



**Elective course**

**in**

**Musculoskeletal Ultrasound**

**(Valgfrit modul i  
Muskuloskeletal Ultralyd)**

**Master of Science in Physiotherapy, University of Southern Denmark**

**Version: January 22th, 2018**

**(Studieguiden er med forbehold for ændringer)**

### **Aim of the course**

The aim of this course is to make the students able to evaluate the opportunities in using ultrasound in diagnosing musculoskeletal disorder and evaluate the methodological quality of clinical health research investigating ultrasound.

### **Prerequisite**

The student should fulfil the prerequisite for being admitted to a Candidate in Physiotherapy, Chiropractic or Medicine.

### **Learning Outcome**

After completing the course the student is expected to have

*Basic knowledge and understanding of:*

- how to use ultrasound in diagnosing musculoskeletal disabilities
- evaluation of the methodological quality of published studies evaluating the use of ultrasound in clinical practice
- possibilities and limitation in using of ultrasound in diagnosing musculoskeletal disabilities and using ultrasound as clinical outcome.

*Skills to:*

- evaluate the validity and reliability of using ultrasound in diagnostics and as clinical outcome
- perform and present the analysis of investigating ultrasound as diagnostic tool and as clinical outcome.

*General competence to:*

- understand the possibilities and limitations of ultrasound in clinical practice
- understand and summarize research results from studies investigating ultrasound as diagnostic tool and as clinical outcome
- discuss the practical use of ultrasound as diagnostic tool and as clinical outcome.

### **Language**

The course will be held in Danish. However, if one or more of the participants/s do not speak or understand Danish sufficiently the teaching language will be English.

### **Teaching methods**

Teaching method will be based on action-learning processes, operationalizing and giving perspectives to the presenting theories. Lectures presenting central issues in ultrasound will be followed by individual and group exercises, theoretical as well as practical. All students are expected to participate actively in the exercises individually and in groups. The combination between lectures and exercises is expected to increase the student competences in using ultrasound as diagnostic tool and as clinical outcome, in addition to planning and performing studies in ultrasound.

## Guiding distribution of the workload

Course 5 ECTS. (5 ECTS x 27.5 hours = 137.5 hours).

Student workload

Lectures and exercises	28 hours
Preparation for lectures	69 hours
Written assignment	40.5 hours
Course workload	<u>137.5 hours</u>

## Course evaluation

The course in “musculoskeletal ultrasound” is evaluated by an internal evaluation based on a written assignment. The assignment must be written in Danish or English. The assignment will be evaluated with the 7-step scale.

## Assignment in Musculoskeletal ultrasound

The assignment is written and is delivered as one individual assignment. The assignment is not allowed to be more than max 12.000 points incl. gaps, excl. references and appendices, and must also follow the ”General rules for written assignments at Cand. Scient .Physiotherapy” (appendix 1). The assignment must be justified in relevant literature. The assignment is a self-selected case study, with focus on describing the evidence for and performance of an US examination of a patient with a specific pathological musculoskeletal condition.

**The assignment must be delivered at the latest date of .....**

## Criteria for comprehensive goal achievement

### Criteria for comprehensive goal achievement for the grade 12

The student is able to:

- evaluate the methodological quality in scientific studies investigating musculoskeletal ultrasound
- use the theory for describing and giving examples on when the current scientific method is relevant and how it should be used in practice
- understand and present a relevant analysis plan that can be used within musculoskeletal ultrasound, and give examples on pitfalls which have to be taken into account
- critically evaluate and interpret research results in musculoskeletal US
- show comprehensive understanding for which conclusions can be drawn from research studies within musculoskeletal ultrasound.

## Evaluation of the course

The evaluation will be performed in two ways. On the last lecture day the course responsible will have an evaluation session, where both the current course and different practical/pedagogical

aspects of the course can be discussed. Evaluation is also performed written by answering the electronic evaluation questionnaire, sent out by the course administration. The verbal and written evaluation will complement each other.

### **Course responsible**

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### **Program secretary**

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### **[Link til Mit Skema](#)**

### **Lecturers**

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- Julie Jacobsen, PhD-stud, PhD-stud., PT., VIA University Aarhus, email: [jsaj@via.dk](mailto:jsaj@via.dk)
- Marianne Christensen, PhD-stud, PT, Dep. Of Orthopedic Surgery, Aalborg University hospital, email: [mc@rn.dk](mailto:mc@rn.dk)

## Appendix for Educational plan

### Musculoskeletal Ultrasound

Upper extremities

**Week ...**

**1. date:... room...**

**kl 10-14** Welcome + Course-introduction (BJK)

General introduction to Ultrasound, US, (challenges in US) BHK mfl

Basic US in research (reliability and validity problems) (BJK)

US in Clinical practice, Helle Østergaard, Jeppe Bo Ekman (basic structures and US)

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

**Week ...**

**2. date:... room...**

**kl 10-14** PhD-stud, Cand.sc.physt, PT, Birgitte Hougs Kjær: 'Post-operative training of patients with rotator cuff rupture'. Basic measures (distances mm) and examples from US-studies in RTC-rupture-project.

PhD-stud., PT, Helle Østergaard: 'The diagnostic accuracy of ultrasonography in detecting rotator cuff tears in patients who sustained a proximal humerus fracture'.

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

**Week ...**

**3. date:... room...**

**kl 10-14** PhD, PT, Kim Ingwersen: 'Ultrasound assessment for grading structural tendon changes in supraspinatus tendinopathy: an inter-rater reliability study'.

PhD-stud, Cand.sc.san, Rad, Karen Brage, with the PhD-project: 'Development of elastography in Ultrasound to detect soft tissue characteristics and the sensitivity to change in shoulder patients'.

PhD-stud, Master in Sports PT, PT, Behnam Liaghat, with the PhD-project: 'Elasticity after progressive heavy versus light resistance shoulder training in patients with Joint Hypermobility Syndrome and shoulder pain – a randomised controlled study'.

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

**Week ...**

**4.date:... room...**

**kl 10-14**

PhD, MD, Thøger Krogh Persson: 'Ultrasonographic assessment of tendon thickness, Doppler activity and bony spurs of the elbow in patients with lateral epicondylitis and healthy subjects: a reliability and agreement study'.

PhD, senior researcher, PT, Karen Ellegaard: 'US at the hand – a European anatomic atlas'.

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

**Lower extremities**

**Week ...**

**5. date:... room...**

**kl: 10-14 Ultrasound of the knee**

Assoc.prof., radiologist, John Hjarbæk, Assoc.prof, MD, Jens Lykkegaard Olesen: 'Ultrasound of the knee in a sports medicine perspective'.

Presentation of criteria for the assignment v BJK  
practice assignment/case/review

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

**Week ...**

**6. date:... room...**

**kl: 10-14** Phd-stud, cand.chir, Stine Haugaard Clausen: 'Ultrasonography in Hip impingement syndrome'.

PhD-stud, PT, Julie Jacobsen: 'Muscle-tendon related abnormalities detected by ultrasonography are common in symptomatic hip dysplasia'.

Demo+ practice

**Recommended literature:**

**Supplemental literature:**

Week ...

7. date:... room...

kl 10-14

PhD stud, PT, Marianne Christensen: 'Ultrasound measurements of Achilles tendon properties in Achilles tendon ruptures - Including ultrasound length measurements with skin markings, Extended Field of view and diagnostic measurements for Achilles tendon rupture.'

PhD-stud, cand.sc.fyst, PT, Charlotte Anker-Pedersen: 'Achilles- and patella tendon thickness and collagen structures in professional balletdansers before and after rehearsal and performance of the Swan Sea.'

Demo+ practice

**Recommended literature:**

**Supplemental literature**