



1 st year:	Module 4
Module Title:	Systematic Reviews
Number of Credits:	6 EC
Module Leader:	R. Elbers, PhD
Lecturers:	G.S. de Wolf, MSc / S.I.B. Perry, MSc / M. Leeflang, PhD

Overall Aim & Synopsis

The general focus of this module is to achieve advanced understanding of the principles, methods and techniques of Systematic Reviews.

Session 1: Concepts of Systematic Reviews

Lecture

The technique of systematic reviews will be introduced at the hand of which clinical questions it can answer. Focus of this session will be the validity (study selection) and reliability (data extraction) of the review as a whole and the impact thereof for recommendations (GRADE).

Tutorial

Groupwise exercise with study selection; exercise with data extraction; exercise with data manipulation; exercise with data pooling; interpretation of results and critical reflection on procedures (GRADE)

Learning objective

The student has elementary knowledge of the validity of study selection and reliability of data extraction for a systematic reviews.

Session 2: Techniques of data-analysis

Reprising on previous lecture, the principles of appropriate data-pooling will be introduced. Different pooling techniques – e.i. fixed effect, random effects, protocolized sub-analyses, and meta-regression – will be discussed in detail in light of homogeneity (or lack thereof) of inter-study results. Techniques of identifying and addressing heterogeneity, clinical and statistical heterogeneity, quantifying heterogeneity and exploring heterogeneity will be discussed.

Tutorial

Using the Metafor-package for R, RStudio will be used to perform data-pooling using different analytical techniques (fixed effect model, random effects model, sub-groups effects, MRA). The impact of each technique on interpretation of results will be discussed (GRADE)

Learning objectives

The student is able to determine the value of performing a meta-analysis following a systematic review.

The student is able to determine and account for heterogeneity.



Session 3 Validity of results

Lecture

Validity of the review will be discussed. A distinction will be made between the validity of the procedures of the review (e.g. language, database & publication bias) and validity of the underlying literature (internal validity, reporting bias). Different tools to identify Risk of Bias will be discussed.

Tutorial

Applying different tools for identifying potential Risk of Bias

Learning objectives

The student knows how to assess validity of an individual study (for reviewing purposes), knows how to assess validity of a systematic review, and knows how to apply these assessments in the interpretation of the general results.

Session 4 Systematic reviews of diagnostic test accuracy studies.

Lecture

The lecture will focus on measures of diagnostic test performance (sensitivity, specificity, likelihood ratios, diagnostic odds ratio), quality assessment of diagnostic studies, criteria of internal and external validity, data-extraction and meta-analysis of diagnostic studies, threshold effects, heterogeneity and different forms of summary receiver operating characteristic curves.

Tutorial

Analysis of the results of a systematic review on diagnostic test accuracy, using R-Studio and the Metafor-package.

Learning objectives

The student knows how to assess and perform a systematic review of diagnostic studies and knows how to interpret the results.

Session 5 Putting it all into Perspective

Lecture

The lecture will point out known pitfalls and limitations of the technique of systematic review (e.g. ecological fallacy, duration of the process, limitations within the literature, scope of the module) and will discuss different potential solutions to these limitations. The lecture will give a scope on the GRADE method for drawing recommendations.

Tutorial

Applying the GRADE method on the results of a systematic review and formulating recommendations.

Learning Objectives

The student knows how to rate the quality of evidence for intervention studies using GRADE.