

RESEARCH SERIES

Research for higher degrees

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This last article in the research series outlines the three commonest higher degrees available to the medical practitioner.

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However, some institutions ask for a very detailed description of the research.

“The outcome of any serious research can only be to make two questions grow where only one grew before.” Thorstein Veblen

At the turn of the century this was perfectly true. Now research has to be justified, and the outcome must be far more concrete. Serious research should lead to a higher degree and publications in peer reviewed journals.

The aims of this article are to introduce the three commonest higher degrees open to the medical practitioner, to show some of their differences, and to give an impression of the many regulations that may be attached to them. These notes are in no way meant to be comprehensive. Anyone thinking of doing a higher degree is strongly advised to consult the regulations of their parent university, or the university, where they are working.

TYPES OF DEGREE

The medical graduate wishing to undertake research for a higher degree has three main choices: a Master of Science degree (MSc, or MPhil), a Doctorate in Medicine (MD, or DM), or its surgical equivalent (MCh), or a Doctorate in Philosophy (PhD or DPhil).

There is a hierarchy from MSc, to MD, to PhD, in the amount of research that has to be presented, and the time needed to complete the degree. For practical purposes an MSc takes one year to complete, an MD two years, and a PhD three years. There is also some controversy about the relative scientific merits of doing a PhD or an MD. For a career outside medicine a PhD will be an advantage: it is recognised as the foundation in scientific training. In terms of a clinical career it has been argued that an MD, which is often based on clinical research, is of more value.

REGULATIONS

Each university will have its own regulations regarding the different degrees and their presentation. These may be very different. The comments in this article in no way attempt to be comprehensive, but aim to give some flavour for what is required for each degree.

Whatever the degree, if a thesis is required, then the research proposal, or title must be approved by the university before registration can be completed. This may only require the presentation of an abstract of the proposal.

MSc

Regulations for this degree are probably the most variable. An MSc may be a full time, or part time taught course, in which the student completes various modules to obtain the required number of credits. Alternatively, it can be a research based course. In some universities a student may initially register for an MSc and at the end of the first year submit a transfer report. This is examined as an MSc, although no degree is awarded. If it is accepted then the student can continue working towards a PhD thesis.

Whether the MSc is taught or research based the fee paid to the university will generally be the same: around £3000 for a one year full time course. The same fee may be divided into two if the degree is taken as a part time course over two years.

MD

“The degree of Doctor of Medicine is awarded by the University in recognition of a thesis on some subject within the scope of the Faculty of Medicine on a medically orientated topic, which shall embody the results of original research (including unbiased personal observation) which is adjudged to constitute an addition to knowledge.”¹ Oxford University defines it slightly differently: stipulating that the candidate should have “written a dissertation on some subject connected with the Science or *Art* of Medicine” (my italics).²

In contrast with the degrees of MSc and PhD, MDs can only be awarded to medical graduates. There may, in addition, be an obligation to show “continued professional development in medicine or medical science, beyond that demonstrated by the BM, ChB. In this respect, the MD differs from the PhD in requiring evidence of sufficient and continuing professional attainment.”¹ However, such an explicit distinction is not made in all universities.

This professional standing may be judged by the submission of a curriculum vitae to the university’s committee on MD and MCh theses at the time of application for registration.

The requirement to demonstrate “continued professional development” is variable. For the University of Manchester this means that the applicant will have practised medicine, or a medical science for at least four years after graduation. Registration must be at least two years before submission. However, the time limit between the completion of the registration period and the submission of the thesis varies between universities from four to eight years.

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Applicants for the degree of doctor of medicine will usually be graduates from the university to which the application is made. If not, then they may either have to hold an “appropriate post” within the university, its teaching hospitals, or fulfil the requirements of a full time registered student.

In many universities there is an obligatory oral examination. This is no formality. It will centre on the work of the candidate, the results, and their significance. In addition the examiners may wish “to test the candidate’s knowledge in any area...germane to the candidate’s field of study”.¹

Some universities will, in exceptional cases, award the degree “with distinction”, or with a gold medal to mark the fact that the work presented is beyond that normally expected for an MD

Universities may charge a one off registration fee, or an annual fee over the two years usually taken to complete the degree. These fees are generally very much less than those for MScs or PhDs (£300–£500). This reflects the fact that many MDs are based on clinical work and so do not “cost” the university anything. The fee just covers administration costs and the expenses of the examiners.

PhD

Regulations for a PhD may be very detailed and very strict. The general regulations alone take up 13 pages in the Examination Decrees and Regulations of Oxford University. These refer to the, “Status of Student for the Degree of Doctor of Philosophy”, admission and confirmation of that status, supervision, the residence requirement, and the examination of the student. A further 55 pages cover regulations of the individual faculty boards.²

DPhil students at Oxford must be resident for at least part of their time as students. This may not be the case for PhD students at other universities.

As with the MD, approval for a particular line of study must be sought from the university before the candidate can be registered. This is to ensure that the research has merit and a reasonable chance of success.

An oral examination is the usual examination format. Some universities will permit a written, or a written and an oral examination instead. The regulations for the examination may vary, and may differ from those for an MD. For example, “Examiners shall bear in mind that their judgement of the substantial significance of the work should take into account what may reasonably be expected of a capable and diligent student after three or at most four years of full-time study ...”² Again, this recognises the difference between DPhil and DM candidates.

There may be a limit for the time taken to submit: 12 terms for a full time student, 24 terms for a part time student.² Other universities are not so strict.

Fees for a PhD are generally the same as those for an MSc: about £3000 a year. There may also be college fees for certain universities. These may add as much as £1700 a year to the total cost of taking the degree.

University fees for overseas students are another matter entirely: they are very much higher than for UK students.

General

The University of Manchester has a common document, “Regulations for the presentation of theses and dissertations”,³ which applies to all degrees. This document gives very precise instructions about the minutiae of the thesis (see box). This document should not be taken lightly: the registrars will not accept a thesis without the appropriate preliminary pages, or one that breaches any of the other requirements.

There will be detailed timetables of deadlines for handing in the official “Notice of Submission”, and then the

Some of the things that will need to be correct before submission

- Paper size
- Size of margins
- Page numbering
- Spacing
- Font size
- Number of words permitted in the main text
- Organisation of bibliographic citations and references
- Use of preliminary pages
- Copyright declarations
- Types of bindings permitted
- Lettering on the spine

submission itself. The submission dates for PhDs, MDs, and MScs may be different. Missing a deadline may incur a financial penalty or lead to a lengthy delay until the next submission date.

RESEARCH COMPONENT REQUIRED

The amount of research required for higher degrees is changing. This is partly to ensure that students do not end up spending three years trying to do something, which fails, and then leaves them with nothing at the end of it.

Many MSc courses are taught in modules and have a formal examination at the end of the course. They will usually include a dissertation, which may be research based. However, some MScs are still research based and a full thesis has to be presented for examination.

Although an MD is awarded in recognition of original research, this will not necessarily be full time research. The University of Manchester expects that, “The majority of candidates for the M.D. will be registered with the presumption that they will study on a part-time basis, and will continue to develop their professional standing in an appropriate post.” This presumption is not made on the other side of the Pennines in Sheffield.

Original research may not be all that is required. One of the conditions applied by Oxford University is that, “The said dissertation is based on some knowledge of the history of the subject of which it treats and embodies original observations on either clinical or experimental material.”² This requirement is implicit in a thesis, and marks it out from a pure research paper. It encourages the candidate to do some historical detective work and gain a better appreciation of the topic. This in turn may uncover interesting observations and painful truths.

Some universities will accept work that has already been published, “Provided that such material is linked by extended narrative statements and discussion showing how the individual publications form part of a logical series of investigations and relate to the totality of the work presented in the thesis. The examiners may accept work done in conjunction with others, provided evidence is furnished as to the contribution of the candidate.”⁴

Traditionally a PhD was obtained after doing three years of full time research, writing a thesis, and then successfully defending it in a viva voce examination. Now there is an increasing emphasis on completing taught modules, in addition to the research. These modules might include biostatistics, epidemiology, philosophy of science, or any basic science relevant to the research being undertaken. In addition to presenting a thesis, the student would be

expected to present a detailed portfolio of the courses attended, and the work done on these courses.

SETTING UP

Overall, going from a vague idea to a working, funded, project is probably the most difficult part of the whole process. However, for a taught MSc this may be comparatively simple. All that is necessary is to find the time (perhaps before taking up an SpR post, or as the optional year of research as an SpR, or part time), and the money to pay the fees.

For an MD or PhD things are much more difficult. Initially, you will need to find a supervisor who can help you to shape your good idea into a workable study. Once you have planned the study, funding will be the main hurdle. Some clinical departments have large research funds that may pay a basic salary for two or three years. These opportunities are rare. The alternative is to apply for a research fellowship either from the Medical Research Council, Wellcome Trust, or one of the medical charities, or from the Royal Colleges. These can be very competitive and will only pay a basic salary. Any laboratory costs may require funding from elsewhere.

When applying for grants find out whether the grant can be used to pay the university fees. This is particularly important for a three year PhD, which may attract fees in excess of £10 000 over the three year period.

Clinical studies will have to be approved by one or more ethics committees, depending on the number of hospitals from which you aim to recruit patients. This may take some time to obtain if the committee only meets infrequently. Ethical approval is usually necessary before a grant application can be made, therefore check before applying.

Any study using live animals will have to be licensed by the Home Office. This means that you need a personal licence to perform the experiments, and that the experiments have to come under a project licence. To obtain a personal licence you will have to attend a course on animal experimentation, which has been approved by the Home Office (most universities run them regularly), and pass the examination at the end. Then you will have to make a specific application for a licence. A separate project licence will be needed. The review process may take several months, especially if amendments have to be made.

Setting up any research project is a challenge. If the aim is to work on it full time and obtain a higher degree, the challenge is that much greater. It is essential to start the process as early as possible and do as much as you can before leaving a clinical post.

TIPS

“Don’t do as I did, do as I say.”

Looking back on my time in full time research I wouldn’t change very much, not because I did everything right, but because I learned so much from it. However, there are a few things I would advise against re-learning.

Read all the regulations before you start and register with your parent university, or the university where the research will be conducted (if appropriate), as early as possible. That way there will be no enforced delay between writing up and

submitting. The latter arises because some regulations state that submission cannot be, “earlier than x months after registration for the degree”.

Writing up always takes longer than you ever thought. Start to write up the methods section immediately. That way no steps will be omitted. It will also provide a useful reference if any changes are made during the course of the study. Parts of the introduction and the discussion can be written up as the work progresses. This means that if there is a hiatus in data gathering some useful work is being done. The texts written at this time may need considerable revision later but at least they will provide a backbone to the final version. It is far less daunting to revise and edit a piece of text than to look at a blank sheet of paper.

Remember it is not just the writing that takes time. There is the final editing to put the whole text together, as well as the references to format and organise. From the outset it is essential to use some sort of “reference manager” software to catalogue all that you have read, and then allow ready access to the references and automatic formatting.

Don’t forget the tables of contents, and tables of figures. Most word processing packages can do all this automatically, as long as all the headings and figure titles have been formatted appropriately. However, this can be a problem if you hadn’t thought about it until the day before printing out the final version. It is therefore essential to think about the layout for the final thesis early so that all the titles and subtitles are consistent.

SUPERVISION

Supervision for higher degrees is undergoing a period of change. Traditionally each candidate had one supervisor, who might or might not take a very active role in supervising the research. An absentee supervisor was then a considerable handicap if the experiments did not go according to plan.

To overcome these problems most institutions now appoint an “adviser” for MDs (in addition to the supervisor) from within the university. This person may, “give guidance on the planning and development of the research and the preparation of the thesis.”⁴ The faculty of medicine may even, “ensure that appropriate supervisory arrangements are provided”,¹ without specifying how this might be achieved.

Supervision may be tightly regulated. The regulations for the Oxford DPhil state that, “The supervisor shall submit a report on the progress of the student to the board three times a year as required, and at any other time when the board so requests...”²

There may be a requirement for regular formal meetings between the student, the supervisor, and the appointed advisor. Records of these meetings can then be presented to the examiners when the thesis has been completed. These records would be particularly valuable if the student failed to complete the work for reasons which were clearly beyond his, or her, control.

The regulations may also cover some of the responsibilities of the student. “It shall be the duty of every Student for the Degree of Doctor of Philosophy to undertake such guided work as his or her supervisor requests; to attend such meetings with his or her supervisor as the latter reasonably arranges...”² This recognises that the DPhil student may be much younger than the candidate for a DM, and so may require much closer supervision.

FINALLY

“Research! A mere excuse for idleness; it has never achieved, and will never achieve any results of the slightest value.”

Key point

- Research time is too precious to use for setting up the project: use it for collecting data, doing experiments, and writing up.

Don't be put off by Benjamin Jowett's disparaging remark, or all the complicated regulations, and the difficulties of setting everything up. With a good supervisor all these things can be tackled in turn and a path can be steered through the maze. Research for a higher degree is extremely rewarding, and can be great fun. Whatever happens you will gain a great deal from it: you will be better informed, and much the wiser. If you get the chance, take it.

Further reading

Murrell G, Huang C, Ellis H. *Research in medicine. A guide to writing a thesis in the medical sciences*. Cambridge: Cambridge University Press, 1990.

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- 1 **University of Manchester**. *Degree of MD: notes of guidance and regulations*. Manchester: University of Manchester, Faculty of Medicine, Dentistry, and Nursing.
- 2 **University of Oxford**. *Examination degrees and regulations*. Oxford: Oxford University Press, 1998.
- 3 **University of Manchester**. *Regulations for the presentation of theses and dissertations*. Manchester: University of Manchester.
- 4 **University of Sheffield**. *Regulations for the degree of doctor of medicine (MD)*. Sheffield: University of Sheffield, Faculty of Medicine.