Research and the paramedic
Pauline Griffiths and Gail P. Mooney

Learning outcomes for the chapter
By the end of this chapter the reader should be able to:
1. Discuss the relevance of research to the practice and education of paramedics
2. Describe why paramedical practice can be classified as a professional occupation
3. Consider the development of paramedic education
4. Outline the basic stages of the research process

Keywords
changing role of the paramedic
paramedic education
profession

Introduction
The paramedic profession is at an exciting stage in its development. The origins of the profession lie in learning by rote and protocol controlled practice dictated by other professional groups. Ahead for the profession, if the challenge is taken, lies autonomous professional paramedic practice. To function at this level of responsibility and accountability paramedics need to be able to draw on research that has been evaluated critically to inform their evidence based practice. The College of Paramedics (CoP) (2008: 23) Curriculum Guidance and Competence Framework specifies that: ‘The paramedic will be able to understand research methodology and clinical audit and be reading relevant research and discussing with colleagues the outcomes and conclusions’. Clinical judgements should be undertaken considering the research evidence base and the application of relevant research findings that complement the experiential (by doing) learning that clinical exposure has provided.

Following the guidance of the CoP student paramedics and paramedics undertaking higher education programmes will find that all curricula contain research
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<th>Academic level 5</th>
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<td>Dip HE, Foundation degree</td>
<td>BSc Honours degree, graduate certificate or diploma</td>
<td>Master's degree, post-graduate certificate or diploma</td>
<td>Doctorate</td>
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<td>May evaluate equipment, techniques and procedures</td>
<td>May also carry out research and development (R&amp;D) as a major activity.</td>
<td>As specialist role but may in addition initiate and develop R&amp;D programmes.</td>
<td>As advanced practice role but may in addition coordinate and implement R&amp;D programmes and/or initiate and develop programmes with external impact</td>
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<td>May undertake straightforward or complex audit or assist with clinical trials or research projects</td>
<td>May regularly undertake clinical trials or research projects</td>
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**Figure 1.1** Paramedic career frameworks: research and development (adapted from College of Paramedics 2008: 20)

appreciation and the student’s ability to critique research papers will be assessed. Furthermore, within essays and other assignments it will be necessary to demonstrate understanding of the research process and utilise informed discussion of published research papers. This emphasis on research for the educational preparation of the paramedic is so they can ‘use research evidence to design, improve and implement effective paramedic practice’ (CoP 2008: 53) and thus to, importantly, improve patient outcomes. Paramedics and paramedic students must develop an enduring curiosity for knowledge and a commitment to the appraisal and development of paramedic practice. This requires individual review of practice and, increasingly, consideration and critique of what is accepted practice. The Paramedic Career Framework (CoP 2008) notes that involvement with research and development is a core element of paramedics’ professional development towards a future where consultant paramedics lead the profession’s evolution (see Figure 1.1).

**About this book**

This book seeks to give the paramedic student, and the registered paramedic who is new to research, an introductory overview of key elements of research, providing sufficient information and guidance to further reading so that the paramedic is enabled to engage with research to inform and develop clinical practice. For paramedics undertaking programmes at Master’s level that require a research to be undertaken, this book will give basic skills in developing and conducting a research study that will then be complemented with more specific methodological reading. It may be that the book will simply aid the inquiring paramedic, who is seeking to research an aspect of their own practice, a clear overview of how to go about it.
Research and the paramedic

What is research?

When we use the term research we usually consider the systematic processes used to investigate something that we know little or even nothing about. Usually the knowledge generated will then contribute to an existing body of knowledge related to that particular topic. During the course of this book you will be introduced to different ways of collecting data (methods) and the philosophical underpinnings of these methods (methodology). We consider someone actively involved in carrying out research as being ‘research active’; however, all paramedics must be ‘research minded’. To be research minded is to be seeking consciously to ask questions of practice that can be answered by research. This can be through seeking out research conducted by others either by reviewing published papers or consulting systematic reviews of research studies often presented in guidelines such as those produced by the National Institute for Health and Clinical Excellence (NICE) or the Joint Royal Colleges Ambulance Liaison Committee (JRCALC).

What is a profession?

The paramedic profession became a registered occupation in 2000 when paramedics were required to register with the Council of Professions Supplementary to Medicine, an organisation that became the Health Professions Council (HPC) (Donaghy 2008). To move to full professional status certain criteria must be satisfied. Flexner’s classic 1915 essay ‘Is social work a profession’ (Flexner 1915/2001) stated six criteria for a profession:

1. Professional activity is based on intellectual action along with personal responsibility.
2. The practice of a profession is based on knowledge, not routine activities.
3. There is practical application rather than just theorising.
4. There are techniques that can be taught.
5. A profession is organised internally.
6. A profession is motivated by altruism, with members working in some sense for the good of society.

If you were to check Flexner’s criteria and then estimate how many of them are achieved by the paramedic profession currently, what would you answer? Within this chapter we will consider the second criterion: the practice of a profession is based on knowledge, not routine activities.

Development of the paramedic role

The use of litters or horse-drawn carts to carry the ill or the dead was developed during the Bonaparte Wars in 1793 to provide transport and treatment for the wounded. This mode of transport was also used in the United Kingdom in the nineteenth century by the police to transport patients in hand-litters and municipal
Pauline Griffiths and Gail P. Mooney

asylums had horse-drawn fever ambulances. Motor vehicles classified as ambulances were used during the two World Wars (Claggs and Blaber 2008).

By the 1960s the ambulance driver’s role was to transfer patients between home and hospital. Minimal training was received and requirements for the role were to be able to drive, to be strong and, predominantly, to be a man. Over time it was realised that basic emergency care could be provided by ambulance services and ambulance drivers received rudimentary first aid training, but it still remained a low status and semi-skilled job. The Millar Report (Ministry of Health 1966) recommended that ambulance training should be delivered in a more consistent manner and required that a minimal level of equipment be provided on ambulances. Despite this development, preparation for ambulance personnel remained short and relied on a training delivery rather than an educational approach (CoP 2008). This training focussed on rote delivery, where learning is by routine or repetition, often without full comprehension of the topic and with limited ability to transfer or to question learning. This degree of inflexibility resulted in limited ability to respond to new demands facing the service (Brady and Haddow (in press)). From the 1970s, changes in emergency care provision especially improvements in advanced life support, including defibrillation and resuscitation of severe trauma, gave ambulance personnel an increasingly enhanced role resulting in the registered title of paramedic in 2000. The learning approach remained, however, that of training rather than of education.

The Institute of Health and Care Delivery (IHCD) ambulance technician training developed from the Millar certified course to prepare ambulance technicians and paramedics was the method of paramedic preparation prior to the entry of paramedic education into higher education. These courses were short and involved much learning ‘on the job’ whilst employed as a technician or a paramedic trainee. The management of immediately life-threatening medical conditions and trauma management were the major educational content of these programmes (Brady and Haddow (in press)). It had become clear however that the ‘blue light’ high drama aspect of the paramedic work experience had led the content of ambulance training whereas the majority of calls are not in fact life threatening (CoP 2008). In Taking Healthcare to the Patient: Transforming NHS Ambulance Services (DH 2005), (known as the Bradley report), it was suggested that the paramedic should provide a wider range of emergency and unscheduled care and should offer interventions to assist patients to remain at home and so not require admission to hospital. Furthermore, paramedics should be prepared educationally for their role within a higher education setting using curricula guided by the CoP and developed and delivered in partnerships with paramedic NHS Trusts. This new curriculum would prepare the paramedic for developing roles and enhance adaptability. In High Quality Care for All (Darzi 2008) a vision of appropriate care being delivered where needed was offered:

Partnership working between the NHS, local authorities and social care partners will help to improve people’s health and wellbeing, by organising services around patients, and not people around services. (Darzi 2008: 43)

The paramedic profession is responding to the educational and the political challenges to provide care centred on patient needs rather than the needs of
Research and the paramedic

the organisation. The roles and responsibilities of ambulance and paramedic practitioners have therefore broadened in response to developments in medical care, societal change and political initiatives. The need for paramedics to be able to respond effectively to this reality required a new approach to their educational development in that learning must be a lifelong process and that on-going professional and personal continuous development was essential. The Quality Assurance Agency (QAA) benchmarks statements for paramedic practice note that:

*The development of the reflective practitioner with a commitment to continuing professional development is fostered by developing a research ethic to contribute to the research portfolio in order to enhance the scientific base of the profession, improve patient care and optimise professional autonomy.* (QAA 2004: 7)

Professional autonomy carries a high expectation of professional accountability. This requires that the professional be held responsible for any acts or omissions that may cause the patient harm if that harm was due to the paramedic lacking knowledge or skills that it would be reasonable to expect them to have.

Knowledge to inform paramedic practice

Paramedic training and practice has been guided by the Joint Royal Colleges Ambulance Liaison Committee (JRCALC) since 1989. JRCALC UK Ambulance Service Clinical Practice guidelines are developed, or updated, on a five-year cycle based on systematic reviews of the evidence and consensus agreement to provide ambulance services with clear robust clinical guidance. These guidelines are drawn up by a committee that comprises paramedic and other professional bodies, in particular the medical Royal Colleges, with a three-yearly meeting hosted by the Royal College of Anaesthetists in London (JRCALC 2011). Increasingly paramedics are taking greater ownership of the knowledge base of their profession but this knowledge remains medically dependent currently. The challenge for the paramedic profession is to develop its own body of knowledge whilst drawing on other professional knowledge as appropriate.

Future knowledge

The paramedic practising in the twenty-first century has knowledge and skills that are quite unrecognisable from the transporting function of the early ambulance driver. The paramedic is required to exercise professional autonomy and deliver high level interventions in difficult circumstances. The UK-wide modernisation agenda (DH 2005) notes that a common educational framework should be delivered within higher education with its curriculum guided by the College of Paramedics/British Paramedic Association (2008) and the QAA (2004). The evolving role of the paramedic is reflected in the key changes to the CoP curriculum for paramedic registrant (CoP 2008) that notes that the paramedic should be skilled in:

- making appropriate referrals
- providing increased patient assessment
undertaking enhanced history taking
enhancing clinical decision making
appreciating research and understanding research methodology.

These abilities cannot be learnt by rote but rather by having a critical understanding of the knowledge base of the paramedic profession, including learning from and in practice and using skills of reflection to aid this process of continuous learning (Rolfe et al. 2010).

Clinical decision making

Clinical decision making is a useful catch-all term to explain the practice of the health professional. When confronted with a patient the clinician has to:

- assess the situation
- develop a working hypothesis or idea of just what the issue/problem is
- collect more information to confirm or disprove the initial impression
- put in place interventions
- evaluate the effectiveness of the interventions
- reassess if required.

This problem solving approach is used by all health professionals (Higgs et al. 2008) including paramedics. The paramedic draws on past knowledge (theoretical and experiential) and the expert paramedic can often surprise the student paramedic by making what seems instant decisions even before all the assessment has been completed. To act as an autonomous professional clinical decision maker the paramedic must include best and current knowledge to inform their decisions: their practice must be evidence based.

Paramedic research

Paramedics have engaged in higher education since the 1990s as part of their post-qualifying continuous personal and professional development, undertaking Honours and Master's degrees and PhDs. However, the body of paramedic research conducted and led by paramedics in the UK remains limited. One notable example of a paramedic who has been involved in large numbers of funded research projects is one of the chapter authors of this book, Malcolm Woollard. See Box 1.1. You will note that this fairly recent study of paramedic practitioners has only one paramedic listed as an author. A key challenge to the evolving and inspirational paramedic research profile is to have more paramedics as leaders of such research projects.
Research and the paramedic

Box 1.1 An example of a paramedic involved in research study into paramedic practice

Effectiveness of paramedic practitioners in attending 999 calls from elderly people in the community: cluster randomised controlled trial (Mason et al. 2007)

Authors:
Suzanne Mason, reader in emergency medicine
Emma Knowles, research fellow
Brigitte Colwell, research associate
Simon Dixon, senior lecturer
Jim Wardrope, consultant in emergency medicine
Robert Gorringe, lead emergency care practitioner
Helen Snooks, professor of health services research
Julie Perrin, nurse consultant in emergency medicine and Jon Nicholl, professor
One paramedic involved, Robert Gorringe, lead emergency care practitioner.

The profession’s regulator, the Health Professions Council (HPC), (2007:9) requires that the registering paramedic should:

- recognise the value of research to the critical evaluation of practice
- be able to engage in evidence based practice, evaluate practice
- be aware of a range of research methodologies
- be able to demonstrate a logical and systematic approach to problem solving
- be able to evaluate research and other evidence to inform their own practice systematically and participate in audit procedures.

This level of research expertise remains that of a ‘user’ rather than that of a ‘doer’ of research; however, as we noted earlier, the Career Framework envisaged by the CoP sees paramedics engaging with and leading research. The readers of this book will probably be the generation of paramedic researchers that take control over their own profession, and the generation of that profession specific knowledge. Jones and Jones (2009) suggest that with increasing numbers of paramedics undertaking research proposals or small-scale research projects for their degrees this will lead to more paramedics publishing their work and so enhance the professional standing of the profession. This is to be commended.

Jones and Jones (2009) further highlight the conundrum facing those who seek to develop research undertaken by paramedics to inform paramedic practice in that, due to paramedic science being a relatively new discipline in higher education, those who often teach research to paramedics are not paramedics. Jones and Jones (2009: 467) suggest that: ‘This perhaps limits their ability to provide adequate example or application of major research concepts to a practice situation which could be understood by the pre-hospital specialist’.
This concern can be countered by noting that higher education lecturers often lecture to many professional health groups. Good teaching practice requires that profession-specific research examples are utilised and that the students are guided to discover the relevance to their practice. Jones and Jones’s comments are, however, pertinent and it is to be hoped that as paramedic research and education develops there will be an increasing number of paramedics who will be teaching research in higher education settings and who will also become leaders of research studies.

The research process: an overview

The research process is a framework to help the researcher plan research in a logical manner. Whereas it is often seen as a linear process, it certainly is not, often requiring the researcher to revisit certain aspects of the process. Below is an overview of the research process.

- **The aim or problem** – all researchers need to start off with an aim or problem which they wish to investigate and find an answer to. A paramedic for instance may notice a practice that seems illogical and wonder if it could be done better.

- **Ethical approval** – all researchers must consider the ethical issues that the study causes; in many cases ethical approval will need to be sought and gained from local ethics committees before the study can be carried out.

- **The literature review** – this is an important part of the research process. The researcher needs to review the literature to ascertain what research has already been carried out. It may be that the researcher could replicate a study, building on existing research findings. The literature may point the researcher in another direction or it may identify ‘gaps’ in the literature – areas where research has not yet been carried out. In some cases it may highlight that there is no need to carry out the proposed research. From critically reviewing the literature the researcher should be able to define the studies aims or questions to be addressed.

- **Research aim or questions** – the researcher should clearly outline the aim and objectives or research questions. The question will guide the appropriate methodology for the study.

- **The methodology and research design** – the researcher will describe the approach taken to undertake the study and whether a qualitative or quantitative approach will be used or if using both describe a mixed methodology. The researcher should choose the most appropriate research approach to answer the study aim(s), question(s) or hypothesis.

- **The sample** should be determined – outlining who or what the sample is, the size of the sample (which will also be determined by the approach taken), how the sample will be approached, and how the researcher will gain access to the sample.
Research and the paramedic

- **Data collection tool(s)** – the methodological approach taken will determine whether a questionnaire, interview, observations, experiment or other approach will be used to collect the data.

- **Pilot study** – the pilot study is where the data collection tool and method of collection is carried out on a small sample who will not be involved in the main study. Researchers often make some changes to their data collection tool following the pilot study.

- **Data collection** – the method used will determine how the data will be collected. If the researcher is collecting qualitative data the researcher may interview research participants. If the researcher is collecting quantitative data they may use a questionnaire.

- **Data analysis** (or making sense of the data collected) – this stage of the research process should not be underestimated in the timescale that it will take to analysis the data and produce findings. If interviews have been used to collect qualitative data the interviews will have to be transcribed prior to analysis. Quantitative data will often be entered onto a spreadsheet. Quantitative researchers often use a computer program called SPSS (Statistical Package for the Social Sciences) to facilitate statistical analysis.

- **Discussion and conclusions**– the researcher will present the findings in a format identifying common themes (qualitative) or making statistical conclusions (quantitative) and relating findings to published literature. The researcher will draw conclusions from their study’s findings and will make recommendations for practice, education and further research.

- **Dissemination** – this is a vital part of the research process. It is important that the researcher communicates their findings of the study through publications and/or presentations, locally and internationally.

**Structure of this book**

In Chapter 2 the nature of different forms of knowing involved in paramedic practice and the philosophical difference between qualitative and quantitative research approaches are discussed. The evidence based nature of paramedic practice is explored in Chapter 3. In Chapter 4 the key ethical considerations when undertaking research are considered. The conduct of a literature review is discussed in Chapter 5. In Chapters 6 and 7 an introduction to qualitative research is presented and Chapters 8 and 9 provide an introduction to quantitative research. In Chapter 10 advice on how to research clinical practice and practical recommendations on how to write for publication are offered. Chapter 11 completes the book and here future directions for paramedic research are considered.

Overall, this book provides an introduction to research and to the research process and we hope that reading this book will act as a springboard for the reader’s informed use of research and to the conduct of research projects that shape paramedic practice.
References


