



GUIDANCE ON
RESEARCH DISSERTATIONS
WRITTEN FOR PURPOSE

April 2008

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INTRODUCTION

This guide has been written as an aid to trainees intending to undertake and submit a piece of primary or secondary research or substantial audit under Membership Regulation M12(a), for whom it assumes the perspective of a trainee in UK higher specialist training, enrolled under the new curriculum (after 31 July 2007). However, much of the advice will also be useful to other candidates, including old curriculum trainees and those embarking on a university degree that may lead to submission under Regulation M12(c). It should be read as advice and not be seen as a substitute for the specific Regulations, nor should it be used inflexibly or be seen as the only way to achieve the objective. Each dissertation is unique.

The key to success lies in the planning, which will probably require your intermittent attention throughout the early period of training. There is an understandable tendency to concentrate on passing the examination components of Membership and to leave considerations of the dissertation until the later stages of training. This is unwise; you should start to think about your dissertation during the first year of training (generally ST3). Experience suggests that developing a good idea and laying the foundations for a good study take time. In any event new curriculum trainees will need to submit a completed dissertation before they can sit the Part 2 Membership examination and enter ST6 (usually before their fourth and final year of training), so a delay in submission could mean a delay to completion of training.

Try to familiarise yourself with the current areas of research in occupational medicine and with the methods that are used. Then try to match this with your own interests and questions about occupational medicine and occupational health practice. Discuss the question you have in mind with experienced colleagues, including those with knowledge of research. This will also help you with your preparations for the examinations.

The standard being sought is that of a university-assessed MSc or peer-reviewed research publication. Candidates often seek academic support and this is strongly encouraged.

PICKING A TOPIC

The choice of study is largely up to you, as long as you satisfy regulations M11 and M14 (for old curriculum trainees, in post before 1 August 2007, regulations M53 and M55) – the topic should demonstrate competency in research methods in line with the Faculty's Higher Specialist Training Curriculum and should normally be within the broad field of occupational health. Ideally, your study should contribute usefully to the evidence base of the specialty. (There are many gaps in our research base and other areas where findings require confirmation, so it is unlikely that any proposal will be rejected solely on the basis of lack of novelty.)

Research ideas commonly arise from

- Everyday questions about practice
- Observed variations in practice
- Challenging/checking accepted practice, where it lacks an evidence base
- Topics of debate and controversy
- Apparent gaps in the evidence base

Such topics may arise naturally out of a question during your work or may feature in the editorial and letter columns of journals, the presentations of meetings, and the discussion forums of special interest groups. Studies based on an outcome of practice have the benefit of being of interest to the employer as well as to the specialty.

Another aspect of evidence-based practice is reviewing the results of studies published in the literature. A literature review (secondary research) is an acceptable topic for submission, but the same degree of rigour will be applied when assessing your final submission. You will need to explain why you are undertaking the review and what methods you will use to select and then critically appraise the published studies. Good reviews begin with very clearly defined questions. They are systematic in their methods and apply precise rules that others could also follow with the same result – eg, defining databases, periods of inquiry, inclusion and exclusion criteria, key search terms and quality assessment criteria. They also spell out the strengths and weaknesses of the chosen method and the implications for practice and/or future research. Familiarise yourself with the process and the standard.

Finally, you might consider conducting and reporting a substantial audit on a topic relevant to your occupational health practice or the health and safety arrangements of your employer. This should meet the general standards of a research dissertation, and should thoroughly evaluate the background literature, formulate a well-defined study question(s), define and employ appropriate methods and measures, include an appropriate statistical analysis, draw sensible conclusions, and propose (and ideally implement and evaluate) suitable follow-on actions and changes of practice. The standard should be **no less** than that of work submitted in another permissible category.

SUBMITTING THE OUTLINE PROPOSAL

This guidance relates to regulation M24 (for old curriculum trainees Regulation M64). You should discuss your thoughts about the dissertation with your educational supervisor. They will be an important source of professional advice and an important link with the management structure of your employing organisation. If your study will involve access to workers and workplaces you will be advised about what is feasible within the organisation. You can identify and discuss any ethical issues and ensure that the necessary resources will be made available to you.

Once your study has evolved to be more than just thoughts you must focus your attention on how you are going to conduct the study. You must pay a lot of attention to this aspect of the proposal. It is probably a good idea to discuss your proposals with someone who has some experience in research: an academic at your nearest university, an epidemiologist or a statistician, depending on what you are going to do.

The initial proposal should explain the rationale for the study and explain how you are going to do it. In a nutshell:

- ◆ What are you going to do?
- ◆ Why do you want to do it?
- ◆ How will you do it?
- ◆ Who will be involved?
- ◆ Where will it happen?
- ◆ When are you going to do it?
- ◆ How will ethical issues and permissions be handled? (eg, Do you have access to the study population and the agreement of line managers? How will you address data confidentiality?)

Formulate a clear question that you wish to answer. Thinking about how you answer the question will help you to identify the factors that you need to take into account when interpreting the results.

Be as precise as possible when defining study groups, diagnostic categories, measurements of exposure, or any statistical methods that you envisage using.

Be realistic about what you are hoping to achieve. Are you likely to recruit enough people or obtain a sufficient number of measurements? Will there be enough time for the study? What sort of things might go wrong? How will you address these problems? A plan of work and timeline will help you prepare. Try to ensure you include enough information in your outline to show that your project is properly considered and feasible.

The outline proposal must be submitted to the Chief Examiner (Research Methods) before you go any further. **The Faculty recommends an initial proposal be submitted no later than the 18th month of full-time training (or part-time equivalent).**

The submission of the outline proposal is a rapid screening process. The purpose is two-fold: (i) to provide a quick response to the minority of candidates whose proposals clearly do not meet the requirements, and (ii) to offer some informal advice on improving the protocol. Necessarily, such advice will be limited; the Faculty cannot issue detailed and iterative advice: it will be up to the candidate to flesh out and develop the full detail of their proposal at a later stage, with the help of their supervisor or academic advisors. Outline approval is a quick filter and not a guarantee that your assessors will accept the final submission as of a satisfactory standard.

WRITING THE DISSERTATION

If you are in higher specialist training, your educational supervisor must be involved, and will be a valuable source of advice and encouragement. Occasionally it may be necessary to adjust the direction of your work and if so you may wish to propose a revised outline to the Chief Examiner (Research Methods).

The dissertation should be written in a similar fashion to a scientific paper. It will have gone through a similar gestation period and will have followed the same developmental processes. The assessors will view your dissertation as would journal referees. The main difference is that your dissertation will not be as constrained in length as a journal article and may only be read by a small number of people. The dissertation should be written in clear, good quality English. The presentation will also be taken into account. Layout, word-processing and any diagrams, tables and photographs must be clear, tidy and well laid out.

Most projects can be reported in sections under the following headings:

Summary or Abstract
Preface/acknowledgements
Introduction
Methods
Results
Discussion
References
Appendices (if appropriate)

Subheadings within these sections should be used where appropriate to aid clarity and understanding.

Introduction: This should describe the basic problem in the context of your industry/factory/workplace leading to a review of the literature, highlighting current knowledge, previous investigations and any conflicting evidence. Strengths and weaknesses of previous investigations and their methodology might be identified. A clearly defined aim for your project should emerge naturally from this assessment; if possible it should be consolidated into a single sentence. Assume the reader does not know anything about the subject.

You should have collected the relevant references and be familiar with their content and applicability to your work, but you need not use all of them, especially in the introduction (the discussion section will normally include a comparison with other findings and another opportunity for expansion). Plan carefully how you use and index citations; you should have seen and read every reference you cite. Ensure that you attribute references correctly, reporting findings or results rather than speculation - unless this is appropriate. Are your references a primary source of information or do they quote others?

Methods: This section will describe in detail the methods used to investigate the problem. It will identify the what, how, and when of the data collected, the subjects and their selection (if appropriate), comparison populations and the reason for their selection. Investigations should be defined - again who, where, when, how are the questions to be addressed. Use of questionnaires should be stated together with justification or validation. Ethical issues, permission/consent, and co-operation from management and trade associations should be covered if appropriate to your investigation. This section should also address the analysis of your data; the methods or tests to be used, justification for the number of subjects to be used; an assessment of the power of your study may be appropriate, together with your strategy to minimise errors and biases. Finally, what external assistance will you be using? Analysis of data and samples are two obvious examples where you may need extra help; this is allowed

with acknowledgement.

Results: These must be presented in the most appropriate form. Extensive use should be made of tables, or figures and graphs when these convey the message better. A narrative of the results should be restricted to highlighting the most important results and should refer the reader to tables etc rather than simply repeat in word form what may be obvious from tables. However, certain differences, say between subjects of interest and referents, or other important comparative information, should be identified briefly - if only to direct the reader to a specific table. A clear statement should be included on the findings in relation to your study question(s).

Discussion: Try not to repeat your description of results in this section, other than by way of a brief summary or drawing together of the threads. Instead, your discussion should compare your findings with previous work and should identify the strengths and weaknesses of your study compared to others. Methodological problems should be discussed and their likely influence on your results, focusing on such things as measurement error, confounding, biases and statistical uncertainty. Speculation may be appropriate on the reasons for unexpected findings. Finally, you will have to draw the discussion to a close and make firm conclusions on your work. These may be strongly positive, inconclusive or even negative. Have you achieved your aim? How can your findings be applied? Is further work required, or can you make recommendations for practice?

References: These should be in the Vancouver style; remember it is quality and relevance of references that count, not quantity.

Appendices: These may be required to record supplementary analyses of background interest or other information, which would be inappropriate in the text of your dissertation, eg, study questionnaires, Approved Codes of Practice, procedural documents.

Abstract: The abstract should be written last. In it you should consolidate the most important features of the work including the objective, a very brief summary of the methods and principal results, conclusions and recommendations (use of structured headings is advisable). It is an exercise in self-control and good writing to achieve this within a limit of 250-300 words, but it can be done. Many of the papers read in pursuit of your dissertation will have abstracts of varying quality and so you should have an idea of what makes a good abstract and which features to include and which to avoid.

Style: The dissertation should be written concisely in good English. Use a thesaurus to avoid repetition. Sentences should be short, precise and of simple construction. (It is a good discipline to go through the text carefully thinking about this, and whether some sentences of tangential relevance could be removed altogether – less is often more!)

You should avoid jargon (both medical and 'management') and unnecessary convolution. Where abbreviations are required they should be written in full the first time and followed by the abbreviation in brackets. Subsequently the abbreviation should be used, eg, Health & Safety Executive (HSE). Follow the normal conventions of scientific writing including standard units of measurement. Tables and figures should be numbered and should have a title. Large tables and figures should be placed on individual pages adjacent to the relevant text. The table of contents and page numbering must be accurate. Citations must be

accurate and in the correct style. Each main section should start on a new page.

The essence of a good paper or dissertation lies in its readability. It should be a pleasure to read. If its style is difficult to read, then its message will be hidden and the sympathy of the reader lost. Scrupulous attention to detail must be the watchword at every stage. Proof reading is essential. Get others to proof read it too, including someone divorced from the subject at hand (even a layperson); a fresh pair of eyes may spot where the sense or logic is flawed. Remember that word-processor spellcheckers will not pick up on inappropriate spellings of words (e.g. principal/principle).

SUBMITTING THE FINAL DISSERTATION

Following receipt of your final submission, the Faculty will appoint two independent assessors to evaluate your work (usually, these will be specialist occupational physicians).

Within about 2 months of assessors being recruited you should receive written feedback on the assessors' views. They may recommend acceptance without revision, or require minor or substantial revision, or (occasionally) may fail the work outright. *Most dissertations require revision* and you should expect this – it is not a mark of failure but a part of the learning process.

The assessors will issue written guidance on the points that need correcting or additional work that needs to be undertaken, and you will be required to submit a revision within the timetable they outline. Many assessors contact candidates personally to offer further informal advice, and it is not unreasonable that you contact them should any points at issue seem unclear. Experience suggests that the revision stage often takes about 3 months to reach a natural conclusion, and that relatively few candidates ultimately fail to reach the required standard.

A provision exists in the regulations for you to appeal a decision to reject or substantially revise your dissertation. This is because the Faculty recognises that weighing the merits of primary and secondary research can be challenging for assessors, just as the conduct and writing of it can be for candidates. However, you should **only** exercise this option when reasonable avenues of conciliation and discussion with your assessors (involving also your educational supervisor or academic advisor) have been exhausted. Most requests for changes are both constructive and appropriate.

RECOMMENDED READING

How to Write a Paper (3rd Edn)
Hall GM
BMJ Books, 2003
(ISBN 0727917285)

How to Read a Paper: The Basics of Evidence-based Medicine (2nd Edn).
Greenhalgh T
WileyBlackwell, 2000
(ISBN-10: 0727915789)

Statistics in Clinical Practice (2nd Edn)
Coggon D
BMJ Books, 2002
(ISBN 0727916092)

Epidemiology for the Uninitiated (5th Edn)
Coggon D, Barker D, Rose G
BMJ Books, 2002
(ISBN 0727916041)

Statistics at Square One (10th Edn)
Swinscow TDV, Campbell MJ
BMJ Books, 2002
(ISBN 0727915525)

Questionnaire Design, Interviewing and Attitude Measurement (2nd Ed)
Oppenheim AN
Pinter Publishers Ltd, 1992
(ISBN 1855670445)

The Complete Plain Words (3rd Edn)
Gowers E, Greenbaum S, Whitcut J
David R Godine, 2004
(ISBN 1567922031)

If planning a literature review (all web addresses current on 3/4/08):

<http://www.york.ac.uk/inst/crd/>

<http://www.sign.ac.uk/guidelines/fulltext/50/section6.html>

<http://www.biomed.lib.umn.edu/help/guides/EBM>

<http://www.ttl.fi/Internet/partner/Cochrane/>

<http://www.nhsplus.nhs.uk/web/public/Default.aspx?PageID=45>

JSIWEK J, GOURLAY ML, SLAWSON DC, SHAUGHNESSY AF. How to Write an Evidence-Based Clinical Review Article. *American Family Physician* 2002; 65:251-8.

SUMMARY OF ROLES AND RESPONSIBILITIES

The Faculty appointed assessors

Assessors are generally appointed at the stage of final submission (although they may also advise the Chief Examiner (Research Methods) at the outline stage). Their main task is to judge the suitability of the submission against the criteria in the Membership Regulations, and to advise the Faculty and the candidate on whether the required standard is met, or can be met with modification or further work. They will assist the candidate by listing any changes that need to be made, with reasons, and liaising with them during the revision stage.

The educational supervisor

The educational supervisor should encourage early identification of a research topic and submission of the outline proposal. Progress on this is likely to feature in the Annual Review of Competencies Progression (ARCP) or RITA review, and the Faculty recommends an outline proposal to have been submitted no later than the end of the 18th month of full-time training (or part-time equivalent).

The supervisor should ensure that any project is realistic and that there will be adequate resources to sustain the work until completion.

Progress with the dissertation should be monitored, via regular formal meetings. This will allow problems to be identified at an early stage and solutions identified. It may be helpful for the supervisor to alert the Chief Examiner (Research Methods) to problems that will affect the project significantly.

There is an expectation that the supervisor will advise the candidate on the quality of the final submission, although the final responsibility for the standard of the final submission rests with the candidate.

Educational supervisors who do not feel well versed to supervise their trainee's dissertation should discuss with the trainee how adequate support and supervision can be brought to bear (eg, they may wish the trainee to enrol with an academic centre or an independent academic supervisor).

The Faculty of Occupational Medicine

The process to be followed is detailed in the MFOM Regulations (April 2008). The Training Co-ordinator for Dissertations will be the first point of contact for candidates, supervisors and assessors. The Chief Examiner (Research Methods) or Academic Dean will advise on academic problems that arise once the proposal has been approved. The Director of Training will advise on training issues that might affect the submission of the dissertation.

The Faculty must be kept informed about progress. This will include agreement of the protocol and progress with other stages of the project. The latter will usually occur via the ARCP/RITA process. The Faculty must be informed about any problems that are expected to lead to a delay in receiving the final submission.

The Regional Postgraduate Institutes for Medicine and Dentistry

The Postgraduate Dean must be satisfied that specialist training in occupational medicine conforms to the nationally set criteria for the selection of trainees, the delivery of the training programme, the methods of assessment of progress and for determining satisfactory completion of specialist training. Specialist training is time limited and, in general, delays in achieving agreed milestones and outcomes will be interpreted as a failure to progress. Progress with the dissertation will be assessed at ARCP or RITA review.

The candidate

The production of a dissertation tests a range of skills, knowledge and attitudes such as self-motivation, organisation, communication, networking, study design and critical appraisal of information. All candidates must accept the responsibility to produce a dissertation of an acceptable standard in a timely fashion. Support from the educational supervisor and the Faculty will be available within the training programme and it is important for the trainee to make appropriate use of such support.



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