

ULTRALYD I ALMEN PRAKSIS

Store Praksisdag
Region Sjælland d.4.9.21



- Thomas Løkkegaard
 - Praktiserende læge, Lægerne Lyngby Hovedgade
 - Forskningsenheden for Almen Praksis, Aalborg
 - Næst-formand, Dansk Almenmedicinsk Ultralydsselskab



Ultralydsgruppen på CAM-AAU



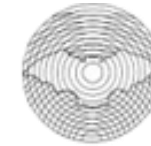
I samarbejde med...



CAMES Copenhagen Academy for Medical Education and Simulation



Center of Clinical Ultrasound - CECLUS



DANSK ULTRALYDDIAGNOSTISK SELSKAB - DUDS
DANISH SOCIETY OF DIAGNOSTIC ULTRASOUND - DSDU

The Örenäs Research Group

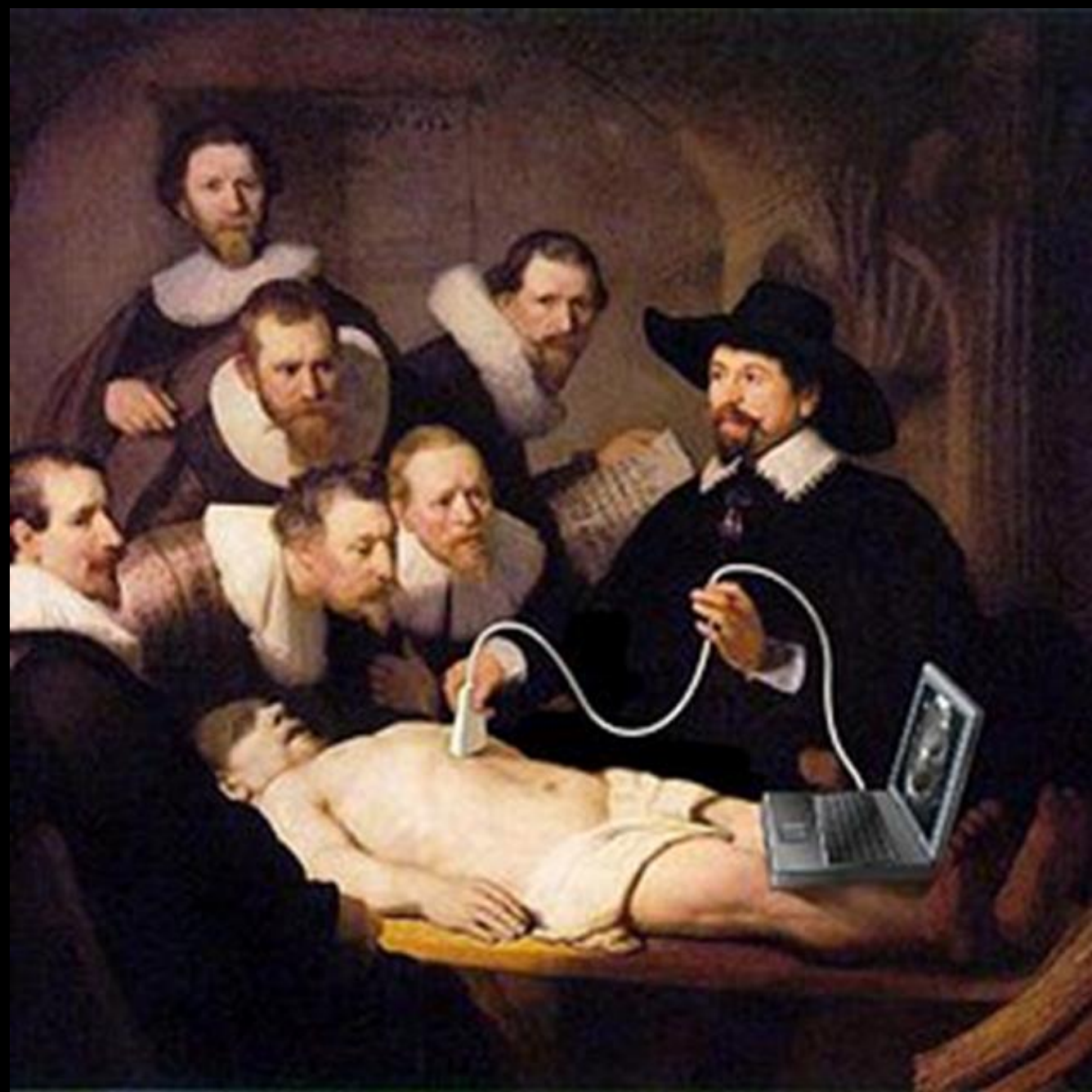


UiO: Avdeling for allmenmedisin



CONFLICTS OF INTEREST: INGEN





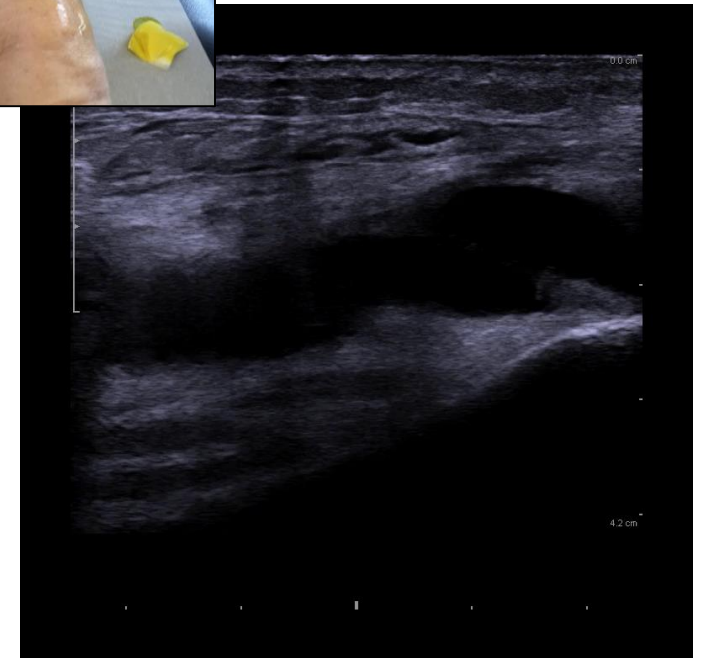
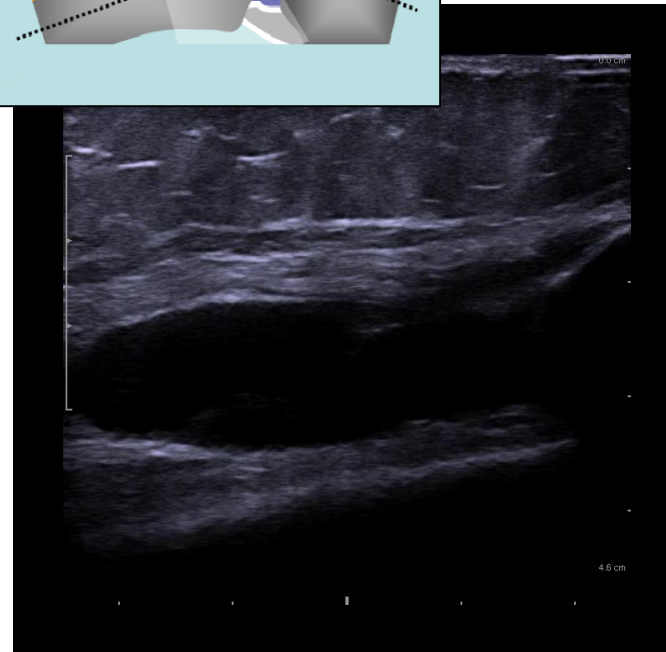
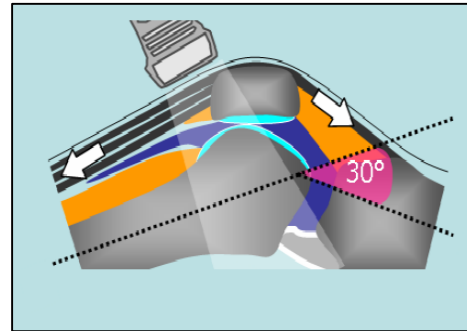
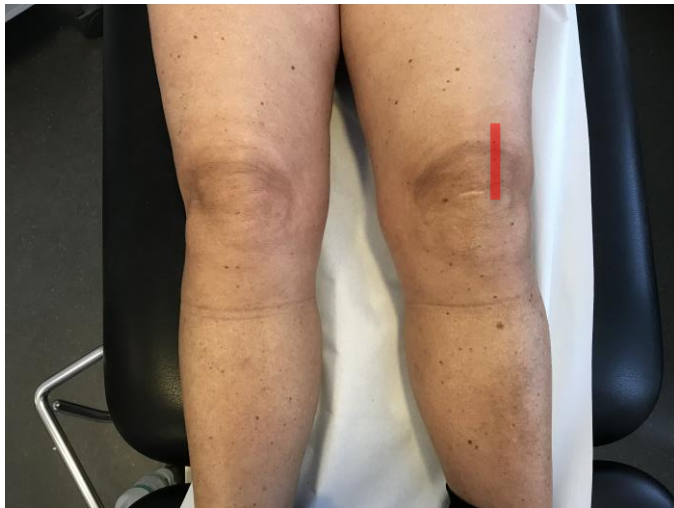
Jeg har skrevet en henvisning til en bedemand ...
Held og lykke med det hele!



Efter 35 år som praktiserende læge
havde dr. Hansen mistet gnisten

Patient case

75-årig kvinde med smerter i venstre knæ.




Program

- Point-of-care ultralyd – hvad er det?
- Brugen af point-of care ultralyd i almen praksis i Danmark
 - Hvor mange bruger det?
 - Hvordan bruger de det?
 - Kan de det?
 - Gør det nogen forskel?
 - Hvad siger patienterne?
 - Uddannelse
- Hvordan kommer jeg i gang?
- Patient cases
- Demonstration
- Diskussion

Hvad er fordele og ulemper ved at bruge ultralyd i almen praksis?



A close-up photograph of two hands shaking, symbolizing agreement or partnership. The hands are positioned in the center of the frame, with fingers interlaced. The background is a plain, light color.

OK-22

FORSØGSORDNING OM KLINISK ULTRALYD

- 3-årig
- Landsdækkende
- Projekt knyttet til forskningsenhederne
- 250 læger
- 150 ydelser/år
- Tillægssydelse: 262,37 kroner

A large rectangular concrete foundation formwork structure is shown under construction on a dirt site. The structure is built from multiple layers of light-colored wooden planks, forming a deep, rectangular pit. The interior of the pit is filled with dark brown soil. The surrounding ground is uneven and appears to be a construction site. In the background, there are more dirt mounds and some greenery. The text "Et fundament af viden" is overlaid in white on the left side of the image.

Et fundament af viden

Et bredt forskningsfundament

- Systematisk gennemgang af litteraturen
 - Praktiserende lægers brug af ultralyd
 - Træning af praktiserende læger i brug af ultralyd
- Interviews med praktiserende læger
 - Integration af ultralyd i konsultationen
 - Lærings strategier
 - Implementerings aspekter
- Kohorte studier i almen praksis
 - Ultralyds indflydelse på diagnostik og behandling i almen praksis
 - Evaluering af patientforløb med ultralyd
- Studier mhp curriculum
 - Delphi studie
- Spørgeskemaundersøgelser
 - Udbredelsen af ultralyd i Danmark
 - Patient oplevelsen

The concept of PoC-US

- Ultrasound performed at the bedside and interpreted directly by the treating clinician.
- PoC-US examinations are focused studies used to achieve specific procedural aims (*e.g.*, direct the needle to the correct location) or answer focused questions (*e.g.*, Does my patient have ascites?).
- PoC-US is not a replacement for a traditional comprehensive ultrasound exams

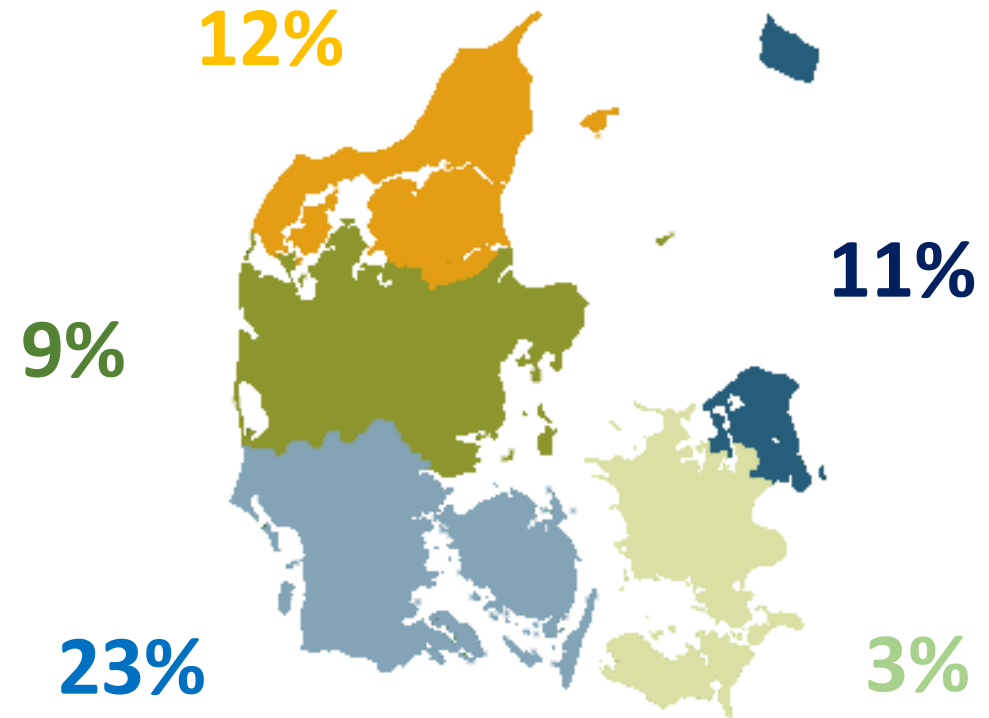
Hvor mange AP læger bruger UL i Danmark?

PLO spørgeskema (2019)

11% bruger ultralyd (54% dagligt)

14% adgang til en ultralydsskanner

72% har modtaget undervisning/oplæring i brug af ultralyd



Potential udbredelse af ultralyd

- 31% af ikke-brugere tror de vil bruge ultralyd i fremtiden
- 29% ved ikke
- 39% tror ikke de kommer til at bruge UL
 - 14% Mener ikke ultralyd hører hjemme i almen praksis
 - 4% Har ikke interesse for ultralyd



Fordele ved brug af ultralyd i AP

- Kvalificere diagnosen
- Kvalificere henvisninger
- Hurtigere diagnostik
- Afslutning af flere patienter i almen praksis
- Patient tilfredshed
- Arbejdsglæde - rekruttering

Barrierer for brug af ultralyd i dansk almen praksis?

- Manglende honorering
- Pris på ultralydsudstyr
- Arbejdsbyrden
- Tidsforbrug
- Uddannelse
- Manglende guidelines
- Adgang til undersøgelsen i sekundærsektoren





Hvilke skanninger udføres i
almen praksis?



Scandinavian Journal of Primary Health Care



ISSN: 0281-3432 (Print) 1502-7724 (Online) Journal homepage: <https://www.tandfonline.com/loi/ipri20>

Point-of-care ultrasound for general practitioners: a systematic needs assessment

Thomas Løkkegaard, Tobias Todsen, Leizl Joy Nayahangan, Camilla Aakjaer
Andersen, Martin Bach Jensen & Lars Konge

Hvilke skanningstyper og ultralyds-vejledte procedurer er vigtigst for praktiserende læger i deres daglige arbejde?

Delphi panelet

- ultralydskyndige læger

- Inklusion kriterier:
 - Praktiserende læge
 - > 2 års ultralydserfaring
 - Basis kursus
 - Anvende POCUS dagligt
 - Arbejde i Skandinavien
- Eksklusions kriterier:
 - Finansielle interesser
 - Må ikke arbejde i samme praksis





Achilles tendinitis and rupture
Knee joint effusion
Shoulder:

- Subacromial/subdeltoid bursitis
- Biceps tendinitis, tenosynovitis, tendon rupture
- Rotator cuff tendinitis and/or ruptures

Elbow joint effusion
Trochanter bursitis
Bakers cyst



Subcutaneous abscesses
Subcutaneous tumors
Localization of foreign body



Living intrauterine pregnancy
Fetal position
Gestational age (CRL)
First trimester bleeding



Pleural effusion



Gall stones
Free abdominal fluid
Cholecystitis



DVT



Hydrocele/varicocele



Pericardial effusion



Bladder volume
Hydronephrosis



Localization of IUD



Abdominal aortic aneurysm (AAA)



Injection shoulder

Injection/aspiration, Bakers cyst

US guided abscess drainage

Injection/aspiration knee joint

APO projekt Region Syddanmark

Family Practice, 2020, 1–8
doi:10.1093/fampra/cmaa080

Health Service Research

Introducing point-of-care ultrasound in Danish general practice—elucidating the use through a medical audit

Camilla Aakjær Andersen^{a,*}, Annika Kamp Frandsen^a,
Christian Valentiner-Branth^b, Jesper Lykkegaard^c, Thomas Løkkegaard^a,
Janus Laust Thomsen^a, Martin Bach Jensen^a and
Malene Plejdrup Hansen^{a,c}

Region Syddanmark

30 praktiserende læger

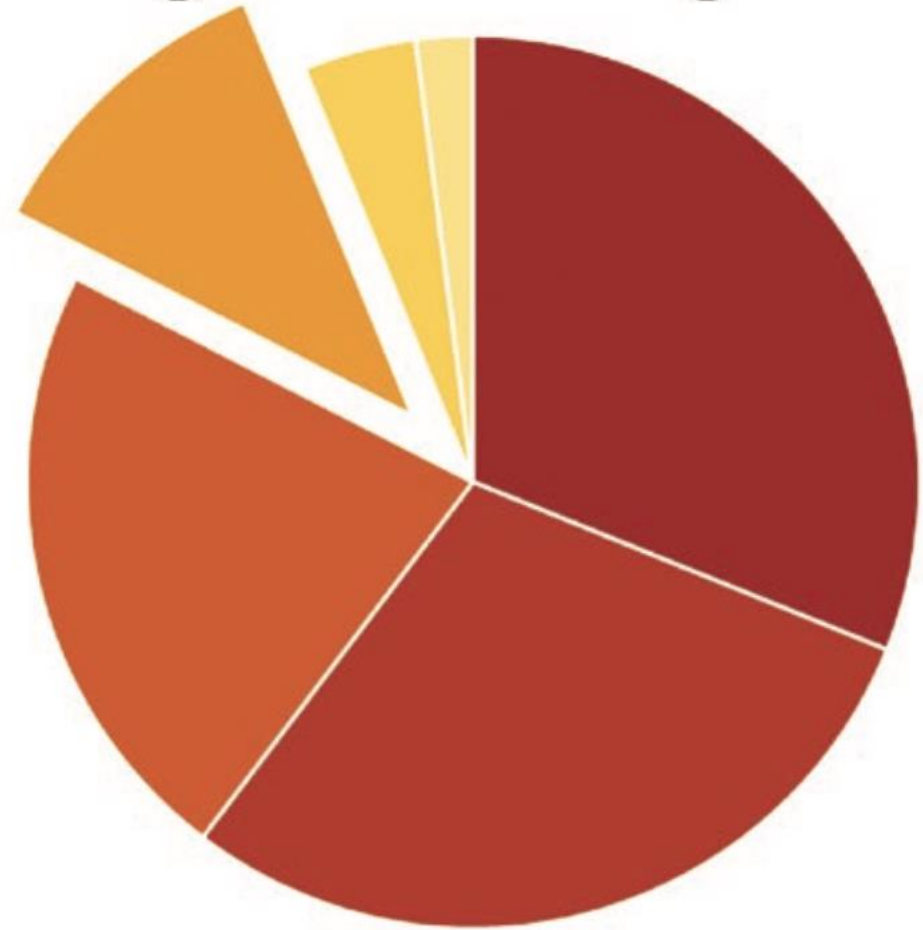
2 dages kursus

1598 pt. over 3 måneder

7-112 patienter pr. læge

Distribution of registered scanning modalities, n=1948

Missing data	13
Skin	40 (2)
Abscess	40
Lungs	80 (4)
Pleural effusion	56
Interstitial syndrome	24
Other	207 (11)
Gynecology and obstetrics	433 (22)
Intrauterine pregnancy with fetal heartbeat	174
Gestational age: Crown-rump length	80
Fetal presentation in third trimester	49
Location of intrauterine device	130



Musculoskeletal	606 (31)
Fluid around the biceps tendon	101
Subacromial bursitis	100
Pathology of the acromio-clavicular joint	78
Knee effusion	164
Baker's cyst	77
Achilles tendon tear	11
Achilles tendinopathy	42
Plantar fasciitis	33
Abdomen	569 (29)
Abdominal aortic aneurism	54
Cholelithiasis	119
Cholecystitis	49
Hydronephrosis	112
Post-void residual urine	172
FAST: Intrapertoneal fluid	47
FAST: Pericardial effusion	16

Brug af ultralyd



RESEARCH ARTICLE

Open Access

Danish general practitioners have found their own way of using point-of-care ultrasonography in primary care: a qualitative study



Camilla Aakjær Andersen^{1*}, Annette Sofie Davidsen², John Brodersen³, Ole Graumann⁴ and Martin Bach Jensen¹

Udvalgte fokuserede scanninger

- Hjælpemiddel til lægen
- Individuelt curriculum
- Comfort zone (sikkerhed)
- Integreret del af patientundersøgelsen
- Konsekvenser for diagnostik, visitation eller behandling

Udvidede eksplorerende scanninger

- Træning eller nysgerrighed
- Ikke en del af curriculum
- Udenfor comfort zone
- Noget ekstra i konsultationen
- Ingen konsekvens
- Tilfældige fund henvist til hurtig udredning

QUALITY



'Validation of ultrasound examinations performed by general practitioners'

Karsten Lindgaard and Lars Riisgaard

General Practice, Laegerne Baneplassen, Otterup, Denmark

ABSTRACT

Objective: The aim of this study was to evaluate the diagnostic agreement when a general practitioner and subsequently a specialist (radiologist/gynecologist) performed point-of-care ultrasound examinations for certain abdominal and gynecological conditions of low to moderate complexity.

Design: A prospective study of inter-rater reliability and agreement.

Setting: Patients were recruited and initially scanned in general practice. The validation examinations were conducted in a hospital setting.

Subjects: A convenient sample of 114 patients presenting with abdominal pain or discomfort, possible pregnancy or known risk factors toward abdominal aortic aneurism were included.

Main outcome measures: Inter-rater agreement (Kappa statistic and percentage agreement) between ultrasound examinations by general practitioner and specialist for the following conditions: gallstones, ascites, abdominal aorta >5 cm, intrauterine pregnancy and gestational age.

Results: An overall Kappa value of 0.93 (95% confidence interval (CI): 0.87–0.98) was obtained. Ascites, abdominal aortic diameter >5 cm, and intrauterine pregnancy showed Kappa values of 1.

Conclusion: Our study showed that general practitioners performing point-of-care ultrasound examinations with low-to-moderate complexity had a very high rate of inter-rater agreement compared with specialists.

ARTICLE HISTORY

Received 9 February 2017

Accepted 27 June 2017

KEYWORDS

General practitioners; family medicine; ultrasonography; inter-rater reliability; validation; education

- 5 praktiserende læger
- 188 UL scanninger
- UL af galdesten, ascites, aorta, intrauterin graviditet, gestationsalder
- Kontrol på radiologisk afd/ gynækolog
- Sensitivitet: 0,92-1,00
- Specificitet: 0,92-1,00



Konsekvenser af skanningen

Open access

Original research

BMJ Open Use and impact of point-of-care ultrasonography in general practice: a prospective observational study

Camilla Aakjær Andersen ¹, John Brodersen,^{2,3} Annette Sofie Davidsen,² Ole Graumann,⁴ Martin Bach B Jensen ¹

- UL ændrede diagnosen: 49,4%
- UL ændrede visitationen: 50,9%
- UL ændrede behandlingen: 26,5%
- UL medførte ændring hos: 71,2%
- UL øgede lægens sikkerhed: 89%

A photograph of a female doctor in a white lab coat and a male patient with glasses and a beard sitting at a desk in a clinic. They are both looking at a document held by the doctor. The background features medical posters on the wall, including one titled 'The Respiratory System' and another with anatomical diagrams. A computer monitor is visible on the left side of the frame. The text 'Hvad siger patienten?' is overlaid in white on the center of the image.

Hvad siger patienten?

RESEARCH

Open Access



Patients' experiences of the use of point-of-care ultrasound in general practice – a cross-sectional study

Camilla Aakjær Andersen^{1*}, John Brodersen^{2,3}, Torsten Rahbek Rudbæk⁴ and Martin Bach Jensen¹

- 99 % UL indgik naturligt i konsultationen
- 93 % Grundigere undersøgt
- 81 % Bedre forklaring på deres helbredsproblem
- 88% Mere trygge (12 % hverken eller)
- 95 % Bedre kvalitet i behandlingen
- 98 % Samlet positivoplevelse

UDDANNELSE

Family Practice, 2020, 1–11
doi:10.1093/fampra/cmaa140

Systematic Review

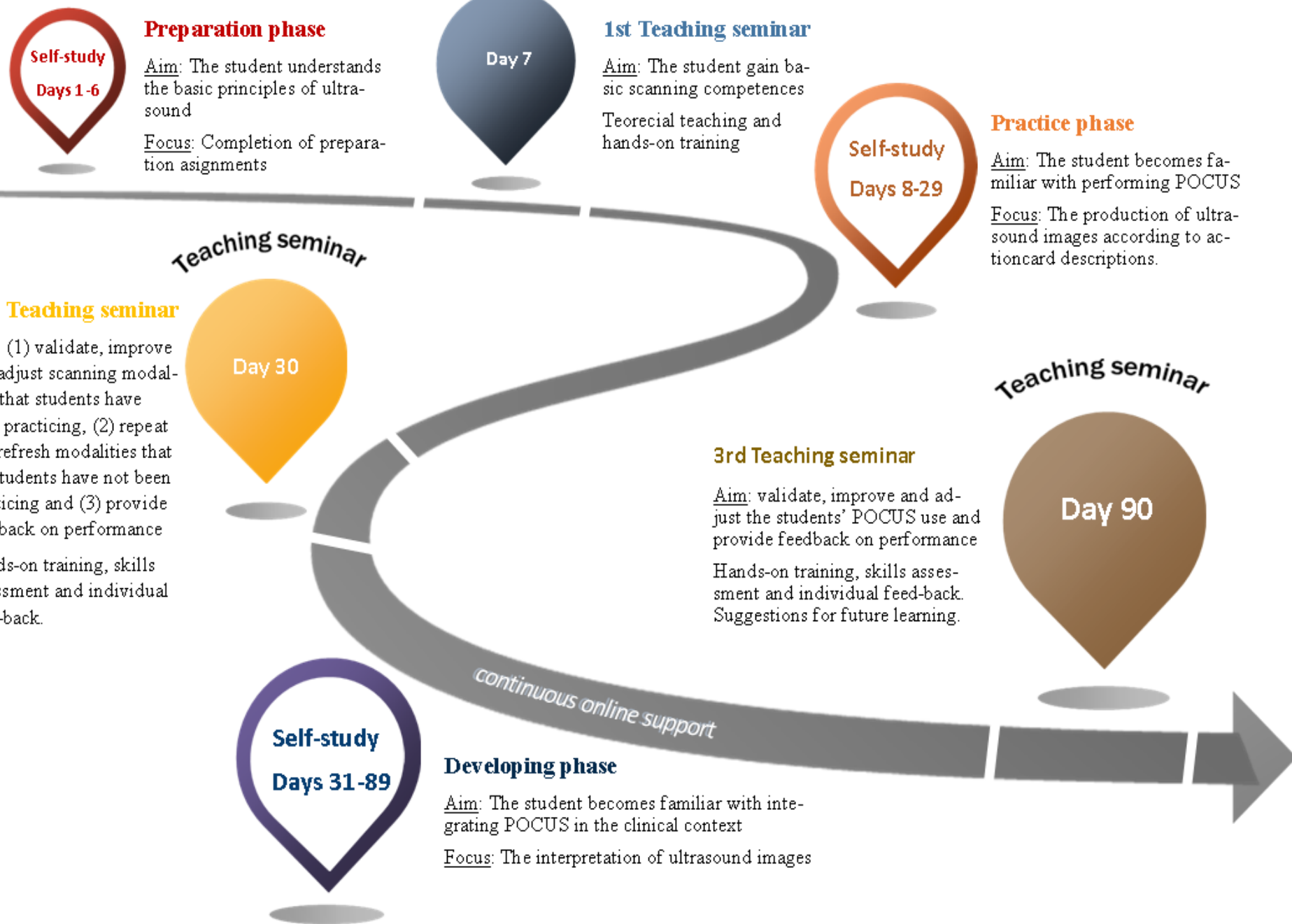
Education of general practitioners in the use of point-of-care ultrasonography: a systematic review

Camilla Aakjær Andersen^{a,*}, Henriette Sav Hedegård^a,
Thomas Løkkegaard^a, Joachim Frølund^b and Martin Bach Jensen^a

^aCenter for General Practice at Aalborg University, Aalborg, Denmark and ^bCenter for Health Sciences Education, Aarhus University, Aarhus, Denmark



“Higher diagnostic accuracy was found with longitudinal practical training”



Self-study
Days 1-6

Preparation phase

Aim: The student understands the basic principles of ultrasound

Focus: Completion of preparation assignments

Teaching seminar

Day 7

1st Teaching seminar

Aim: The student gain basic scanning competences

Teoretical teaching and hands-on training

Self-study
Days 8-29

Practice phase

Aim: The student becomes familiar with performing POCUS

Focus: The production of ultrasound images according to actioncard descriptions.

Teaching seminar

Day 30

2nd Teaching seminar

Aim: (1) validate, improve and adjust scanning modalities that students have been practicing, (2) repeat and refresh modalities that the students have not been practicing and (3) provide feedback on performance

Hands-on training, skills assessment and individual feed-back.

Teaching seminar

Day 90

3rd Teaching seminar

Aim: validate, improve and adjust the students' POCUS use and provide feedback on performance

Hands-on training, skills assessment and individual feed-back. Suggestions for future learning.

Self-study
Days 31-89

Developing phase

Aim: The student becomes familiar with integrating POCUS in the clinical context

Focus: The interpretation of ultrasound images

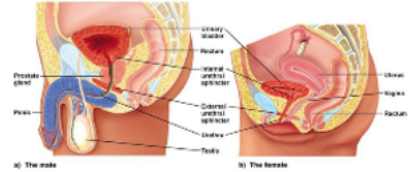
continuous online support

Actioncard: Rektum diameter

Spørgsmål som kan besvares ved point-of-care ultralyd i almen praksis:

Har barnet en øget rektum diameter som tegn på obstruktion?
 (Såvel ved færdning og morforening af (kronisk) obstruktion hos børn i alderen 4 til 11 år.)

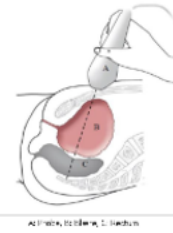
Oversigt anatomi:



Probe valg:

Konveks (abdominal probe) 5 til 7.5 MHz

Probens placering og udmåling:



Barnet skal ligge afslappet på ryggen med arme ned langs siden.

Proben placeres 2cm over symfyisen i en nedadrettet vinkel (10-15 grader) fra transversalplanet mod os coccygis.

Blæren bruges som akustisk vindue (Ideelt er blæren fyldt med min. 20% af forventet kapacitet for alderen: 30x [alder i år+1] ml)

Rektal diameter måles fra ydre til ydre væg



Mulige fejlkilder:

En tom blære = minus akustisk vindue
 Defækationstrang på scanningstidspunktet.

Patologi:

UL fund indgår i ROME IV kriterierne.

Kronisk forstoppelse = opfylder min 2 af ROME IV kriterierne
 (mindst 1 gang pr uge i min 4 uger for børn >4 år)
 •Færre end 3 afføringer pr uge
 •≥1 episode med fækal inkontinens pr uge
 •Retentiv adfærd / Overdreven tilbageholdelse af afføring
 •Smertefuld afføring
 •Stor fæces mængde i rektum (UL fund: Cut-off 3,0 cm for børn i alderen 4-13 år)
 •Periodevis kvittering af afføring med stor diameter afføring

Kilder:

Carex. Rektal diameter i rektum undersøgt ved ultralyd ved behandling af obstruktion og fækal inkontinens.
 NICE guidelines. Constipation in children and young people: diagnosis and management. Updated childhood constipation primary and secondary care. NICE guideline [CG99] Published 2016. May 2017.

Equipment needed

Possible pitfalls

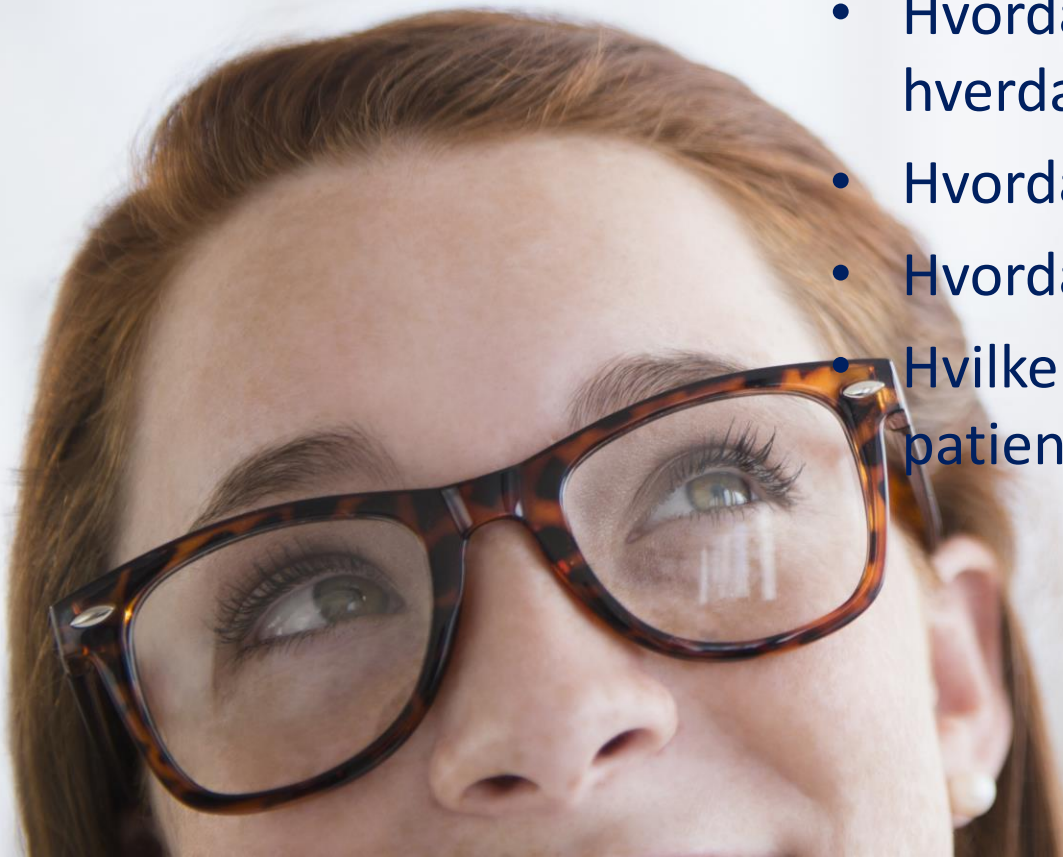
Indication for using POCUS

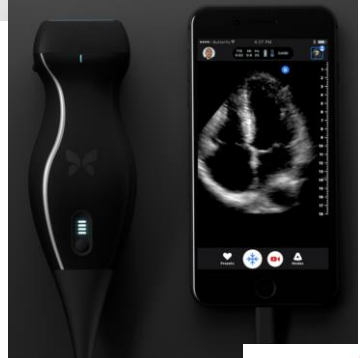
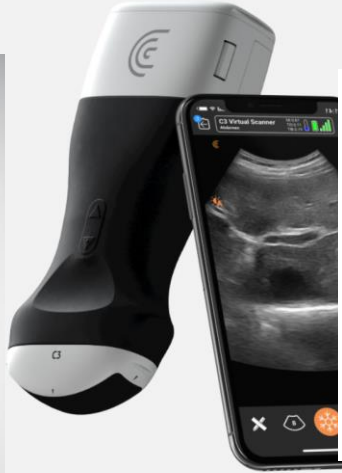
Procedure description and image illustration

Interpretation in a clinical context

Hvad skal jeg overveje?

- Hvad er mit budget?
- Hvilken type skanner vil jeg have?
- Ny, refurbished, brugt, demo?
- Hvad vil jeg skanne?
- Hvordan skal jeg få tid til at skanne i en travl hverdag?
- Hvordan lærer jeg at ultralydsskanne?
- Hvordan vedligeholder jeg mine kompetencer?
- Hvilken holdning har mine kolleger, personale og patienter til ultralydsskanning?





EFSUMB:

Three levels of mobile ultrasound*

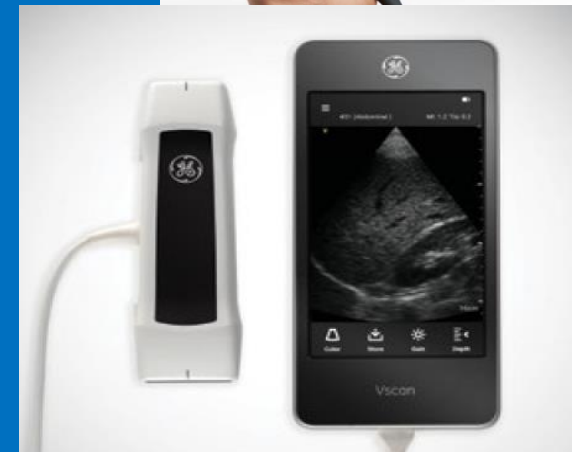


- Håndholdte skannere.
- Skannere til point-of-care ultralyd.
- Avancerede skannere med high-end udstyr til ultrasonografi eller ekkokardiografi.

* Ultraschall in der Medizin - European Journal of Ultrasound 2013;
34(01): 92 - 92

Håndholdte skannere

- Smartphone størrelse
- Lille skærm med begrænset opløsning
- Begrænsninger i transducervalg
- Nem at anvende "bedside" med henblik på at udvide den objektive undersøgelse eller til at afløse stetoskopet.
- Betjenes via app's som løbende opdateres med nye features
- Nem up-load til cloud
- Pris: 25-75.000 kroner



Mid-range

- Inkluderer ultralydsfeatures som på high-end skannere
- God billedkvalitet
- Stor skærm
- Bærbar og kan placeres på trolley med hjul
- Starter hurtigt op
- Pris: 100-250.000 kroner



High-end scanners

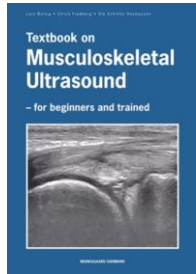
- Bedste kvalitet med alle features og høj skærmopløsning
- 3D/4D
- Stor, tung og svær at transportere rundt
- Bruges til ultrasonografi og ekkokardiografi
- Pris: >300.000 kroner



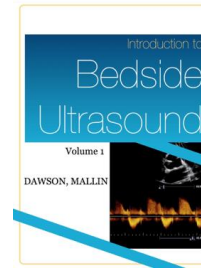
KURSER

- DAUS (Dansk Almenmedicinsk Ultralydsselskab)
 - PLO-e basiskursus CECLUS
 - PLO-e basiskursus CAMES
 - PLO-e basiskursus Odense
 - Lægedage
 - Årsmøde
 - Ad hoc kurser
- FUA (Forening for Ultralyd i Allmen Praksis, Norge)
 - Oppdals uke
- DUDS (Dansk Ultralyds-diagnostisk Selskab)
 - Ultralydskursus i Gynækologi og Obstetrik
 - DUDS Basiskursus x 2 årligt (Herlev hospital)
 - Kursus i Muskuloskeletal Ultralyd (Hvidovre hospital)
 - Kursus i Muskuloskeletal Ultralyd (Skejby)

BØGER



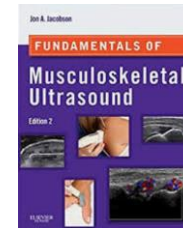
“Textbook on Musculoskeletal Ultrasound”. Munksgaard.
Kan bade købes som bog og e-bog på Munksgaards hjemmeside.



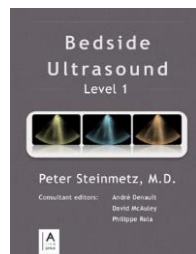
“Introduction to Bedside Ultrasound. Volume 1 + 2”.
Mallin and Dawson
Kan down-loades gratis på iTunes.



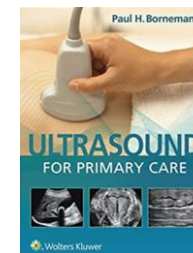
“Basal klinisk ultralydsdiagnostik”.
Munksgaard.
Christian Laursen og Ole Graumann.
Abonnement købes på Munksgaards hjemmeside.



“Fundamentals of Musculoskeletal Ultrasound”
Kan købes på Amazon.



“Bedside Ultrasound. Level 1”. Peter Steinmetz.
Kan købes på iTunes.



Ultrasound for Primary Care
Dr. Paul Bornemann
Kan købes på bl.a. Amazon og Saxo

INTERNETRESSOURCER



<http://www.thepocusatlas.com>



<http://5minsono.com>



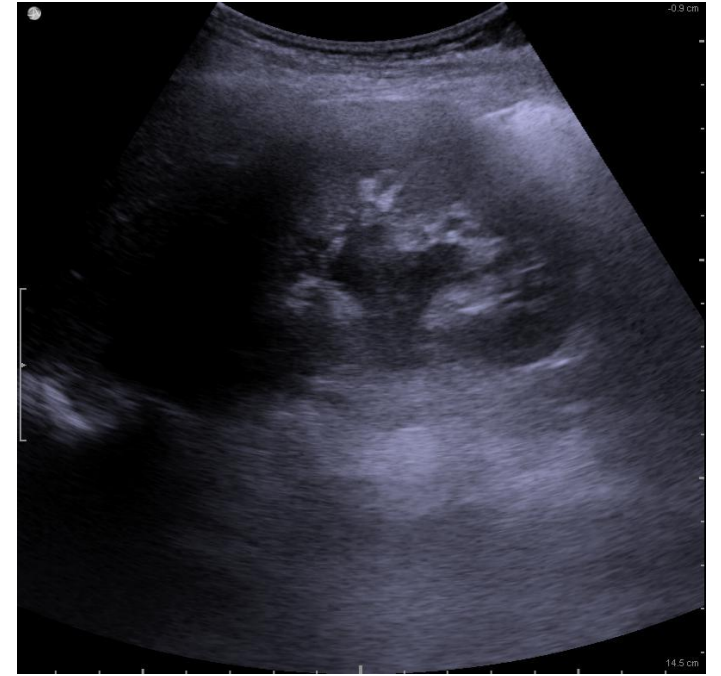
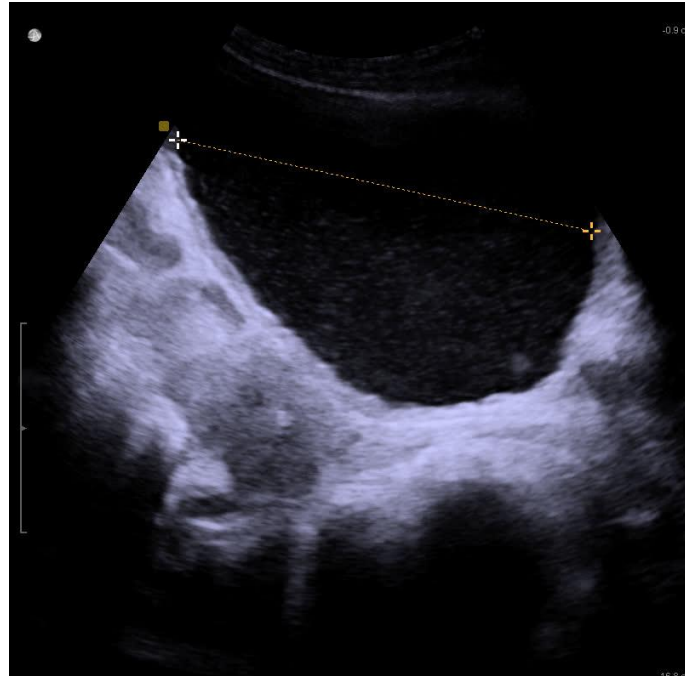
“Ultralyd i almen praksis i Danmark” (Lukket gruppe)



”DAUS” (Åben gruppe)

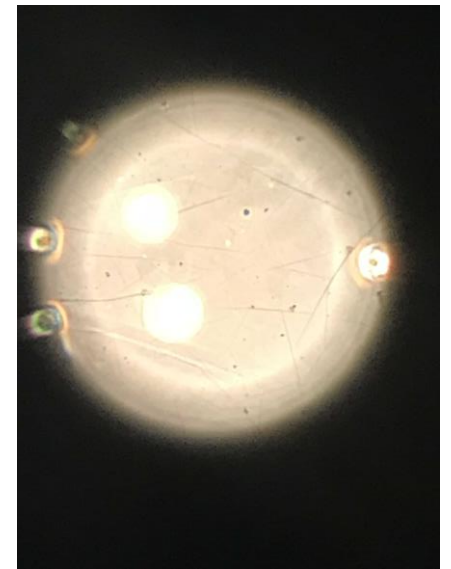
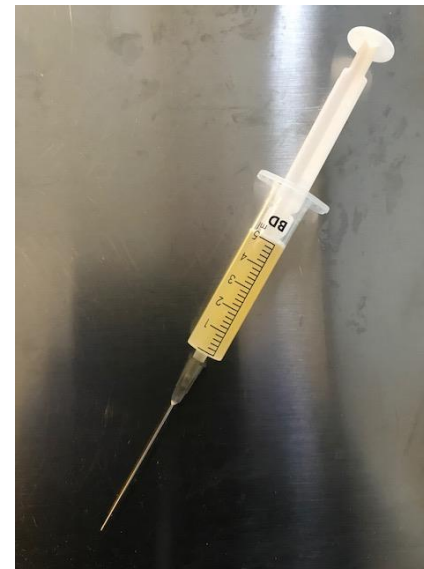
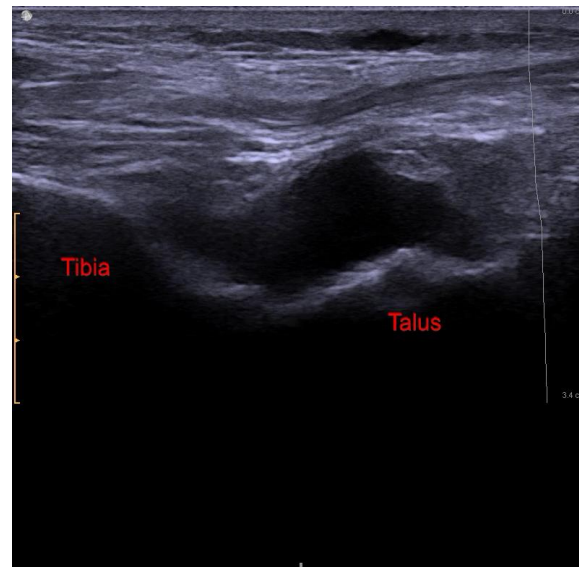
Patient case #1

Pt er i morfinbehandling for cervikale diskusprolapser. Obstiperet i 1½ uge. Nu 3 kilo vægtøgning over få dage.



Patient case #2

45-årig mand med smerter og hævelse af venstre ankel.



Patient case #3

80-årig kvinde med smerter i skulder
efter fald for 6 måneder siden

