

## **LEAD program**

### **Imaging techniques and evaluation of Cystic Fibrosis (CF) Lung Disease**

Organising Committee: HAWM Tiddens, MD, PhD and P Ciet, MD

#### Day 1 (12 March 2015)

##### **Afternoon**

##### **Arrivals**

18.00 - 18.15              Welcome Prof. Harm Tiddens (MD, PhD)

18.15 - 18.45              Introduction of the course: Chest imaging in CF - where do we stand?

Aims: To give an overview of where we stand concerning chest imaging in CF

Learning objective: At the end of this presentation the participant is well aware of the most relevant validation studies related to the use of chest CT and chest MRI in CF

18.45 - 19.00              The program of day 2

##### Aims:

- To explain the program of the next day and to share the following learning objectives for the course.
- To introduce the staff
- To explain that question cards will be handed out to the participant that they can use to write down their specific questions. Question cards will be collected at the start of day 2 and during the rest of the day. When not addressed during the program they will be addressed during the panel discussion at the end of the day.

##### Learning objective course:

At the end of this one day course the participants:

- Have learned the basics of chest Computed Tomography (CT) technology
- Are aware that the risk of chest CT is low when the ALARA principle is applied
- Are motivated to implement volume control for chest CT and/or chest MRI
- Understand what series need to be stored and why
- Understand the basics of chest Magnetic Resonance Imaging (MRI)
- Have experienced how to execute spirometer controlled chest MRI and chest CT
- ..... several methods to change quantify chest images into numbers that count

## Day 2 (13 March 2015)

### 8.30 – 10.15 Chest CT: the basics

- CT technology: Marcel van Straten (CT Physicist, PhD) (20 min ppt 10 min Q&A)
  - Objectives: At the end of this presentation the participant understands the basic principles of modern CT technology relevant for making chest CTs
- Radiation in perspective: Wieying Kuo (MD, PhD student) (10 min ppt 5 min Q&A)
  - Objectives: At the end of this presentation the participant understands the basics of radiation risk and how big the risk is related to the use of chest CT as a monitoring tool for CF lung disease
- Standardization of CT scanning protocols: Mariette Kemner vd Corput (PhD) (10 min, 5 min Q&A)
  - Objectives: At the end of this presentation the participant understands how CT protocols can be standardized
- Reconstruction techniques: Marcel Dijkshoorn (Radiographer, CT technician) (10 min, 5 min Q&A)
  - Objectives: At the end of this presentation the participant understands the process of image reconstructions and is aware that the proper series should be saved before RAW data are being deleted
- Volume standardization: Harm Tiddens (MD, PhD) (10 min ppt 5 min Q&A)
  - Objectives: At the end of this presentation the participant understands that lung volume needs to be standardized during imaging to maximise diagnostic yield

### 10.15 - 10.45 Tea/Coffee

### 10.45 - 11.45 Chest MRI: the basics

- MRI technology to image the lungs in a nutshell: Piotr Wielopolski (MRI Physicist) (20 min ppt 10 min Q&A)
  - Objectives: At the end of this presentation the participant understands the basic principles of modern MRI technology relevant for making chest MRIs
- The moving lung: Pierluigi Ciet (MD, PhD student) (15 min ppt, 5 min Q&A)
  - Objectives: At the end of this presentation the participant has seen examples to illustrate the great potential of chest MRI to study the moving lung

### 11.45 – 13.00 Image analysis of chest CT and MRI: the basics

- Image analysis: Scoring and beyond: Harm Tiddens (MD, PhD) (15 min ppt 5 min Q&A)
  - Objectives: At the end of this presentation the participant understands the basics of scoring and (semi) automated chest image analysis

- Automated image analysis: The hurdles: Adria Perez Rovira (Physicist) (15 min ppt 5 min Q&A)
  - Objectives: At the end of this presentation the participant is well aware of the hurdles that should be overcome to optimise automated image analysis

13.00 - 13.30 Lunch

13.30 – 14.30 Hands-on training (round 1)

- Group I: LungAnalysis (3 work stations PRAGMA, CF-CT, Airway artery ratio). Mariëtte Kemner vd Corput (PhD, Head LungAnalysis)
  - Objectives: At the end of this workshop the participants have seen the CF-CT training module; how PRAGMA is executed; How the Airway-Artery method works
- Group II: Spirometer controlled MRI/CT: A Hands on experience. Pierluigi Ciet (MD) and lung function technician
  - Objectives: At the end of this presentation have seen and experienced the challenges of executing a spirometer controlled MRI or CT

14.30 - 14.45 Change

14.45 - 15.45 Hands-on training (round 2)

- Group I: Spirometer controlled MRI/CT: A Hands-on experience
- Group II: LungAnalysis (3 work stations PRAGMA, CF-CT, Airway artery ratio)

15.45 - 16.15 Tea/Coffee

16.15 - 17.30

- How to go systematically over a chest MRI and CT of a CF patient: Pierluigi Ciet (15 min ppt 5 min Q&A)
  - Objectives: At the end of this presentation the participant has learned the basics of how to evaluate a chest CT or MRI in a systematic way. To do so radiologist Ciet will go over 3-4 cases (3 CT, 1 MRI) with the participants
- Panel (Harm Tiddens, Pierluigi Ciet, Marcel van Straten, Piotr Wielpolski) discussion of remaining questions handed in on cards (45 min Q&A)
  - In this session we will discuss remaining questions by the participants that have not been addressed during the course.
- Closing remarks: What have we learned from the course? Harm Tiddens (ppt 10 min)

## **LEAD program – Faculty**

### **Imaging techniques and evaluation of Cystic Fibrosis (CF) Lung Disease**

#### **Organising Committee:**

- HAWM Tiddens, MD, PhD
- P Ciet, MD

#### **Faculty:**

- Harm Tiddens, paediatric pulmonologist, MD, PhD
- Pierluigi Ciet, PhD student, MD
- Marcel van Straten, medical physicist CT, PhD
- Wieying Kuo, PhD student, MD
- Mariëtte Kemner van de Corput, Head LungAnalysis, PhD
- Marcel Dijkshoorn, Radiographer, research technician CT-scan
- Piotr Wielopolski, MRI Physicist
- Adria Perez Rovira, Physicist