

Raising the game: Nurturing research and development in the newly reconfigured ambulance services in the United Kingdom – opportunities for research for better health in prehospital settings

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Introduction

Ambulance services will need a new and robust structure to support the growing prehospital research agenda for the short and medium term. This structure will need to inform and be informed by effective knowledge management and dissemination and will need to ensure that research helps lead to high quality (Department of Health 1998), safe (no needless harm), effective (evidence-based), patient centred (no feelings of helplessness and in accordance with patients reasonable expressed wishes), timely (no needless delay), efficient (no waste and with realistic outcomes) and equitable (fair to all patients) ambulance services which are integrated with and aligned to the wider health system.

This paper recommends a structure which supports local as well as national research activity and research capacity development. In order to foster a research culture and research activity within a robust research governance framework a National Research Steering Group with representation from each ambulance service is advocated.

This national coordination and support would enable sharing of best practice, appropriate collaboration, and coordination of effort to raise the profile of research in ambulance services. As well as facilitating multicentre or even international studies it would also importantly promote self sufficiency and expertise for locally determined research led by researchers working for ambulance services supported by academic institutions as partners.

Background

The national health research strategy, Best Research for Best Health (Department of Health 2006), and the evidence required to underpin the

transformation of emergency services as set out in Reforming Emergency Care (Department of Health 2002) and more recently Taking Health Care to the Patient (Department of Health 2005) are key policy drivers for ambulance services research.

Best Research for Best Health, the new national health research strategy seeks 'to improve the health and wealth of the nation through research.' Its mission 'to create a health research system in which the NHS supports outstanding individuals, working in world-class facilities, conducting leading-edge research, focused on the needs of patients and the public' needs to support and be supported by organisational structures for ambulance and prehospital research.

The strategic goals as stated in Best Research for Best Health are to:

1. Establish the NHS as an internationally recognised centre of research excellence
2. Attract, develop and retain the best research professionals to conduct people based research
3. Commission research focused on improving health and care
4. Strengthen and streamline systems for research management and governance
5. Act as sound custodians of public money for public good.

For prehospital and ambulance research to flourish these goals should be incorporated into the structures for nurturing research and development in the newly reconfigured ambulance services in the United Kingdom.

Reforming Emergency Care cites evidence supporting new ways of working and Taking Health Care to the Patient develops this theme through two key recommendations for research and quality improvement (Annex D, p57).

1. There should be significantly improved clinical supervision, support, audit and quality assurance in ambulance control rooms to provide clinical direction and advice.

2. There should be further research to compare approaches to call handling and also to establish the level of medical support to maximise the effectiveness of the advice.

Further, this report also recommends that 'Ambulance services need to be... linked to other clinical networks such as coronary heart disease (CHD) and cancer, and [should be] following national best practice on clinical audit and research' (A2, p. 27). It is also recommended that research is undertaken to determine the development needs of ambulance staff to inform future research training (A5, p.29).

There is a dearth of high quality research on effectiveness and cost-effectiveness of prehospital care in the UK and abroad (Lerner *et al.* 2006). There is emerging evidence of a positive impact of prehospital care (Bettencourt *et al.* 2005) and a positive effect of translational research (French *et al.* 2006; Kalla *et al.* 2006; Bray *et al.* 2005) on outcomes. Prehospital research can delay inappropriate implementation of inadequately tested devices and medications or encourage further evaluation when there is uncertainty around or negative outcomes from new health technologies (Hallstrom *et al.* 2006). This area of investigation also has the potential to inform standards for benchmarking of practice (Stoykova *et al.* 2004).

Current State of Prehospital and Ambulance Research

Prehospital and ambulance research needs a coherent approach if it is to deliver the vision of contemporary health service policy which is for patient orientated world class research.

The current picture is of a number of groups which positively support ambulance services research. There are examples of good practice operating regionally and across regions which includes collaborative research including more than one regional ambulance service linked to one or more university departments specialising in prehospital or primary care.

There are many examples of good practice where ambulance services have worked in collaboration with universities to develop high quality prehospital research and also research capacity. The following are examples intended to reflect the various initiatives and this is by no means intended to be a comprehensive list.

The 999 EMS Research Forum was formed in 1999 to encourage, promote and disseminate research and evidence based policy and practice in emergency healthcare. A Board of Advisors has been formed, with members from across the UK and Australia, and from a range of specialities that contribute to this field of research.

The Thematic Research network for emergency and UnScheduled Treatment (TRUST) has been funded by Wales Office for Research and Development in Health and Social Care (WORD). This is the first national funded research network in emergency and urgent care.

London Ambulance Service is conducting research in collaboration with the Human Sciences Research Unit at the University of Hertfordshire and with the Faculty of Health and Social Care Sciences at St George's and Kingston University. The Faculty of Pre-hospital Care Research Unit at Teesside, the School of Health and Related Research, University of Sheffield, and a number of other university departments have been instrumental in developing research activity in the out-of-hospital setting working with ambulance trusts across the UK.

The British Paramedic Association Research and Audit Committee are also established to offer professional support and coordination, and have a particular focus of developing research capacity in the emerging paramedic profession.

These collaborations have involved some Ambulance Trusts and share some common membership but have often not been formally integrated or coordinated with the clinical structures or networks across the previous regional ambulance services and are not in all cases formally linked to the newly configured services or to clinical audit and quality improvement.

This integration and coordination will be essential to turn the ambulance services from organisations which have been traditionally seen as 'data rich – information poor' to bodies which themselves espouse and nurture a culture of research and innovation.

Although some studies can and should be focused in one ambulance service and will be adequately designed or powered to be generalisable, better coordination will support studies that are large enough or in a variety of settings to provide findings that are generalisable across the United Kingdom and internationally.

In addition to ensuring that research capacity is developed within ambulance services, it is important that opportunities are sought and facilitated for collaborative multi-disciplinary research which crosses the interface between primary, prehospital or acute settings. Indeed, many of the current funding streams available specifically require evidence of multi-professional collaboration.

As well as supporting the current national priority for translational research the strengthening of links between the triad of research, clinical audit (quality improvement) and knowledge management will enable the more rapid dissemination of evidence based practice and the evaluation of new models of service delivery supported by effective knowledge transfer.

In the past, not all ambulance services had robust research governance procedures in place that met the requirements set by the Department of

Health. This is evidenced by the previous failure by the majority of Ambulance Trusts to achieve national standards for research governance. This exposed the Trusts, their managers, staff and patients to risk when research was conducted. This document also seeks to ensure that all ambulance services have access to expertise and support that ensures effective research governance structures and procedures are established and maintained.

National Research Strategy and Structures in the National Health Service

NHS research strategy in Best Research for Best Health is driving the research agenda rapidly forwards in all health sectors. The key structures include the National Institute for Health Research, a virtual institute which will support future clinical researchers in the NHS, the research networks which will support high quality clinical research and research management and governance, and the new funding systems for NHS funded research.

All Health Care Organisations who lead or participate in research are required to have systems in place to ensure that the principles and requirements of the research governance framework are consistently applied (Health Care Commission standard C12). This requires an integrated governance structure which links with partner organisations and the wider health and social care community. In common with all NHS organisations, Ambulance Trusts have a legal requirement to ensure they are compliant the Medicines for Human Use (Clinical Trials) Regulation 2004 for clinical research trials and the research elements of the Mental Capacity Act 2005 before recruiting to relevant studies.

Ambulance Services are included in the planned configurations for Comprehensive Local Research Networks (CLRNs) which will administer the new 'bureaucracy busting' processes for research management and governance as well as funding for Service Support Costs to support additional health service costs of participating in clinical research. However, Ambulance

Trusts will still need to have arrangements either alone or in partnership with other healthcare organisations to administer governance arrangements for 'own account' and student research projects which will not be adopted by the CLRNs.

The CLRNs together with the six Topic Specific Research Networks (TCRNs) and a Primary Care Research Network (PCRN) will make up the Clinical Research Network for England (CRN-E) which aims to provide a world class NHS infrastructure for clinical research. The CRN will extend the activities of the Clinical Research Network for England to all aspects of healthcare including ambulance services so it is important that Ambulance Services are represented and active in these networks.

These Department of Health (DH) structures, through funding and adoption of studies, will be the primary means for determining research priorities and they will interact in this regard with the research (funding) councils such as the Medical Research Council (MRC) and Economic and Social Research Council (ESRC) as well as health research charities such as the British Heart Foundation, Wellcome and the Health Foundation.

A synergistic relationship with these structures to encourage and increase ambulance research activity will be important in order for ambulance services to be able to bid and compete for national and international funding in partnership with other healthcare organisations and Higher Education Institutions.

Research Capacity

Research capacity building, is the 'process of individual and institutional development which leads to higher levels of skills and greater ability to perform useful research" (Trostle 1992).

Building research capacity will be a key factor in producing a sound evidence base for decision-making in policy and practice (Cooke 2005) and will be a prerequisite for the development of a research culture within ambulance services.

As well as national competitive capacity development funding through DH and MRC, for example Doctoral, Post-Doctoral and Career Scientist awards, ambulance services need to work collectively to share expertise and to support and source funding for capacity development.

Examples of capacity development with Research Development Support Units (Dyas *et al.* 2005), 'own account' and other initiatives will be essential to developing a research culture within ambulance services and to develop talented researchers as well as reflective practitioners within the organisations (Department of Health 2000).

Organisational support for research, collaboration with Higher Education Institutions and the development of expertise in accessing funding are some of the elements required for this. In developing research capacity novel research, proposed by researchers themselves that fit with the strategic aims of the organisation, would need to be supported by the organisation as well as identified national priority areas.

It will also be vital to draw on existing external expertise to support the development of internal research capacity. The Ambulance Service research strategy should emphasise that funded opportunities for involvement of ambulance professionals be included in research proposals, whether generated internally or externally. This will ensure that where possible or desirable, ambulance personnel, whether clinical or non-clinical, are real partners in research collaborations rather than simply providing access for other organisations to conduct research on ambulance services.

Future Research Needs of Ambulance Services

A future structure for ambulance research needs to collate what work has been done and is being done in prehospital and ambulance research in a repository parallel to and linked with that currently documented in the National Research Register.

There will be ongoing need for identification of research priorities and agenda setting which will need to be informed by ambulance service research leads, clinical audit leads, clinical directors and chief executives as well as academic institutions and groups with an interest in prehospital research.

Such coordination will also facilitate data collection within and between ambulance services and the establishment of links to other parts of the patient pathway that can help to generate real information from raw data (Cameron *et al.* 2005; Sprivulis *et al.* 2006).

An Integrated Structure to Support Ambulance Services Research

A suitable structure is envisaged which will support interaction between knowledge management, quality improvement and research (Figure 1). Research will need to be supported by collaborative relationships and expert advice in order to develop the capacity for own account research led by researchers working for ambulance services.

There will also need to be support to undertake independent expert peer review of research proposals as part of Central Office for Research Ethics Committee requirements most likely in partnership with other healthcare trusts and academic organisations.

A Vision for Future Prehospital and Ambulance Research

For Ambulance Trusts and clinicians to be users of, collaborators in and initiators of high quality research to support a truly evidence based service, will require structures that encourage and support a culture of evidence based

practice, research and innovation placing ambulance services at the leading edge of patient focused service delivery.

The purpose of these structures should be to promote a sustainable infrastructure capable of identifying and responding to research needs in the short, medium and long-term. The aim should be to support own account research while fostering collaboration and sharing of expertise and research outputs for the betterment of patient care and staff development.

A key part of these structures would be a National Research and Development Steering group for ambulance research, including leads or representatives from the regional ambulance services. This group would need to relate synergistically with audit and guidelines developments groups as represented in the potential structures shown in Figure 1 and 2 below.

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Figure 1 Possible Structures and Relationships for Clinical Leadership, Clinical Audit, Knowledge Management (Clinical Effectiveness) and Research in the Ambulance Service

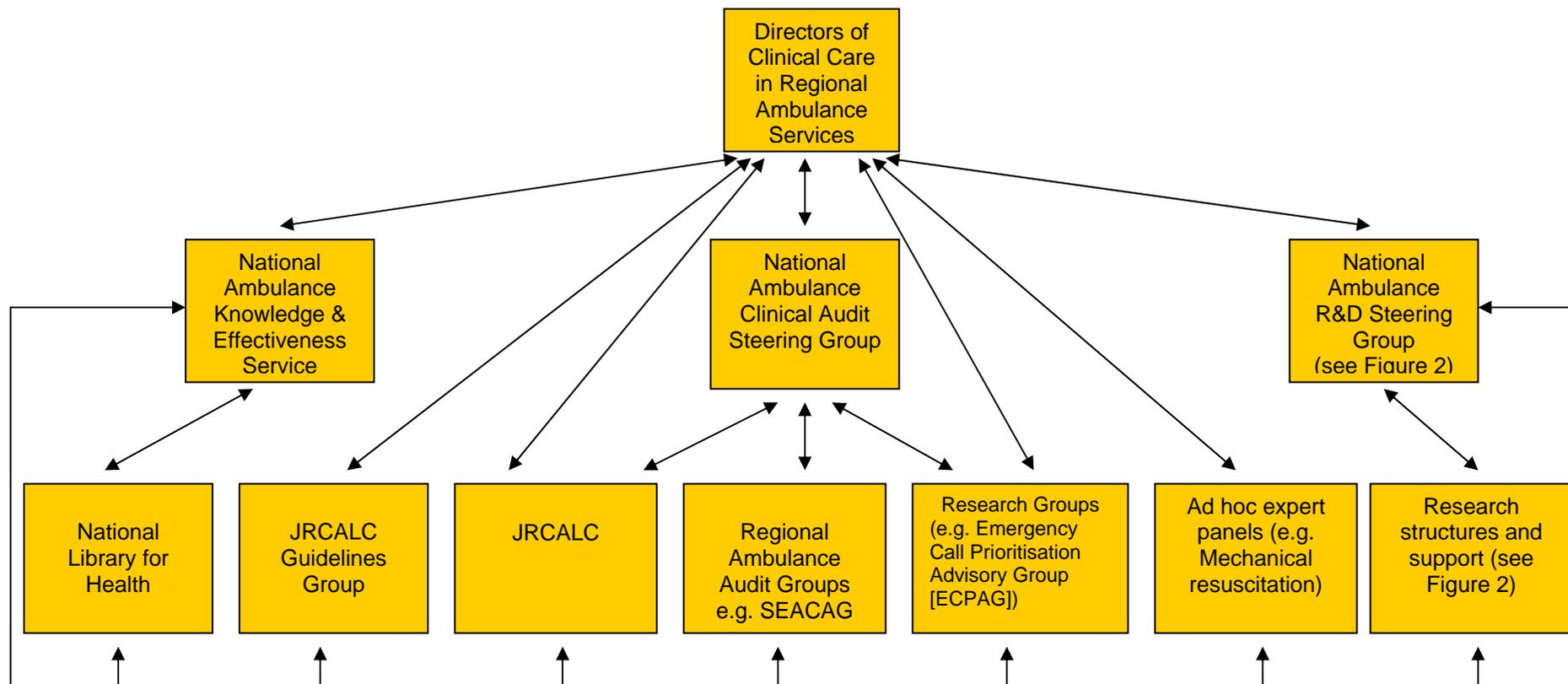
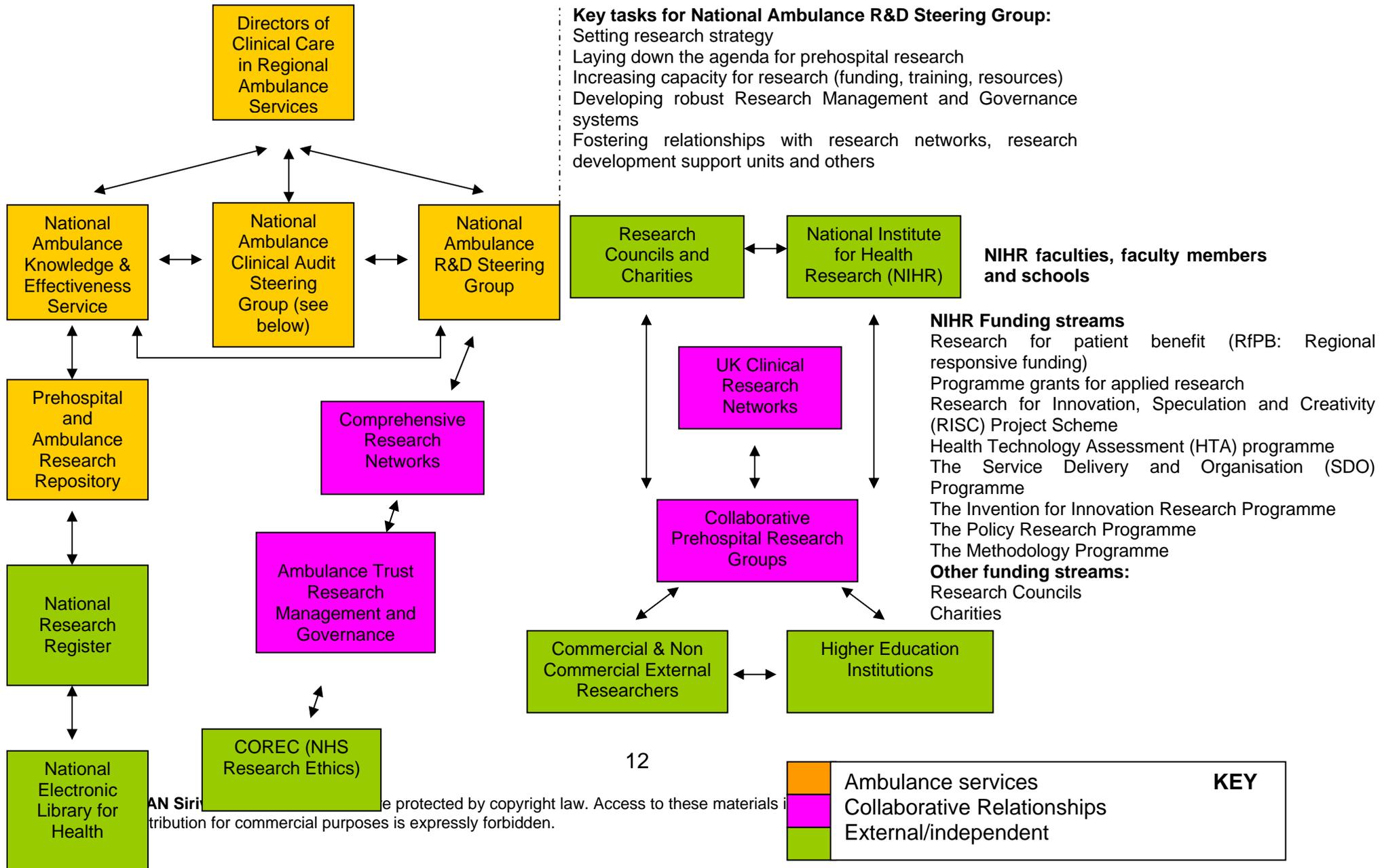


Figure 2 A Framework for Research and Development for Ambulance Services



References

Bettencourt N, Mateus P, Dias C, Mateus C, Santos L, Adao L, Sampaio F, Salome N, Goncalves C, Simoes L, Ribeiro VG (2005) Impact of pre-hospital emergency in the management and prognosis of acute myocardial infarction. *Rev.Port.Cardiol.* **24**, 863-872.

Bray JE, Martin J, Cooper G, Barger B, Bernard S, Bladin C (2005) An interventional study to improve paramedic diagnosis of stroke. *Prehosp.Emerg.Care* **9**, 297-302.

Cameron PA, Gabbe BJ, McNeil JJ, Finch CF, Smith KL, Cooper DJ, Judson R, Kossmann T (2005) The trauma registry as a statewide quality improvement tool. *J.Trauma* **59**, 1469-1476.

Cooke J (2005) A framework to evaluate research capacity building in health care. *BMC.Fam.Pract.* **6**, 44.

Department of Health (1998) 'A first class service - quality in the new NHS.'
Department of Health,London

Department of Health (2000) 'A health service of all the talents.' DOH,London

Department of Health (2002) 'Reforming emergency care: first steps to a new approach.' DOH,London

Department of Health (2005) 'Taking healthcare to the patient: Transforming NHS ambulance services.' DH,London

Department of Health RaDD (2006) 'Best Research for Best Health. A new national health research strategy.' DH,London

Dyas J, Moody L, Siriwardena AN (2005) Improving research quality and health in rural areas: a case study of the contribution of a teaching primary care trust. *Quality in Primary Care* **13**, 183-190.

French SC, Salama NP, Baqai S, Raslavicus S, Ramaker J, Chan SB (2006) Effects of an educational intervention on prehospital pain management.

Prehosp. Emerg. Care **10**, 71-76.

Hallstrom A, Rea TD, Sayre MR, Christenson J, Anton AR, Mosesso VN, Jr., Van OL, Olsufka M, Pennington S, White LJ, Yahn S, Husar J, Morris MF, Cobb LA (2006) Manual chest compression vs use of an automated chest compression device during resuscitation following out-of-hospital cardiac arrest: a randomized trial. *JAMA* **295**, 2620-2628.

Kalla K, Christ G, Karnik R, Malzer R, Norman G, Prachar H, Schreiber W, Unger G, Glogar HD, Kaff A, Laggner AN, Maurer G, Mlczoch J, Slany J, Weber HS, Huber K (2006) Implementation of guidelines improves the standard of care: the Viennese registry on reperfusion strategies in ST-elevation myocardial infarction (Vienna STEMI registry). *Circulation* **113**, 2398-2405.

Lerner EB, Maio RF, Garrison HG, Spaite DW, Nichol G (2006) Economic value of out-of-hospital emergency care: a structured literature review. *Ann. Emerg. Med.* **47**, 515-524.

Sprivulis P, Da Silva JA, Jacobs I, Jelinek G, Swift R (2006) ECHO: the Western Australian Emergency Care Hospitalisation and Outcome linked data project.

Aust. N.Z. J. Public Health **30**, 123-127.

Stoykova B, Dowie R, Bastow P, Rowsell KV, Gregory RP (2004) Ambulance emergency services for patients with coronary heart disease in Lancashire: achieving standards and improving performance. *Emerg. Med. J.* **21**, 99-104.

Trostle J (1992) Research capacity building and international health: Definitions, evaluations and strategies for success. *Soc Sci. Med.* **35**, 1321-1324.