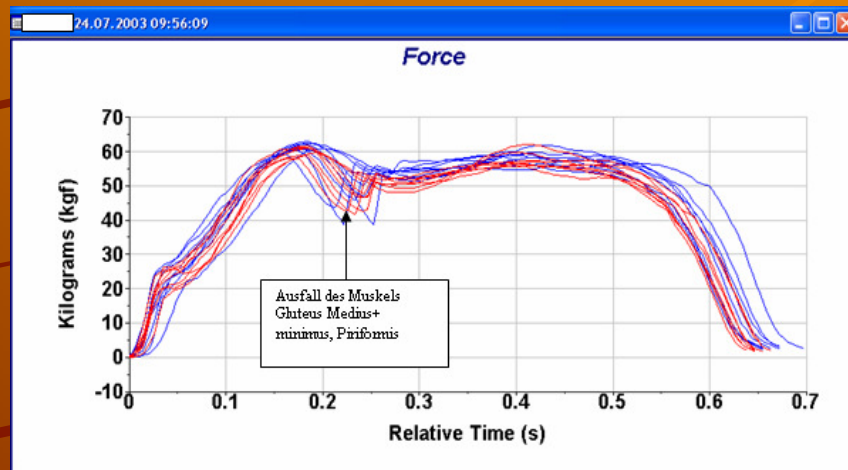


Adduktorenzerrung re; ISG Blockierung re



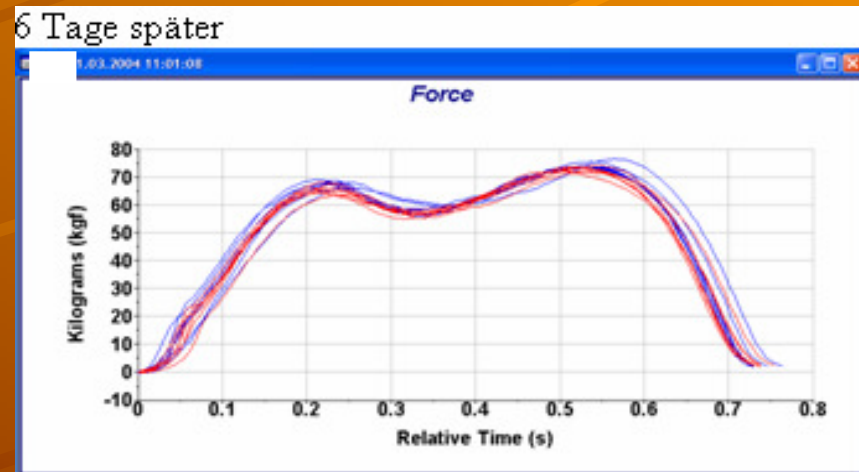
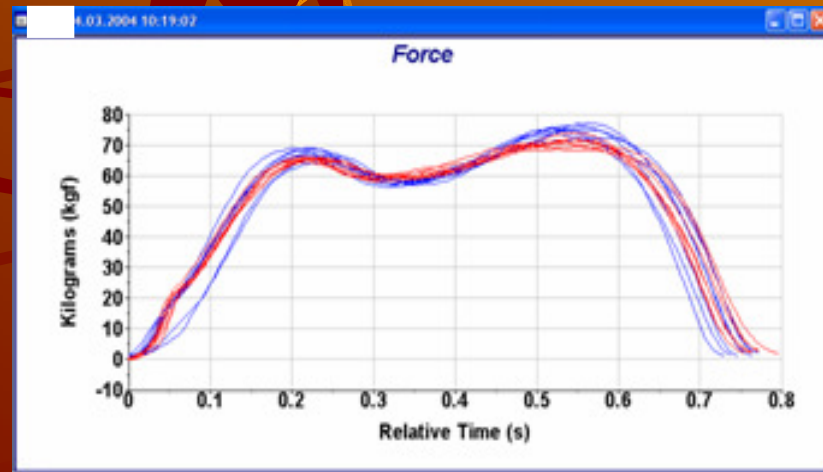
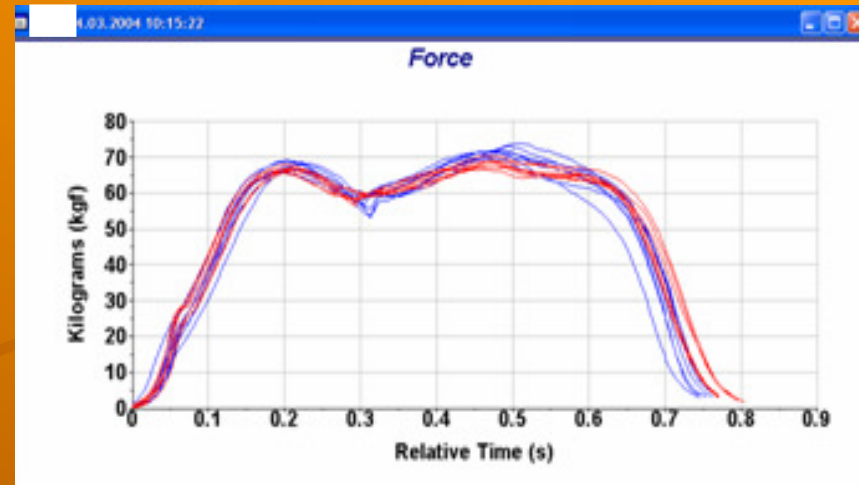
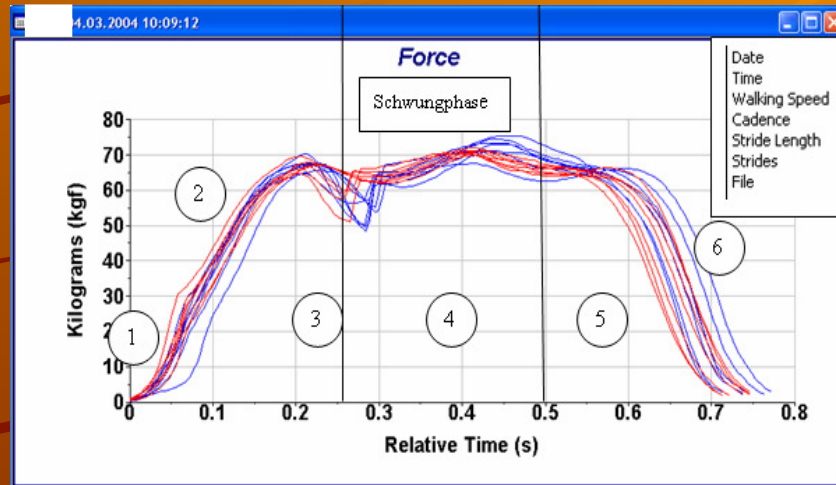
Zu harter Aufprall führte zu ISG Blockierung rechts.
Dass wiederum zu Muskulere Dysbalance und zu Zerrungen ?

Diskushernie L5 / S1



4 Tage später

Tractus Iliotibialis Syndrom



Schlussfolgerung

✦ Das Laufband mit integrierten Messplatten eignet sich hervorragend für

- Diagnostik
- Dokumentation des Befundes
- Verlaufbeobachtung
- Kontrolle der Ergebnisse
- Nachkontrolle und
- Qualitätssicherung in Physiotherapie und Sportmedizin



Danke!