

Critical Appraisal Syllabus

The Critical Appraisal Section will test the candidate's knowledge and understanding of:

Concepts of evidence based practice

This includes:

- the scientific principle
- the evidence hierarchy attributed to different study designs
- grading of scientific evidence
- the principles of the CONSORT and STROBE consortia in reporting clinical trials and observational studies
- the relevance and applicability of scientific information to clinical practice.

Study type and study design

This includes:

- the most appropriate research designs to examine hypotheses
- the epidemiological study sequence
- the limitations and strengths of research methodologies
- the strengths and weakness of different study designs including cross-sectional, prospective and retrospective observational studies, case-control studies and cohort studies and randomised and non-randomised controlled trials, parallel groups, split-mouth, matched pair and crossover designs systematic reviews and meta analysis
- questionnaire design
- quantitative and qualitative studies
- use of techniques such as interviews, focus groups, transcripts of narrative material
- concepts of randomization and stratification
- the potential sources of bias and error in study design
- basic epidemiological terms, including prevalence and incidence
- issues of research ethics as they apply to study conduct.

Concepts of bias and confounding

This includes:

- sources of bias; selection bias, measurement bias, observer bias, publication bias, recall bias, allocation bias
- controlling for bias
- blinding
- confounding
- controlling for confounding via study design
- accounting for confounding via statistical analysis.

Basic statistical concepts

This includes:

- the validity of the sample
- inclusion and exclusion criteria
- sample size estimation
- Type I and Type II errors
- confidence intervals
- probability and correlation coefficients
- interpretation of results from common statistical tests used for parametric data (e.g. t-tests, analysis of variance, multiple regression) and non-parametric data (e.g. chi squared, Mann-Whitney U).
- interpretation but not calculation of: odds ratios and relative risk

- sensitivity and specificity as they apply to diagnostic tests and receiver operator characteristic (ROC) curves.
- interpretation of Forrest and Funnel plots as presented in systematic reviews and meta-analyses.
- the concept of intention to treat analysis.

Evaluation of research findings

This includes:

- issues of internal and external validity of a study
- statistical vs clinical significance
- appreciation of experimental vs field trials
- the concept of number needed to treat
- appreciation of primary and secondary (surrogate) outcome measures
- risk/benefit considerations
- application (generalisability) of study findings to local populations.