



Karen Ellegaard  
Parker Institute/Ultrasound Unit  
Frederiksberg Hospital

1990: Fysioterapeut Kbh.

1990-01: Bispebjerg Hospital, Privat klinik, børnefys,  
ergonomiunvisning

2001-03: Østerbroundersøgelsen

2003-04: SDU

## 2004- Parker Instituttet

2006: Master i fysioterapi (Stockholm)

2009: Ph.d.-grad

2014: Head of US unit



# Application

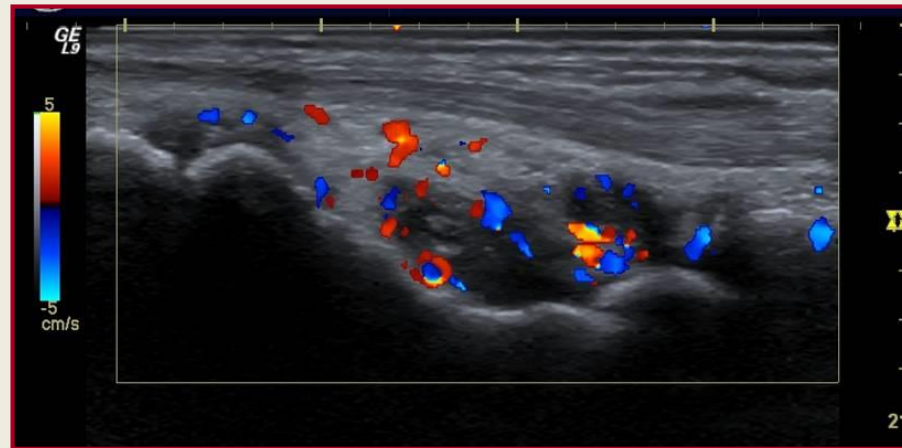
Dynamic real-time imaging technique

Confirm or change diagnose

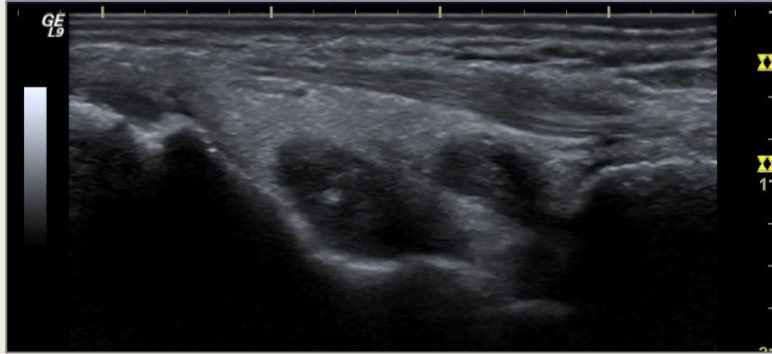
Guideline for therapy/intervention

# ***Accuracy of ultrasound Doppler measurements in assessment of disease activity in patients with rheumatoid arthritis***

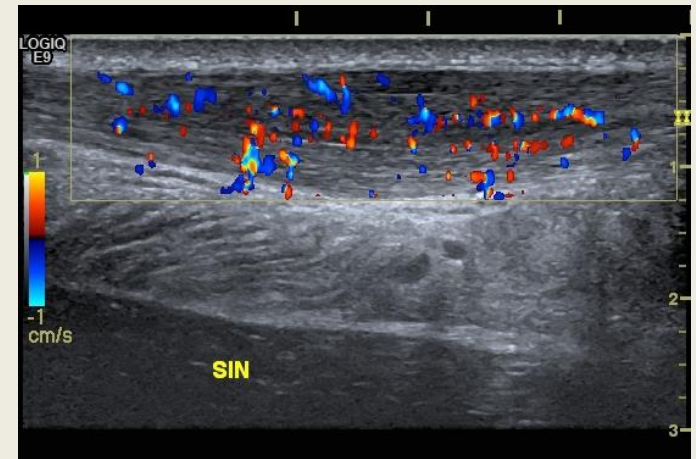
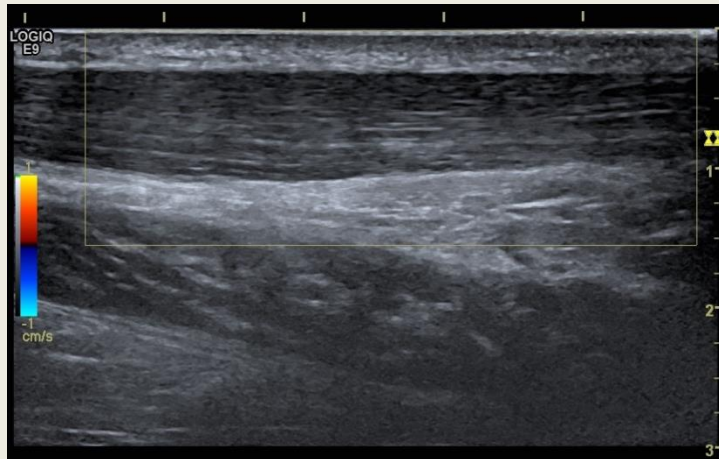
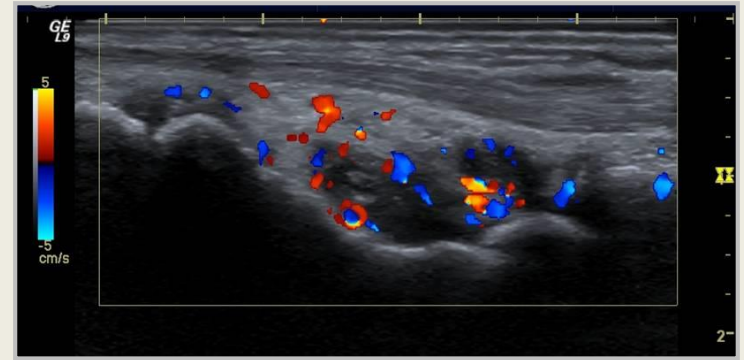
PhD defence by Karen Ellegaard  
October 2009



# Grey-scale

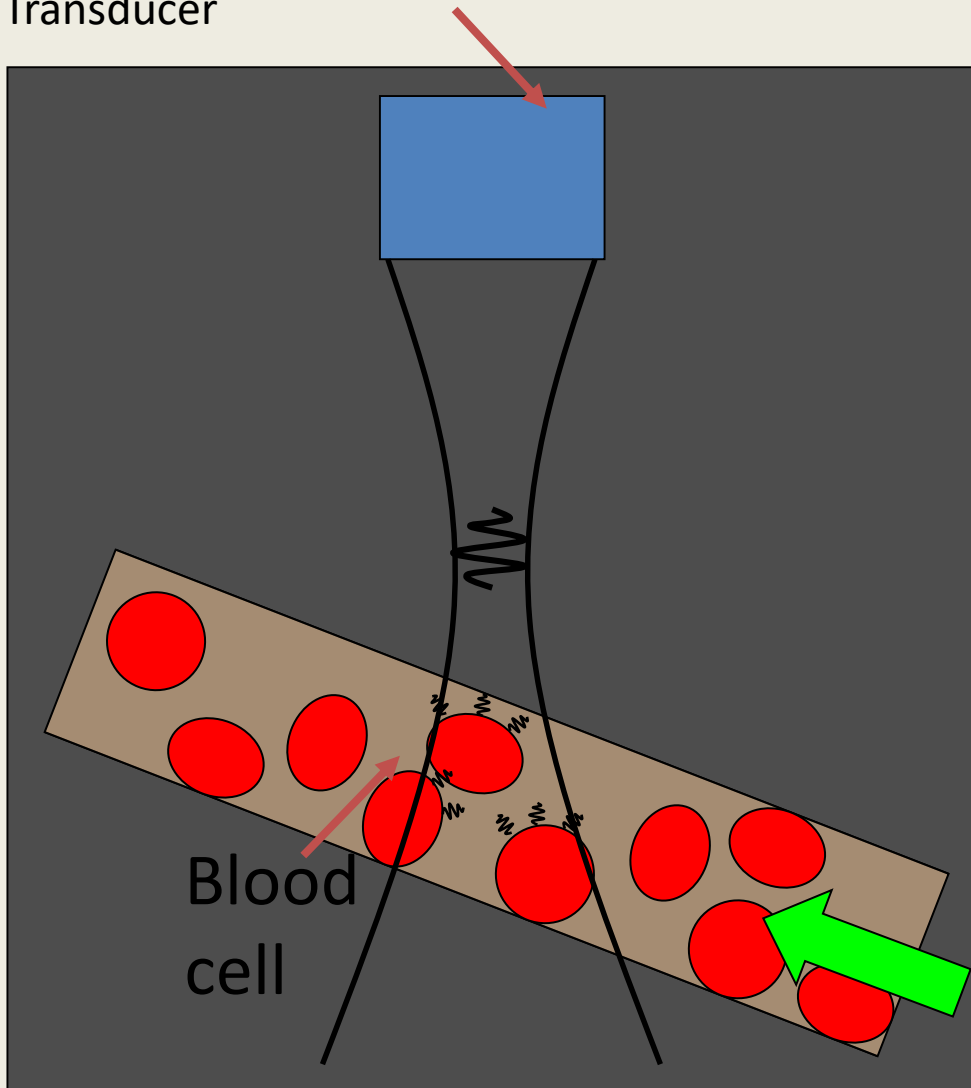


# Doppler



# Doppler

Transducer

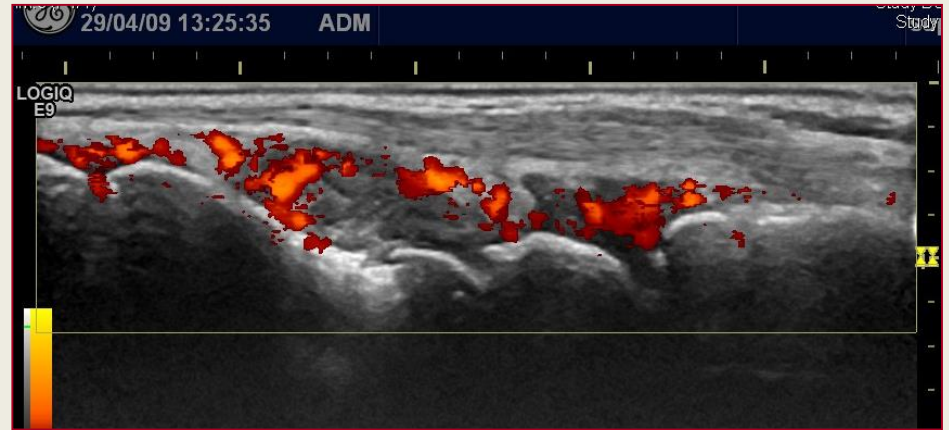


A moving reflector/emitter causes change in frequency

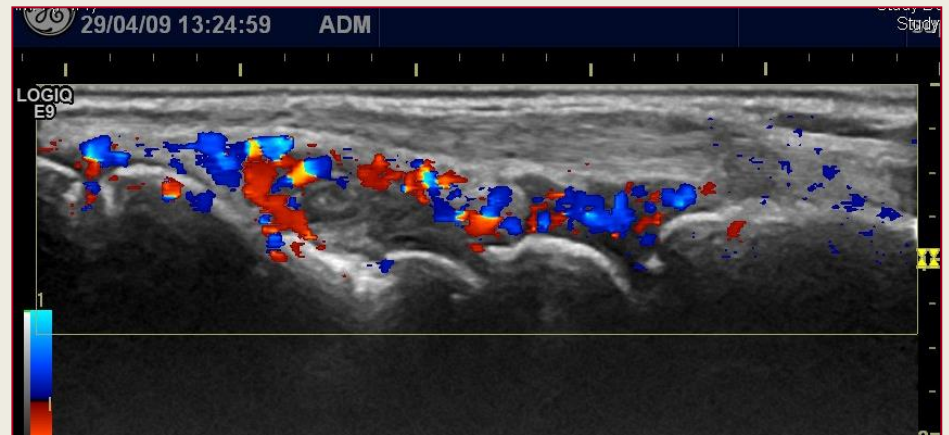
$$f_D = f_t - f_r$$

# Doppler type

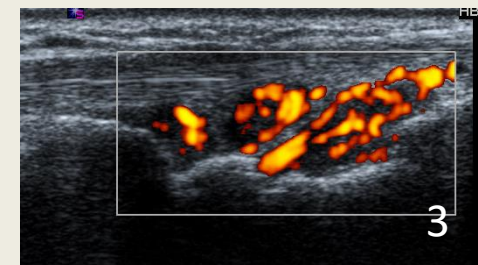
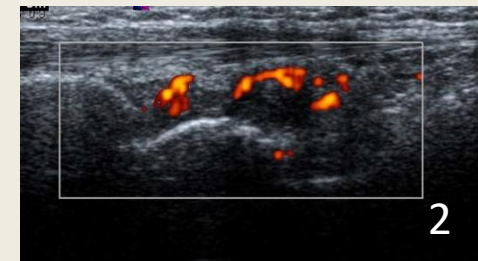
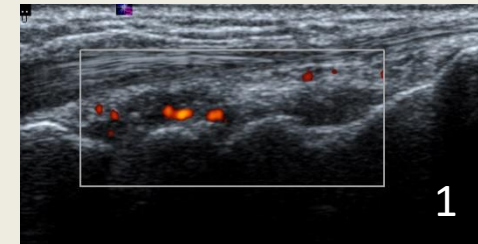
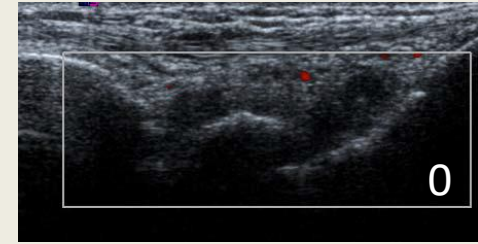
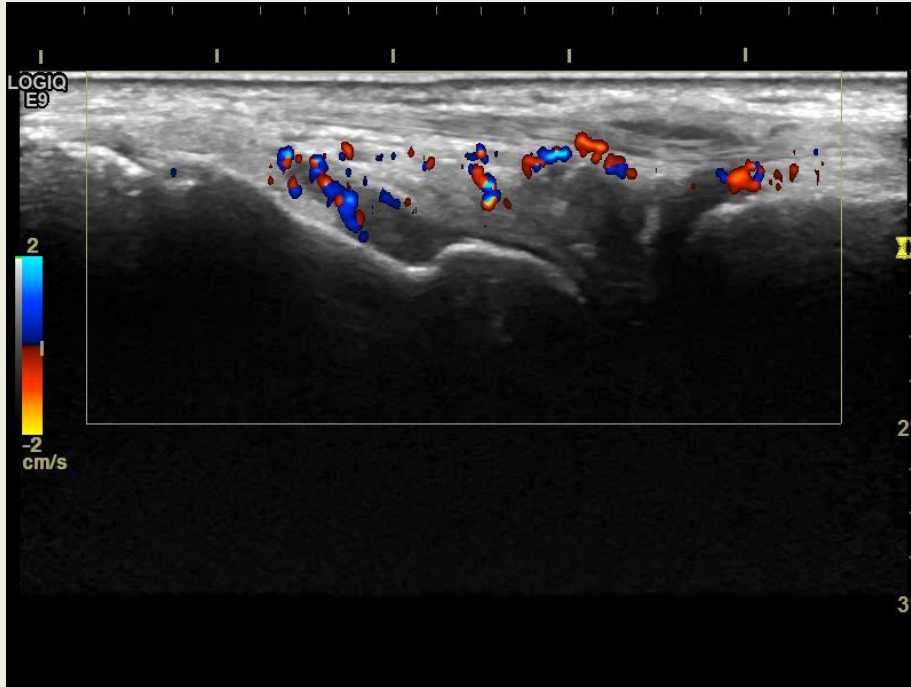
Power Doppler:  
(energy)



Colour Doppler:  
(velocity, direction)



# Scoring/evaluation



Hammer et al. Ultrasonography scoring reference atlas ver. 1.0



# Reliability

Original Article

393

## Quantification of Colour Doppler Activity in the Wrist in Patients with Rheumatoid Arthritis – the Reliability of Different Methods for Image Selection and Evaluation

Quantifizierung der Farbdoppler-Aktivität im Handgelenk bei Patienten mit rheumatoider Arthritis – Zuverlässigkeit verschiedener Methoden für Bildauswahl und Auswertung

**Authors**

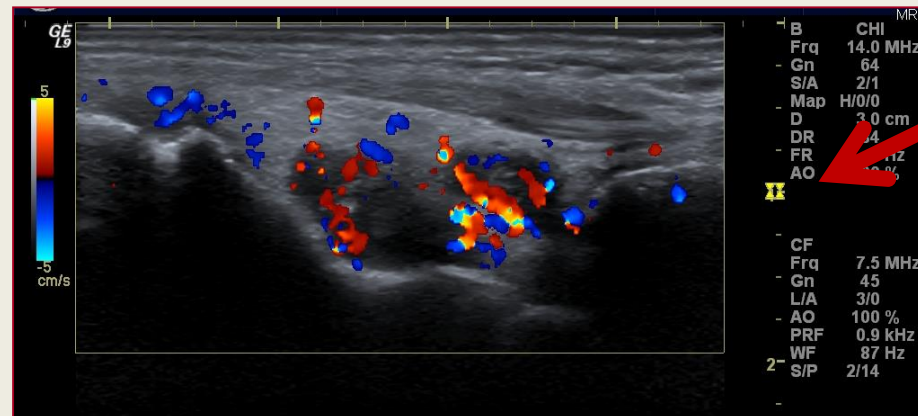
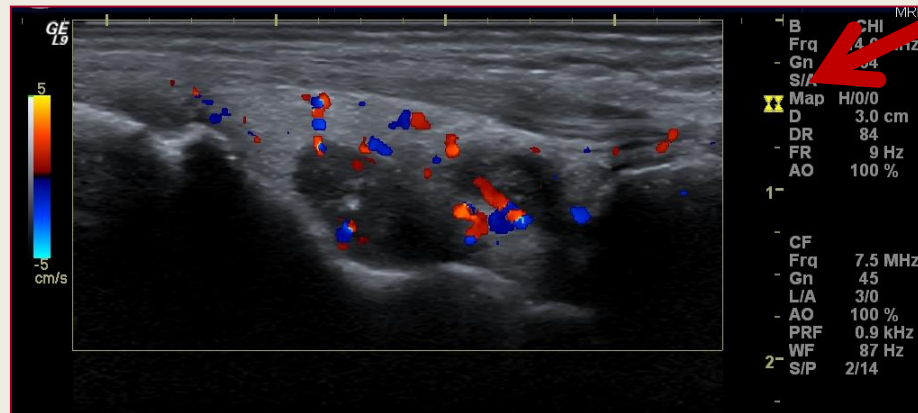
K. Ellegaard, S. Torp-Pedersen, H. Lund, M. Henriksen, L. Terslev, P. S. Jensen, B. Danneskiold-Samsøe, H. Bliddal

**Affiliation**

The Parker Institute, Frederiksberg Hospital

**Standardization and fixed pre-set (machine setting)!!!!!!**

# Fixed pre-set



# External factors

Rheumatology 2009; 1 of 4

doi:10.1093/rheumatology/kep294

## Concise Report

### **Influence of recent exercise and skin temperature on ultrasound Doppler measurements in patients with rheumatoid arthritis—an intervention study**

**Karen Ellegaard<sup>1</sup>, Søren Torp-Pedersen<sup>1</sup>, Marius Henriksen<sup>1</sup>, Hans Lund<sup>2</sup>, Bente Danneskiold-Samsøe<sup>1,3</sup> and Henning Bliddal<sup>1,3</sup>**

# Science in US

Investigation of reliability and validity of US

Modest intra and inter-observer reliability and validity

Response to therapy/treatment (prognostic validity);  
modest sensitivity. Most pronounced and rapid for Doppler.

# Why??

Dynamic real-time examination

Training mandatory

Standardization of examination and evaluation

Machine and pre-set important

# Science in US

[Power and color Doppler ultrasound settings for inflammatory flow: impact on scoring of disease activity in patients with rheumatoid arthritis.](#)

Torp-Pedersen S, Christensen R, Szkudlarek M, **Ellegaard K**, D'Agostino MA, Iagnocco A, Naredo E, Balint P, Wakefield RJ, Torp-Pedersen A, Terslev L.

Arthritis Rheumatol. 2015 Feb;67(2):386-95. doi: 10.1002/art.38940

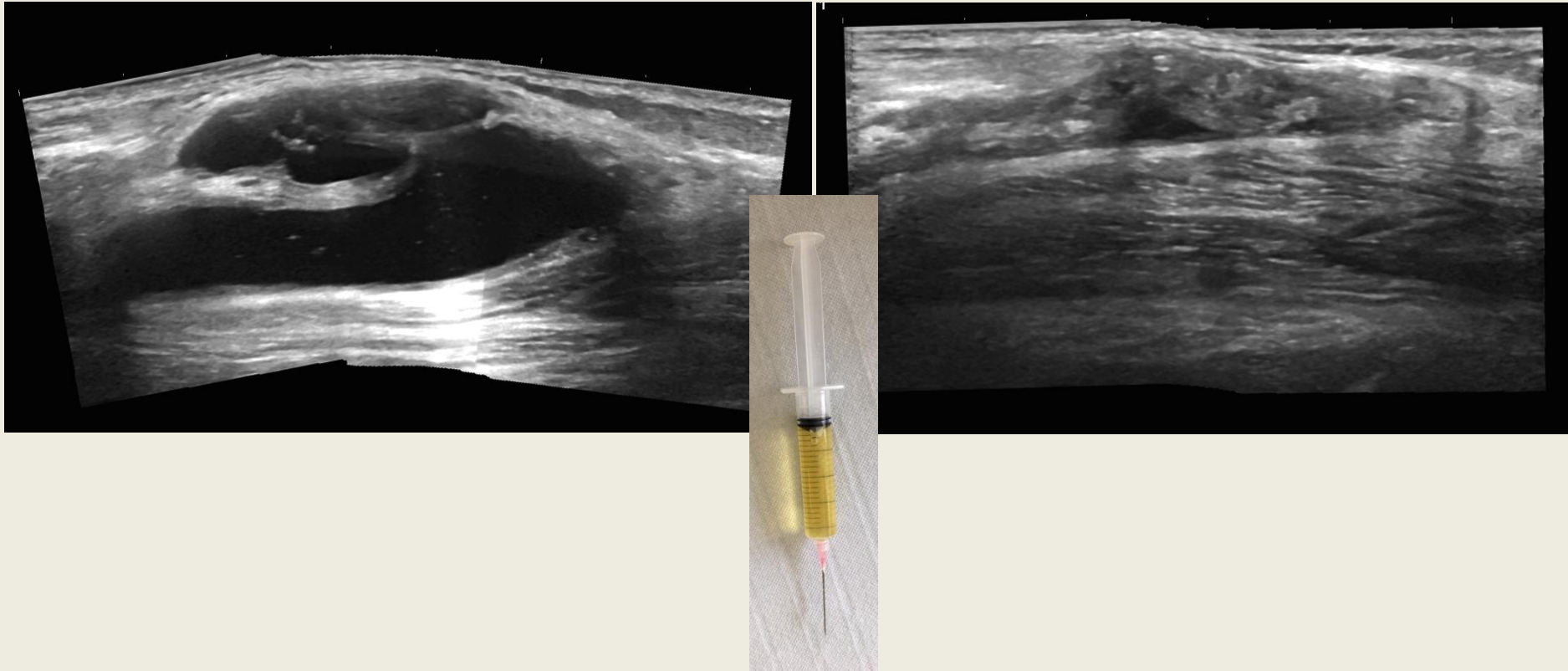


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# After PhD

½ patient US examination ½ US resource

From RA to OA and other peripheral joint diseases



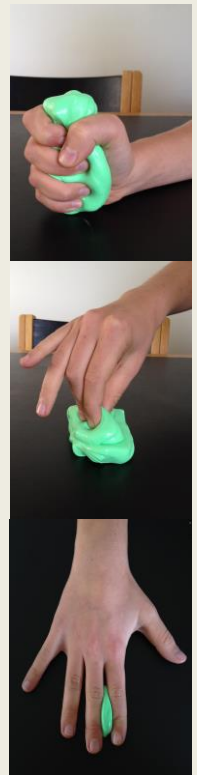
# Handexercise in RA

Rheumatol Int (2013) 33:65–70  
DOI 10.1007/s00296-011-2314-z

ORIGINAL ARTICLE

## The effect of isometric exercise of the hand on the synovial blood flow in patients with rheumatoid arthritis measured by color Doppler ultrasound

Karen Ellegaard · Søren Torp-Pedersen · Hans Lund ·  
Kirsten Pedersen · Marius Henriksen ·  
Bente Danneskiold-Samsøe · Henning Bliddal



Assessment of local disease activity after an intensive hand exercise program in patients with rheumatoid arthritis measured by ultrasound imaging: a randomized controlled trial

C. Bartholdy, M Henriksen, E E Wæhrens, K Ellegaard



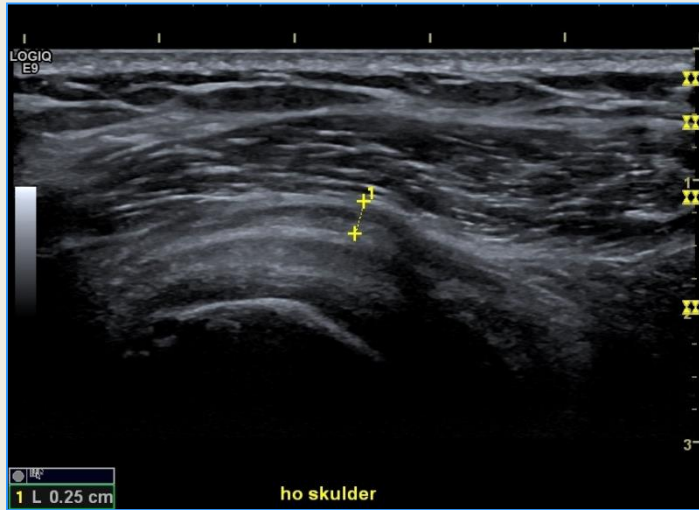
# Shoulder exercise

Intervention:

50 steroid & exercise painful shoulder

Control:

50 steroid & exercise non-painful shoulder



US:

Ensure homogeneous group

Correct placement of injection



# Shoulder exercise

Ellegaard *et al. Arthritis Research & Therapy* (2016) 18:129  
DOI 10.1186/s13075-016-1002-5

Arthritis Research & Therapy

RESEARCH ARTICLE

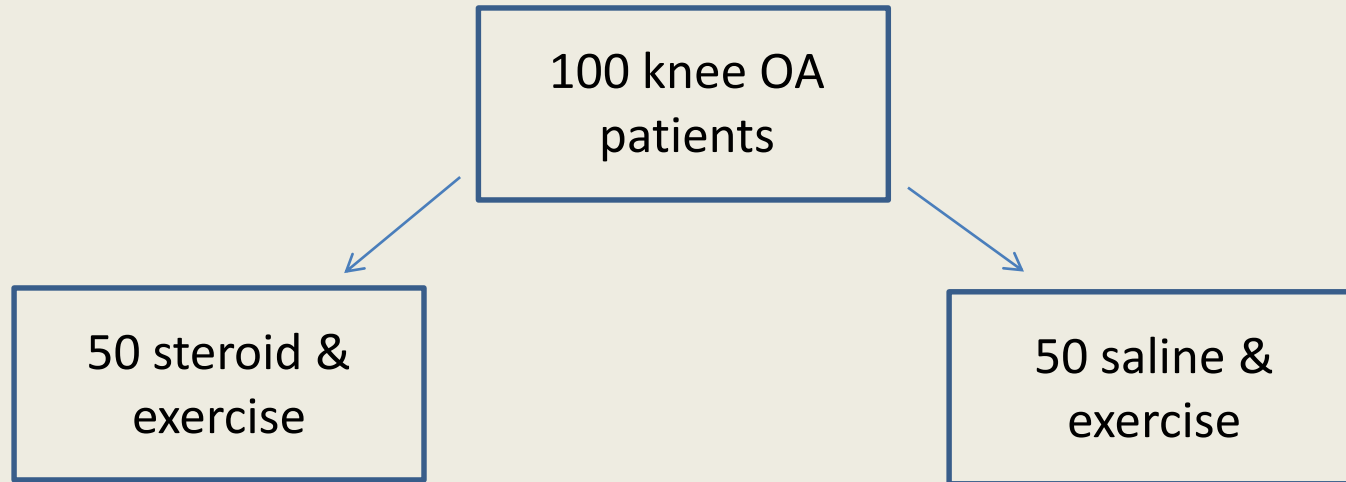
Open Access



## Exercise therapy after ultrasound-guided corticosteroid injections in patients with subacromial pain syndrome: a randomized controlled trial

Karen Ellegaard<sup>1\*</sup>, Robin Christensen<sup>1</sup>, Sara Rosager<sup>1</sup>, Cecilie Bartholdy<sup>1</sup>, Søren Torp-Pedersen<sup>1,5</sup>, Thomas Bandholm<sup>2,3,4</sup>, Bente Danneskiold-Samsøe<sup>1,6</sup>, Henning Bliddal<sup>1,6</sup> and Marius Henriksen<sup>1,7</sup>

# Knee Exercise



[Evaluation of the benefit of corticosteroid injection before exercise therapy in patients with osteoarthritis of the knee: a randomized clinical trial.](#)

Henriksen M, Christensen R, Klokke L, Bartholdy C, Bandak E, **Ellegaard K**, Boesen MP, Riis RG, Bartels EM, Bliddal H.

JAMA Intern Med. 2015 Jun;175(6):923-30. doi: 10.1001/jamainternmed.2015.0461

# Knee Exercise

## Osteoarthritis and Cartilage

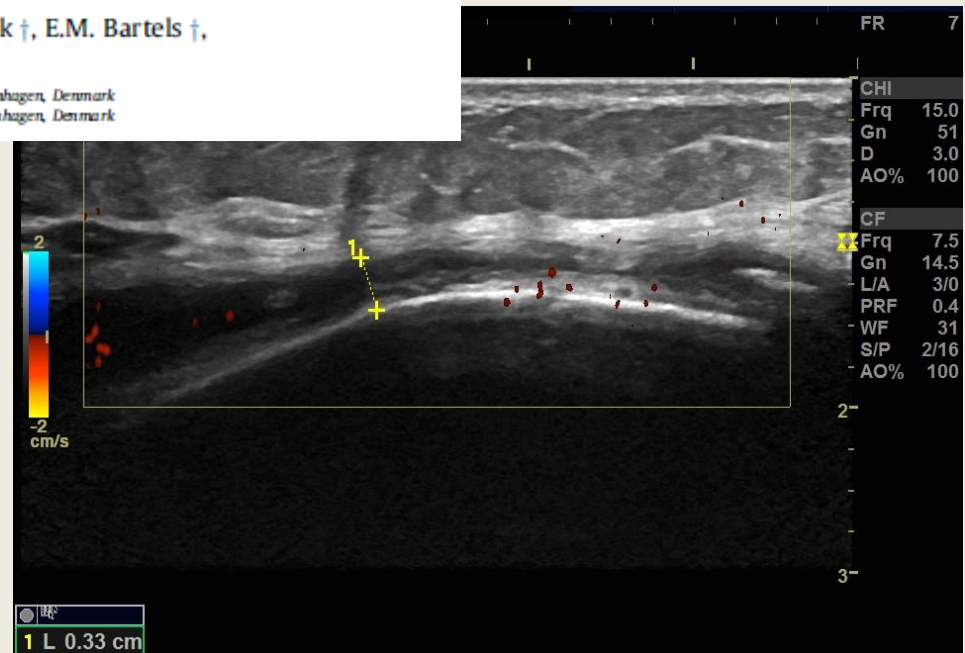


Changes in ultrasound assessed markers of inflammation following intra-articular steroid injection combined with exercise in knee osteoarthritis: exploratory outcome from a randomized trial



C. Henricsdotter †, K. Ellegaard †, L. Klokke †, C. Bartholdy †, E. Bandak †, E.M. Bartels †, H. Bliddal †, M. Henriksen ††\*

† The Parker Institute, Department of Rheumatology, Copenhagen University Hospital, Bispebjerg & Frederiksberg, Copenhagen, Denmark  
†† Department of Physical and Occupational Therapy, Copenhagen University Hospital, Bispebjerg & Frederiksberg, Copenhagen, Denmark



# Final remarks

Very useful together with to clinical examination

Very pedagogical tool

Be aware of:

Machine and pre-set

Difference between examiner



Development of new features

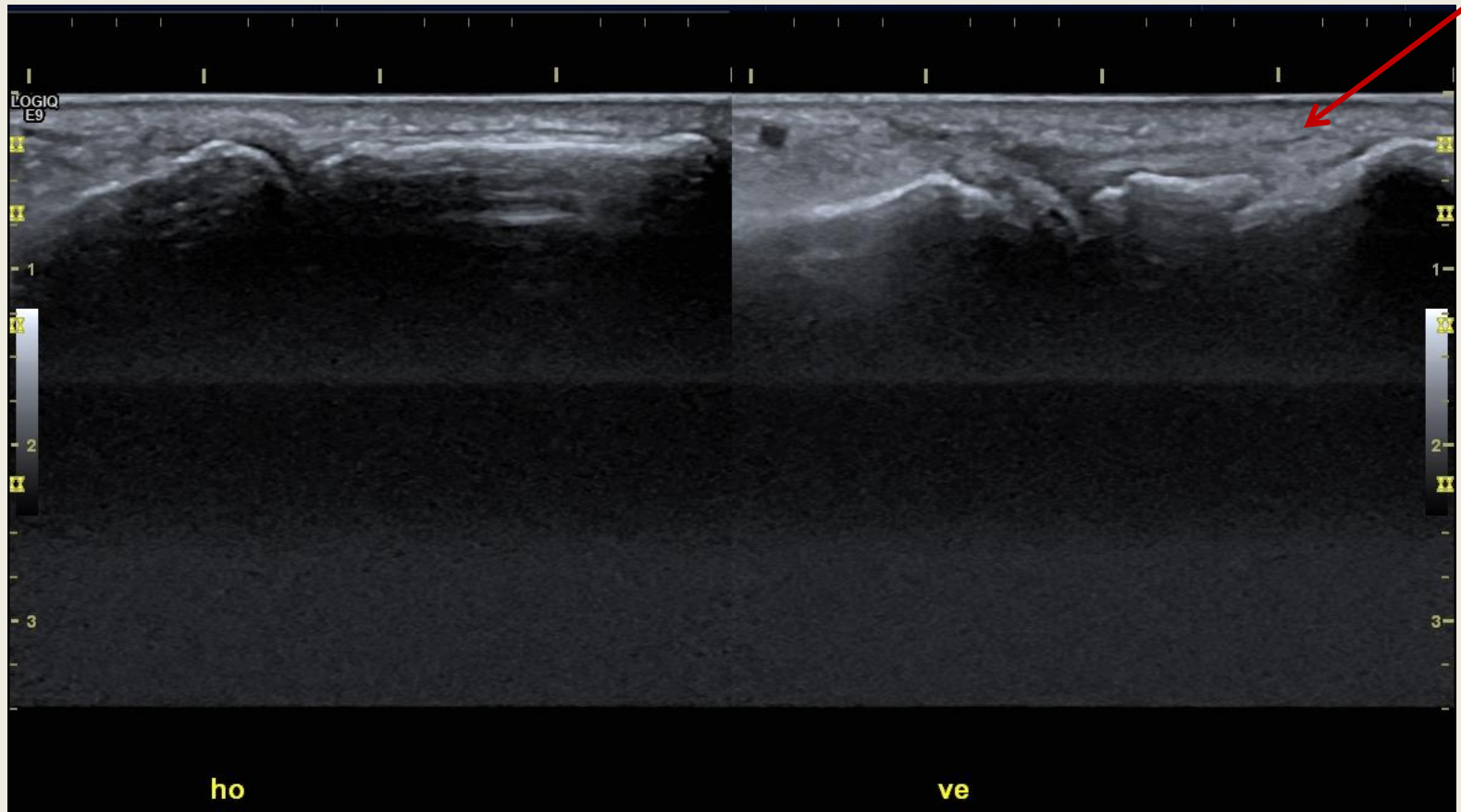
Do not "over interpret"

Strictly standardized examination and  
evaluation procedure

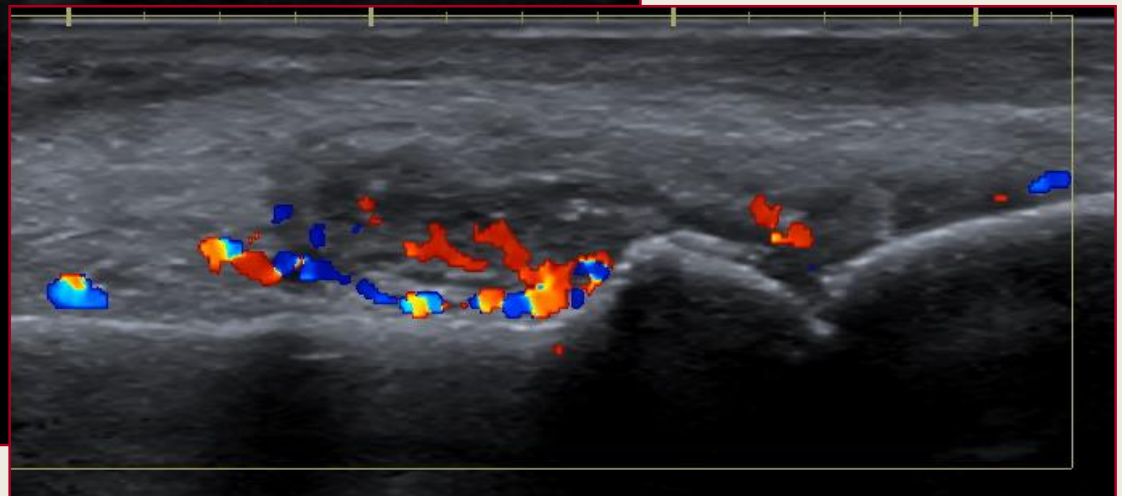
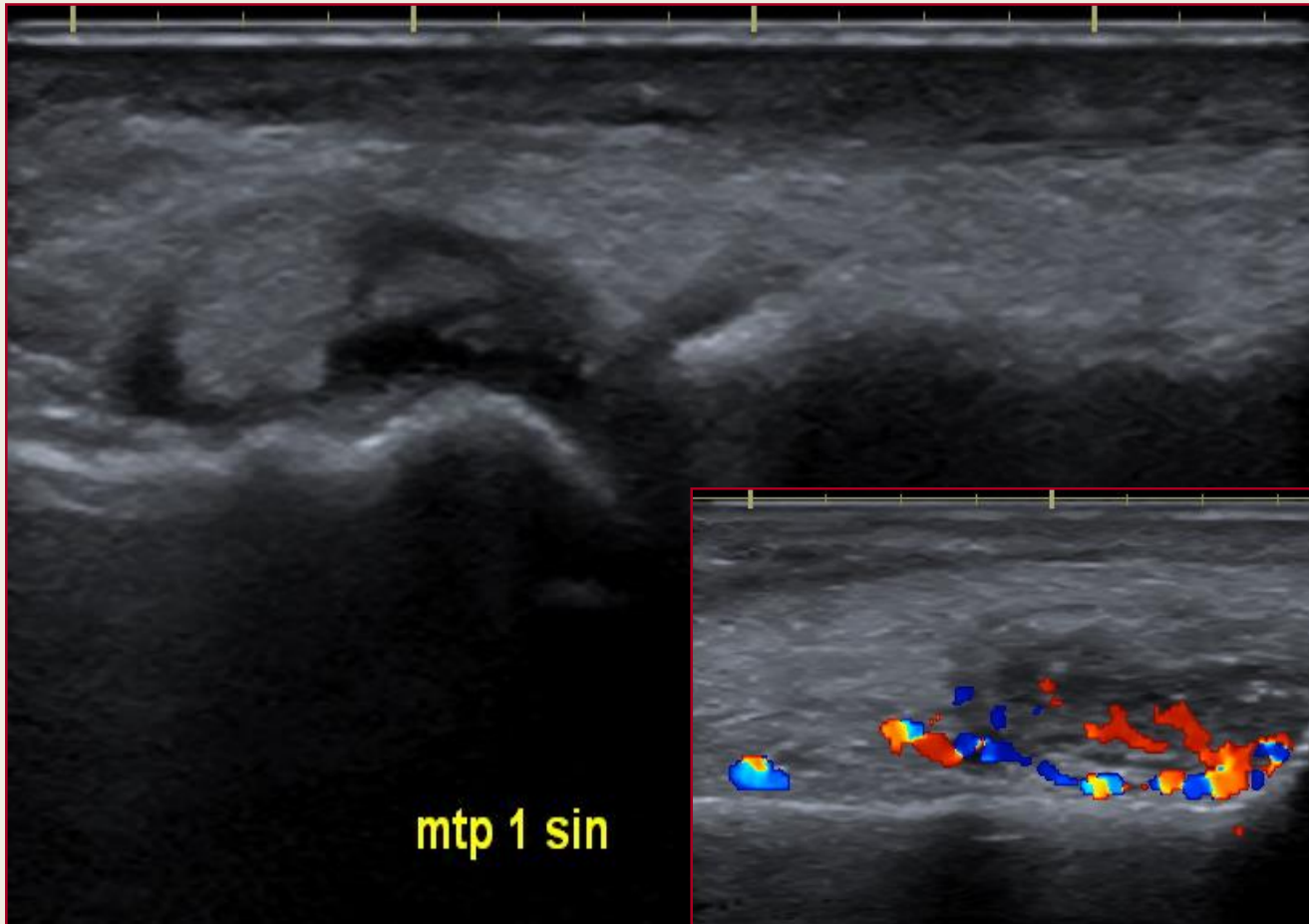


K.Ellegaard  
The Parker Institute

# 5 tå fraktur



# MTP hypertrofi





# Achillesene; bursa (long.)

