

ANZSRS Advanced Education Grant 2017 – Michael Beaven (M00696)

Course attended: ERS Clinical Exercise Testing: Advanced

Date: 22nd – 23rd February 2018

Location: Rome, Italy

Background

This Clinical Exercise Testing course was run by the ERS and was aimed at Pulmonologists, Physicians, Clinicians, Scientists and Physiologists who regularly practice Cardiopulmonary Exercise testing.

The discussion panel included a cohort of very well established Physicians, Researchers and Specialists, each with their own separate interests in CPET.

I would like to thank all those involved in the organisation, selection and awarding of the ANZSRS AEG. Providing this opportunity for professional development has helped me to expand my knowledge, and to take home with me a wealth of new and improved ideas to share with my colleagues, managers and members of the like. I believe through the information gained from this course, we have been able to strengthen the knowledge base of the service and facilitate the growth as a forward-moving Pulmonary Physiology Laboratory.

Key Learning Objectives

This course was focussed toward the normal physiological and pathophysiological response patterns that can be observed during cardiopulmonary exercise testing. Sections included the normal metabolic, ventilatory and cardiovascular responses to exercise, as well as the parameters to be looking for to identify a normal response pattern. Following this, there were some very interesting sessions on the abnormal response patterns to exercise, trends and relationships to look for in order to identify the underlying or strongest contributor to exercise limitation or breathlessness. There were also practical demonstration sessions as well as small workshops on some of the scientific nuances found through CPET, e.g. identifying the “anaerobic thresholds”, or rather understanding which anaerobic thresholds are relevant to the clinical question.

Take-home messages

Whilst all of the information provided was rich, niche and interesting, there were a few key areas that resonated with me that I have attempted to bring into practice in the FSH Pulmonary Physiology Laboratory:

- VO_2/WR relationship – is a good indicator for cardiovascular limitation to exercise, unless otherwise explained by oxygen perfusion issues, this can give one a general feel for the cardiovascular performance during exercise. I believe this is a good reason to be using an exercise modality with good control over the work rate (mechanically).
- VE/VCO_2 relationships – mathematically, the V_E/VCO_2 gradient attained during a maximal exercise test is equal to the nadir observed in the $EqCO_2$ vs time tracing. Additionally, the

VE/VCO₂ relationship gives good indication on the work of breathing, dead space ventilation, and may help towards disseminating exercise limitation due to pulmonary hypertension (normal P_{et}CO₂ with elevation in EqCO₂)

- EELV and IC – I learnt that respiratory limitation to exercise isn't simply looking at the tidal volume tracing against the maximal flow-volume envelope, but a respiratory limitation due to elevation in EELV and reduction in IC is important to look for. As the EILV approaches TLC, evidence suggests that a patient will feel symptomatically more breathless due to the reduction in IC.

Dissemination of Information

In late September 2018, I gave a presentation on the normal exercise response to the Local WA ANZSRS cohort via video conference. For completeness, I have attached the slides of this presentation to the accompanying email.

Additionally, a number of the take-home messages were discussed with management on my return from the course for implementation into the CPET service offered at the FSH Pulmonary Physiology Laboratory. I am pleased to report that these suggestions have been discussed, modified, accepted and successfully integrated into the service. They have provided as great learning tools for the team I work in, and we all continue to grow and learn from the experiences we share with each other.

Thank you again for your time, and for the incredible opportunity.

Sincere Regards,



Michael Beaven