Systematic Review & Meta-analysis of Interventional Clinical Trials:

	Topic	Date	Hours
Systematic Review			
Day 1	Introduction	Wed 16 Dec: 7 – 9 PM	2
Day 2	Searching	Mon 21 Dec: 7 – 9 PM	2
Day 3	Selecting studies - Protocol registration	Wed 23 Dec: 7 – 9 PM	2
Day 4	Quality assessment	Mon 28 Dec: 7 – 9 PM	2
Day 5	RoB-2	Wed 30 Dec: 7 – 9 PM	2
Day 6	Practice on quality assessment	Mon 4 Jan: 7 – 9 PM	2
Meta-analysis			
Day 1	Logic behind MA – Choosing ES	Wed 6 Jan: 7 – 9 PM	2
Day 2	Weighing ES – Testing homogeneity – Fixed & random models	Mon 11 Jan: 7 – 9 PM	2
Day 3	Assessing risk factors – Sensitivity analysis – Publication bias - Certainty of Evidence	Wed 13 Jan: 7 – 9 PM	2
Day 4	Practice	Wed 18 Jan: 7 – 9 PM	2

Systematic Review and Meta-analysis

One study can never be enough to provide adequate evidence. Systematic review does not simply summarize the results of the previous studies, but it analyzes the evidence provided by each study to draw meaningful and statistically valid conclusion (Meta-analysis). Each year the number of published systematic review & meta-analysis is increased reaching up to 28,959 systematic review & 9,135 meta-analysis by 2014. However, with the increased number of published studies comes the risk of low-quality studies which creates a threat on implementing the results of these studies in daily practice. Thus, knowing how to conduct & how to assess the quality of systemic reviews & meta-analysis is essential for proper evidence based medical practice.

Systematic review:

- Difference between narrative and systematic review
- Features of systematic review
- Limitations of systematic review
- Conducting a systematic review:
  - Formulating a research question
  - Building up your search strategy
    - Different information resources
    - How to conduct an electronic search
  - Using reference management software for filtering literature
  - How to register your systematic review protocol
  - Using Rev manager to build up your systematic review
  - Quality assessment
    - Assessing different risk of bias of clinical trials
    - Risk of bias tool 2 for clinical trials
- Items of PRISMA Checklist for optimal reporting of systematic review and meta-analysis

Meta-analysis:

- Basic statistical concepts:
  - Mean, standard deviation and standard error of mean.
  - Confidence intervals of subject, confidence intervals of mean and confidence interval of a difference.
  - Analysis of variance: introduction, One-way ANOVA
  - Regression analysis: introduction, simple regression, ANOVA table.
- Logistic behind meta-analysis.
- Basics of meta-analysis
- Effect size

- Basic characteristics
- Calculation of common Effect size: standardized mean of the difference, Absolute risk difference, Odds ratio and Relative risk
- Computing the unbiased EF
- Weighting by inverse variance

- Pooling of effect size, calculation of standard error, confidence interval of mean and testing statistical significance.
- Testing heterogeneity, Q Statistics, statistical significance and I2
- Fixed versus random model:
  - Choosing the appropriate model for your study and logic behind each.
  - Execution of meta-analysis by hand and basic calculator
  - Application of both models on Meta analyst software (free download).

- Moderator analysis:
  - Categorical moderator (subgroup) analysis
  - Meta regression analysis.
  - Application on Meta-analyst software
- Publication bias
- Sensitivity analysis
- Certainty of Evidence (GRADE)

Application:

- Searching strategies rules
- Using Mendeley (Reference Manager) in systematic review
- Quality assessment of published articles
- PRISMA tool
- GRADE Website
- Meta-analysis software