ESESMIR

11th Conference of ESES in Izmir 2025

22-24 May

@Wyndham Grand Özdilek İzmir

# Thyroid Ultrasound & Artificial Intelligence for Evaluation of Thyroid Nodules, Hands-on Course

**Directors and Tutors:** Güldeniz Karadeniz Çakmak, Ali Uğur Emre, Düzgün Yıldırım, Carmela De Crea

## Course Description

This case-based module is designed to introduce learners to office-based ultrasound examination of the thyroid glands and related pathology. During this course, learners will review how to examine and stratify thyroid nodules based on their sonographic features (TIRADS) and determine when further evaluation, such as biopsy, is indicated. The distinction of normal from malignant nodule is emphasized with a demonstration of the comprehensive video-based multimodal sonographic imaging and AI. In these presentations, the most recent developments regarding AI in thyroid nodules, the expected potential developments will be explained with plenty of examples, and the advantages of using advanced current AI programs will be discussed.

The process of ultrasound guided FNA of thyroid nodules is demonstrated in didactic lecture format. In addition, practical sessions allow the surgeon to learn varied techniques of FNA of lesions in phantom models.

The use of volunteers with thyroid pathology will allow supervised hands-on experience with transverse and longitudinal ultrasound methods. Participants will be instructed in the practical details and hurdles in developing office-based ultrasound.

## Learning Objectives

Upon successfully completing this course, participants will be able to:

- Illustrate the fundamental operation of appropriate thyroid ultrasound equipment
- Provide a concise overview of the basic physics and principles for thyroid ultrasound
- Gain proficiency in thyroid ultrasound scanning methods and exhibit them.
- Describe thyroid nodule sonographic features
- Determine if a biopsy is indicated based on the nodule's risk of malignancy
- Understand the utility of AI in thyroid nodule evaluation
- Demonstrate ultrasound-guided interventional procedures on thyroid phantoms/models
- Explain how to integrate thyroid ultrasound into a surgical practice

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Additionally, this program will encompass essential aspects of intervention for diagnosis, fine needle aspiration biopsy, and the application of artificial intelligence through a combination of theoretical and practical modules. Our expert faculty will also provide insights based on their personal experiences in integrating thyroid ultrasound into surgical practice.

**Educational Methods**

- Plenary lectures
- Workshops on the use of US and US-guided thyroid biopsies
- Video-based discussion sessions- step-by-step

**Main Topics**

- The basics and principles of thyroid ultrasound
- Recognize normal and abnormal variation in thyroid ultrasound examination
- Use of thyroid US findings for diagnostic and therapeutic purposes
- Demonstrate ultrasound-guided interventional procedures on thyroid phantoms
- AI for evaluation of thyroid nodules

**Target Audience**

- Trainees in endocrine surgery, radiology, endocrinology and surgical oncology
- General surgery residents interested in neck surgery
- Specialist endocrine surgeons and endocrinologists

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## I - Theoretical Session

**14.30-14.35** *Opening*
Güldeniz Karadeniz Çakmak, Ali Uğur Emre, Düzgün Yıldırım, *Carmela De Crea*

**14.35-14.50** *Introduction to Ultrasound Physics/Principles and Sonographic Thyroid-Perithyroid Neck Anatomy, TI-RADS categorization, AI assisted -noduleevalation*
Dr. Düzgün Yıldırım

**14.50-15.00** *Sonographic Assessment of Thyroid Nodules*
Dr. Güldeniz Karadeniz Çakmak

**15.00-15.15** *Techniques to Optimize Fine Needle Aspiration Biopsy*
Dr. Ali Uğur Emre

15.15-15.30 Q & A

15.30-15.45 Break

## II - Workshop with models/phantoms: Hands-on Session

15.45-16.00 **All participants** Basics of Ultrasound Device: The Fundamentals of the Ultrasonography

16.00-16.30 **Group I** Thyroid Ultrasound on Live Model

16.30-17.00 **Group II** Ultrasound guided FNA on Phantoms

17.00-17.30 **Group III** AI

17.30 *Feed-backs and adjourn*