SAJS

Forum

Finding a topic for an MMed research report

Sometimes the most difficult aspect of research is finding a place to start. There are various techniques for generating focused research questions and logical ways to find 'gaps' in the literature. Advice on how to make a project feasible within the time and resources available, is also useful. Certainly, research cannot start if there is no clear research topic, hypothesis or question. Even these words may be confusing; a **topic** is a broad area of research such as 'Ulcers', or perhaps 'Duodenal ulcers'. A **hypothesis** is simply a proposition regarding the outcome of a study, e.g. 'Lifestyle factors influence the severity of duodenal ulcers'. Research is much easier to plan if there is a clear, concise **research question** that ends in a question mark and conceptually has an answer, e.g. 'What lifestyle factors increase the risk of duodenal ulcers?' Once one has a question, the research can be focused to answer that question, and it becomes relatively easy to structure the protocol accordingly.

Ideally, you find your research topic by being curious during your daily clinical duties. Listen when experienced and senior clinicians discuss specific problems on ward rounds or at meetings, especially if you hear 'I wonder if there is any relationship between x and y?' – particularly if said by someone whom you thought knew everything, such as a senior consultant! Check if there is an answer. Or you may hit upon a research question after seeing a few patients with the same unusual disease. HIV is creating new diseases in many fields. Make a conscious effort to be observant and look for potential projects in your clinical environment every day.

Another ideal option is to be placed in a unit with active clinical researchers. They will be researching topics that interest them and are likely to have several research questions that you could tackle. Clinicians who don't do research are often amazed at how researchers seem to have a never-ending supply of potential topics. A further avenue is to consult members of research entities at your institution, who will be listed with their field of interest on the university website. Look up what they do, and search their names on PubMed to see their area of interest. Look at the basic sciences, which very often have ideas for clinical projects but, owing to lack of access to patients, are unable to pursue them effectively. Establish contacts and see them.

If neither of these options yields a good topic, or there is a specific area that you wish to pursue, then work on clarifying your topic. You may only need one, or you may use a few different strategies at different points in the process. The strategies suggested below are not meant to be used sequentially – if one works for you, pursue it directly. When trying to find a topic, plan on developing 3 to 4 research questions, as some may become non-viable as you get closer to finalising the question.

1. Eliminate the topics in which you have no interest. Sometimes, starting very broadly and gradually dividing the topics into logical subsections yields useful insight (Table I). When using this approach, be bold and go with first impressions; it can always be repeated if the first run through doesn't work. While the diagram starts with anatomical divisions, this is not essential – one can begin with surgical procedures or other general starting points.

2. Use a clinical research topic generator. Try looking into all possible research directions surrounding a particular medical disorder of interest, as indicated in Fig. 1. While the possible directions given are not exhaustive, they can be extremely useful to begin generating research ideas. You may need to combine two or more of these directions to provide an even clearer and more focused research question, particularly if much has been published on the original question. Thus, using the diagram and starting with a central topic of amputation of the lower leg, various questions can be generated as indicated by the arrows.

Direction 1: What is the level of care for patients who have had lower limb amputations in hospital?

Direction 2: How does the presence of HIV infection change the pain occurring after lower limb amputation (brings HIV and the basic science of pain measurement into the project)?

TABLE I. ELIMINATION PLAN FOR SURGICAL RESEARCH TOPICS. SHADED AREAS INDICATE OPTIONS THAT HAVE BEEN EXCLUDED AT EACH PHASE. NOT ALL SUBDIVISIONS HAVE BEEN INCLUDED AT EACH STAGE.

Anatomical divisions				
Cardiovascular	Upper GIT	Small intestine	Carcinoma	Appendix
Gastrointestinal →	Lower GIT		Inflammation	Crohn's disease
Endocrine	Associated organs	Large intestine	Infection	Ulcerative colitis
Limbs			Metabolic	Etc
Respiratory			Etc	
Genitourinary				
Neurological				
Etc				

TOPIC

Direction 3: What are the most common causes of amputation of the lower leg in our hospital (uses two concepts – cause and local experience)?

Direction 4: How many below-knee amputations do we perform (audit) and what subsequent treatment do they require (treatment)?

Direction 5: What diagnostic test best predicts those patients who will need lower limb amputations?

3. Create a mind map. Once there is some clarity on the direction of the research, you may feel that the topic is still too vague. Take paper and pen and draw a mind map (Fig. 2). Alternatively, you can use a computer programme to design a mind map – several are available. Start with your topic heading in a central box, then add all directly linked possible variables related to that topic leading off from the box. Then subdivide these first-order variables into second-order variables. Continue for 15 minutes,subdividing each variable until you run out of ideas. Then select and connect concepts to ask a research question. Remember always to include the topic from the central box in the research question.

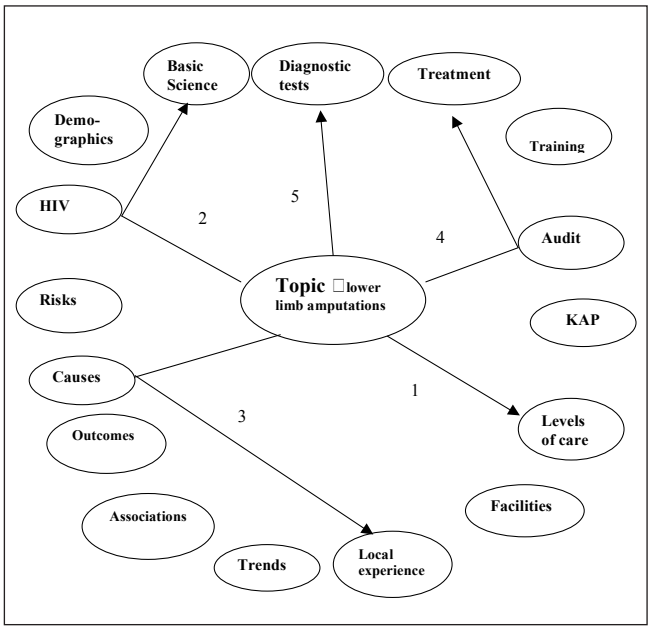

Fig. 1. Clinical research topic generator. Arrows indicate connections between options and refinement of research topic located in the centre of the diagram.

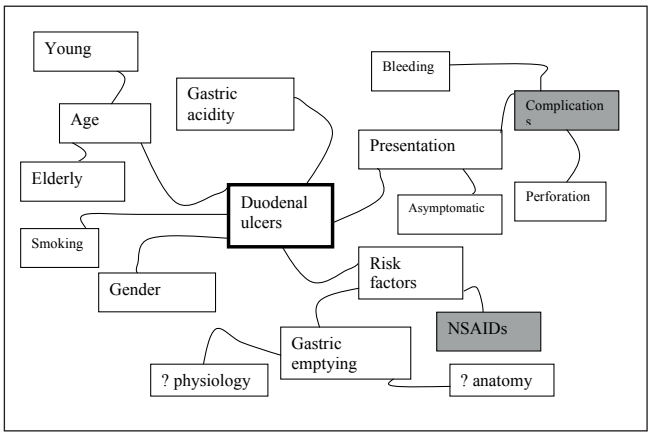

Fig. 2. Mind map to investigate possible topics in duodenal ulcers. ? indicates areas that need further reading, after which additional boxes may be added.

Thus, by following the shaded items, the project becomes 'What is the NSAID intake in patients who present with complicated presentations of duodenal ulcers?' By selecting from the blocks with dots, you create a different project: 'What is the age and gender distribution of our patients with duodenal ulcers?'

4. Add comparative elements to a topic. If you have found a potential topic and clinical direction but a good question is eluding you, try adding a comparative element to the topic. There are quite a few obvious comparisons that can be added (Table II), and there may be other comparisons more specific and useful to your particular field. Thus, in the research topic of incisional hernia repair, potential comparators could include: gender differences, results from one hospital v. another, or comparing your results (in South Africa) with those obtained in the USA or Europe. In the latter case, you must be careful to collect identical data to the other study, but the results may provide extremely useful information.

5. Read other research. Whichever route one takes in seeking a research question, at some point the literature will have to be searched. Many students despair when told by a potential supervisor to go and read the literature to find a topic. This task may often appear overwhelming – but there are some simple strategies that can limit the number of articles found. As part of the discussion section in a research paper, future projects emerging from the current research are listed. Many of those projects have not been done. Some students who've written a paper as part of their PhD will never do research on that topic again but will still list potential future projects. Check if they have been done by using the key words in the paper plus one from the future projects as search terms.

Reading a paper describing data found in another country raises more questions regarding the validity of the data used in South Africa, because of differences in population groups, access to health care, or different social factors. Use the key words of the paper, add 'South Africa' to the search terms, and see if the project has been done here. Alternatively, if you would like to repeat the study yet make it different, use the clinical topic generator or comparator table to extend the data into a new research topic.

When searching in PubMed or an alternative, enter as many variables as possible to refine your search. There are a number of possibilities that can come out of that search:

- no-one has ever thought about that combination of topics before – go ahead with the project.

TABLE II. USEFUL GENERIC COMPARATORS TO EXPAND A RESEARCH QUESTION

Comparison	Example
Gender	**Male : female**
Age	**Young : elderly**
Location	**Rural : urban**
	Two hospitals, provinces/countries
Co-morbidity	**HIV+ : HIV-**
	Diabetes + : diabetes-
Disease state	**Acute : chronic**
Severity	**Mild: moderate: severe**

- a similar topic has been published but in a different population group/gender/age group; again, go ahead with the topic. For example, the project might have been conducted on young adults in India but not elderly people in South Africa – a new project.
- exactly the same project has been done, among the same group of people. Either find another comparator/item from the clinical generator to add, or find a new topic.
- there are thousands of articles written on the topic! Subdivide even further to make the topic more focused. For example, searching with the terms 'breast cancer surgery' yields 60 961 results. By adding 'South Africa' to the search terms, the number of results drops to 100 – a much more useful number (search run on 25 August 2010).

Once some good possible research questions have been generated, and no matter how excited you may be by a particular topic, it has to be possible to complete. Go through the checklist below to ascertain if the project can be completed, in the time available, on a daily basis and in terms of the time remaining to complete your degree.

- The best designs for an MMed project are those that are **quick to do** – such as descriptive studies, retrospective audits, small cross-sectional studies and case-control studies using clinical data that have already been collected i.e. a retrospective survey. Randomised trials and cohort studies are too long and complex for the MMed report.
- The subjects or data must be easy to **access**. There is no point in getting excited about a topic requiring elderly people in a rural community if you are in Johannesburg. When doing a retrospective study using previously collected data, make sure there is unlimited access to that data. Be honest when using a great volume of data from other sources such as the NHLS or a private hospital; you need to ask permission but you could gain an experienced supervisor in the process who will add to the quality of your project.
- Limit the time spent **data gathering**. Don't start a project that requires 12 months of data gathering if you only have 6 months left before finishing time.
- Unless your supervisor or department has substantial research funds to give you for your project, **make the project cheap**. The cheapest and fastest project will involve looking back through clinical records (a retrospective study). If you require funds, consider approaching your faculty research office for assistance in applying to various funding agencies, both within the university and without, but be aware that external funding agencies can take up to 18 months to remit.
- Be careful with research projects that cover areas with potential ethical problems. Such topics include those using children, reproductive rights or vulnerable groups of people. While the research questions may be fascinating, the **ethical issues** may complicate the study enormously and make it difficult (or impossible) to complete. You may spend 6 months trying to get the project through the ethics committee – yet, once through, it may be too complex to complete.
- If planning a prospective study, make sure that **you collect all the data**. Don't depend on other professionals to have the same desire to pay the attention to detail in collecting your data that the project may require.

Conclusion

However you do it, producing a good, focused research question takes some time and reading through the literature. You can often draw a mind map with the knowledge that you have and, once a narrower direction has been chosen, use the clinical generator and then search the literature. After reading more widely, you may need to revisit the mind map or use the comparator table to clarify the question a little. Research questions can be developed from broad clinical topics using a variety of creative methods. While refining the question, it is important to ensure that the project is feasible, with the resources available. Proper planning of the question will ensure a good protocol and a useful and successful research project.

A. Bentley
Wits Dial.a.Bed Sleep Laboratory
Brain Function Research Group, School of Physiology, Faculty of Health Sciences, University of the Witwatersrand
Johannesburg

E. Buchmann
Department of Obstetrics and Gynaecology
School of Clinical Medicine, Faculty of Health Sciences
University of the Witwatersrand