

Extended Roles for Allied Health Professionals in the NHS

Report for the National Co-ordinating Centre for NHS Service Delivery and Organisation R & D (NCCSDO)

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Executive Summary

Introduction

Within the UK, efforts to modernise the health service include a specific focus on reconsidering the roles of non-medical members of the health care team. This report details a research project utilising systematic review methods to elicit and critique published and unpublished literature about extended scope practice (ESP) in five allied health profession (AHP) groups.

The main aim of this review was to identify, appraise and summarise extended scope of practice in five allied health professional groups, thereby consolidating the evidence base for such innovations.

Scoping the literature revealed an apparent dearth of robust evaluative research and the review therefore addressed two specific objectives or phases.

Phase 1 To define the range of extended or enhanced practitioner roles within five allied health professional groups.

Phase 2 To evaluate the effectiveness of extended practice in allied health professionals from published literature and other sources in relation to:

- the impact on patients,
- the impact on other health professionals,
- the impact on health-services delivery (with a particular emphasis on the NHS).

Given the breadth of terminology used in the area, a broad search strategy was required and there were no limits according to time period or language. Over 7000 possible sources were identified, 355 of which contained information relevant to the topic. Twenty-two papers were of sufficient quality to be considered for data extraction with the remaining 333 considered for descriptive information only.

The review found that despite the introduction of extended scope roles across all of the professional groupings considered,¹ evidence about the impact of these new roles is limited. To date, the main focus has been concerned with imperatives such as reduced demand on medical colleagues and reduced waiting lists. The majority of reports were audits, satisfaction surveys, points-of-view papers or position statements. There were some individual case reports of note but there were few qualitative studies or robust trials.

¹ Physiotherapy, occupational therapy, speech and language therapy, radiography and paramedics.

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The evidence considered in this review has suggested that AHP-ESP interventions can indeed contribute to improved ease and speed of access to specialist services that can be provided. An increasing number of studies, particularly in radiography and paramedic practice, have suggested that improved access to specialist interventions does lead to improved patient outcomes although concerns have also been raised.

Whereas ESP is heralded by many to be a good thing, there is as yet little evidence to support this. We would strongly suggest that an increased focus on health outcomes for patients is required in the development of ESP roles. Despite being identified as important by practitioners and researchers, such outcomes have been evaluated infrequently to date. In addition, it is necessary to consider NHS outcomes that are less immediately obvious, such as the impact on routine services having lost experienced AHPs to ESP roles. Finally, explicit consideration of how best to prepare AHPs for these new roles is required given a climate where accountability is rightly high on every professional's agenda.

Innovation in practice must have a solid underpinning if we are to maximise the benefit for patients and indeed limit any deleterious effects. With the introduction of The Ten Key Roles for AHPs and the increased activity of the Changing Workforce Programme, it appears both timely and opportune that there is a higher profile to focused evaluation and strengthened evidence of AHP-ESP. Such evaluation is vital if we are to concentrate our efforts and expenditure in a way that is most beneficial for our patients. Indeed, we would suggest that specific and robust investigation is urgently required if we are to develop evidence-based policy around ESP in AHPs.

Specific implications and recommendations

- Evidence suggests that AHPs are able to perform a range of advanced practices that have been undertaken traditionally by medical practitioners.
- Pragmatic local evaluations should be incorporated when introducing role development.
- Despite the contribution of local evaluations, robust trials comparing ESP interventions and 'routine' management are required urgently.
- Further evidence about the impact of ESP on patient outcomes (such as health, reduced disability and improved quality of life) is required.
- Cost-effectiveness trials considering comprehensive costings, including hidden costs, are required.
- A consensus regarding a common language for ESP would be advantageous.

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- Further investigation of ESP views about barriers to extending practice should be sought.
- Further investigation on how best to prepare and support those in ESP roles is required.
- Further development of AHP awareness and skills of research and the evaluation of treatments or interventions is required.
- Moves towards more co-ordinated training and education of ESP AHPs should be investigated with a view to standardisation of high-quality care while allowing for local difference in service requirements.

The Report

Section 1 Background to the study

1.1 Introduction

Health services internationally are increasingly faced with the need to ensure that health-care professionals provide the most appropriate and timely care to patients. Within the UK, efforts to modernise the health service include a specific focus on reconsidering the roles of non-medical members of the health-care team. In particular, we have recently seen an increasing drive towards the development of a flexible workforce, where multiple professionals are able to take on tasks traditionally seen as the domain of one profession (Department of Health, 2000a, 2000b). Thus, the NHS has seen the creation of a host of new roles. In allied health professions (AHPs) these roles are divided broadly into four tiers (Department of Health, 2000a, 2000b):

- 1 assistant practitioners,
- 2 registered practitioners (entry-level AHPs),
- 3 advanced practitioners (clinical specialists and extended scope practitioners),
- 4 consultant practitioners.

This study explored evaluations of extended scope practice (ESP) in allied health professionals (AHP-ESPs).

Information about nurses in extended roles has grown enormously over the last few years (British Medical Association Health Policy and Economic Research Unit, 2001; Kinley *et al.*, 2001; Read *et al.*, 2001) with some recent studies evaluating the impact of new roles on patients' wellbeing and outcome. However, comparatively little research about such practice in AHPs exists in easily accessible literature (Read *et al.*, 2001; Sibbald *et al.*, 2002, 2004).

This report details a research project utilising systematic review methods to elicit and critique published and unpublished literature about ESP in five AHP groups. The particular emphasis was twofold: firstly to describe the range of ESP roles and secondly to evaluate the strength of evidence for its effectiveness, efficiency and responsiveness to patient and NHS needs.

Four principles have guided the writing of this report:

- rigorous methods for systematic review have been incorporated at each stage of the process;
- we have attempted to present information in a way that enables easy access to that information most relevant to individual AHP

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groups reviewed² and to foster cross-fertilisation of ideas between the different disciplines;

- although we have explored the impact of ESP on a range of stakeholders (including the AHPs themselves, other health professionals and the NHS), the key stakeholder in health-service improvement is identified as the patient or patient population;
- both the strengths and weaknesses of ESP practice and knowledge are identified so that gaps can be recognised and addressed in future developments, policy and research.

The major sections of this report are contained in subsequent sections, including the methodology and findings. However, in order to provide a context for the study, brief attention will be provided within this introductory section to:

- what is ESP?
- why is ESP in the AHPs of interest?
- what do we currently know about ESP?
- specific study objectives.

1.2 What is ESP?

Defining ESP is not straightforward and the field is beset by multiple definitions and variable interpretations. Perhaps the most frequently used definition is that produced by Collins *et al.* (2000), who suggested that ESP practitioners were

...clinical specialists with an extended scope of practice i.e. working beyond the recognised scope of practice of the profession of interest in innovative or non-traditional roles.

Collins *et al.* (2000)

This first aspect of Collins *et al.*'s definition focuses on moving beyond 'recognised scope of practice'. While clearly important in relation to professional competencies and legislation, such a concept is fairly unwieldy in a review due to the continuous change of scope over time. For example, whereas some interventions (e.g. injecting by AHPs) were ESPs at the outset of data collection, policy change within professional bodies means that these roles may no longer be strictly considered ESP.

The second half of the definition suggested by Collins *et al.* is that ESP comprises 'innovative or non-traditional' working. While on the surface this is perhaps a little more manageable, this term could encompass almost boundless activity. Sibbald *et al.* (2002, 2004) recently proposed a framework that potentially offers a more pragmatic way forward for interpreting and applying 'innovative or non-traditional' working. They suggest seven different aspects of role development in relation to skill mix, two of which seem most appropriate in considering ESP:

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- 1 enhancement: increasing the depth of a job by extending the role or skills of a particular group of workers;
- 2 substitution: expanding the breadth of a job, in particular by working across professional divides or exchanging one type of worker for another.

The five other categories Sibbald *et al.* (2002, 2004) described are of less direct relevance to ESP, although of interest to other aspects of workforce change. These include:

- 3 delegation: moving a task up or down a traditional uni-disciplinary ladder;
- 4 innovation: creating new jobs by introducing a new type of worker;
- 5 transfer: moving a service from one health-care sector to another;
- 6 relocation: shifting the venue of a service from one health-care sector to another;
- 7 liaison: using specialists in one health-care sector to educate and support staff working in another sector.

For the purpose of the review we have considered ESP to be 'AHP activity including some aspect of enhancement or substitution'. To ensure a better understanding of AHP-ESP (including how to introduce it and how to evaluate it) we have considered such roles regardless of when they were introduced. For instance, some roles may no longer be considered ESP but they have been included in the review as they are relevant for interpreting ways forward in improving health professional response to improving patient care.

1.3 Why the interest in ESP?

1.3.1 Interest in ESP at a government or macro level

Interest in improving the delivery of health services is neither new nor restricted to any one country, style of health service or stakeholder. In the UK, new roles including ESP are increasingly identified as part of the Government's Strategy for Change and agenda of 'modernising the NHS'. It appears that the main drivers of this agenda have been reducing waiting lists and meeting the demands of an over-stretched medical workforce. Indeed, this perspective still receives most public attention as listeners to national media will be aware.

Recent developments, including the New Deal European Working Time Directive,³ have resulted in reduced hours for junior medical staff, making it likely that workforce shortages and the economy will remain key drivers of the UK interest in ESP. However, a broader perspective than this is expressed by the Changing Workforce Programme (CWP;

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part of the Modernisation Agency of the NHS), dedicated to promoting a co-ordinated NHS response to new ways of working.

The CWP recognises that workforce shortages and economic factors are important drivers in workforce developments. However, increasingly, new ways of working are suggested to be about ensuring effective and responsive health services and staff.

In other countries, organisations with similar remits have been/are being set up, including in Australia and some parts of Europe. Over the past 18 months there has been a rapid expansion of government information about ESP roles with a number of pilot projects facilitated by the CWP starting to produce findings. This allows a baseline of information to be collated and explored in relation to other evidence about what is going on, albeit how ESP in AHPs is improving services for patients, how it is impacting on NHS priorities and how it is impacting on AHPs and other health professionals themselves.

1.3.2 Interest in ESP at a health-professional level

A number of additional factors appear to contribute to the growing interest of health professionals in ESP. In nursing, which has a longer history of ESP than AHPs, suggested factors include meeting the modernisation agenda, increased job satisfaction, a sense of autonomy in practice, role and career development, recruitment and retention. While the Exploring New Roles in Practice Study (ENRIP; Read *et al.*, 2001) included some exploration of AHP-ESP, far less collated information is accessed easily about why AHPs are involved in ESP and what they are doing.

Further, ESP is likely to impact on professionals other than those delivering the ESP. In particular, professionals may either benefit or experience negative consequences, including those whose role has been altered due to expansion or substitution of a new role or non-ESP practitioners within the same discipline.

Our early scoping work found that many of the professional bodies or organisations associated with AHP practice had both dedicated policy about ESP and/or interest groups, newsletters and conferences. Collating this information should enable a clearer identification of the professional buy-in to ESP in AHPs, and the rationale for that perspective.

1.3.3 Interest in ESP at the patient level

Addressing the question of the patients' perspective of expanded or substituted roles is clearly of interest. There are indications that patients wish direct access to AHPs and that shorter waiting times are preferred. Collating information on the user perspective should enable a better understanding of how the government agenda and health professionals' drives for change meet that which is desired by patients.

1.4 What is the level of knowledge about ESP in AHPs?

ESP is of growing interest at a range of levels and to a range of stakeholders. However, a clear and concise statement of what we actually know regarding what ESP comprises and what it achieves is not reached easily. Part of the reason for this is that the research which has been done tends to be disparate and difficult to access. This is perhaps to be somewhat expected given the recency of both the professions concerned and indeed the modernisation agenda. Nevertheless, attempting to establish this is crucial if we are to prioritise the most appropriate workforce developments and deploy staff in the most beneficial manner.

At the time of undertaking this study, descriptive information about nurses in extended roles was relatively easy to access. The same could not be said for AHPs with little information available in the published literature. At the level of evaluation, there appeared to be comparatively few studies focused specifically on patient outcomes and the impact on health-service organisations in any health-professional group. It did appear that tasks done traditionally by one group could be applied by others. For example, appropriately trained nurses were reported to be able to carry out pre-operative assessments as efficiently as pre-registration house officers (Kinley *et al.*, 2001), and specially trained physiotherapists appeared able to assess orthopaedic outpatients as effectively as post-Fellowship junior orthopaedic surgeons (Daker-White *et al.*, 1999). However, other studies of ESP produced quite contradictory findings. For example, a survey of hand therapists (physio- and occupational therapists) indicated that their ESP development was driven largely by political reasons, such as reducing waiting lists (Ellis and Kersten, 2001). At the same time, a survey of hand surgeons working with these extended-scope hand therapists indicated that the initial reduction of the waiting list was soon – at least in some ways – impacted on by increased referrals from other sources (Ellis and Kersten, 2002).

Despite the promotion of AHP role enhancement within government policy, there appears to have been a lack of systematic evaluation of the impact of using extended-role practitioners, in particular the impact on patient outcomes. Such evidence is required if we are to ensure that the benefits of such practice are maximised and any risks to patient care minimised.

1.5 Objectives of the study

The main aim of this review was to identify, appraise and summarise extended scope of practice in five allied health professional groups, thereby consolidating the evidence base for such innovations.

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Scoping the literature revealed an apparent dearth of robust evaluative research and the review therefore addressed two specific objectives or phases.

Phase 1 To define the range of extended or enhanced practitioner roles within five allied health professional groups.

Phase 2 To evaluate the effectiveness of extended practice in allied health professionals from published literature and other sources in relation to:

- the impact on patients,
- the impact on other health professionals,
- the impact on health-services delivery (with a particular emphasis on the NHS).

The next section outlines the methods used in the review.

Section 2 Review methods

Both phases of the review incorporated methods of systematic review proposed by the Cochrane Collaboration (Clarke and Oxman, 2001; Olsen, 2001). However, given our intention to collect information that described ESP as well as that which measured its impact (see Section 1.5) it was necessary to use an expanded approach. To that end search and selection criteria were broader than is sometimes found in systematic reviews. In addition, strategies for evaluating the content and quality of material required adaptation.

2.1 Selection criteria

The search strategy was not limited to any particular study design and included both qualitative and quantitative studies. In addition, commentaries, theoretical papers and position statements were actively sought out in order to be able to meet the goals of Phase 1 (description; see Section 1.5).

Studies reporting data (as opposed to mere service description) were evaluated according to explicit quality criteria recommended by Cochrane Protocol review guidelines (Clarke and Oxman, 2001, ch. 6). Quantitative studies that we aimed to find included:

- randomised, controlled trials,
- controlled clinical trials,
- controlled before and after study,
- interrupted time series.

The guidelines of the Cochrane Non-Randomised Studies Methods Group (NRSMG; Olsen 2001) were used as a guide to reviewing other study types (which included both non-randomised quantitative studies and qualitative work).

Given the anticipated lack of formal research about AHP-ESP, we also aimed to include pragmatic audits, descriptive studies, theoretical pieces, policy documents and informative letters, although these may well not contain data.

Selection was not restricted according to the language in which articles were written or the year of publication.

2.2 Data management

Information obtained in the review was imported and managed in bibliographic software (Reference Manager, version 10). A Microsoft Access database was designed for the data-extraction process. A copy of the database framework shown in Appendix 3. Due to the

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heterogeneity of data, synthesis was limited to descriptive synthesis and did not include meta-analysis.

2.3 Search strategy

The search strategy attempted to include available published evidence and grey research literature (including from health-care systems other than the NHS). The search strategy was developed with input from a specialist medical librarian and health informatician (AB). Given the complexity and breadth of the topic and the variable language used by clinicians, researchers and others in relation to ESP, a comprehensive search strategy was required. The initial search strategy was extended as a result of initial searching having revealed additional potential key terms (Appendix 1a). In addition, an abbreviated version was developed for use with less-sophisticated databases not allowing multiple Boolean operators (Appendix 1b).

The following sources were used.

- Electronic sources: Cochrane Database of Systematic Reviews and Cochrane Controlled Trials Register, Medline, Embase, CINAHL, Web of Sciences, Ahmed, Psychlit/PsychINFO, PEDRO Database of Physiotherapy evidence and other sources identified in primary searches.
- Manual searches of journals not entered on any of the above electronic sources (e.g. some professional journals and reference-list scanning).
- NHS Economic Evaluations Database.
- Unpublished studies were searched using the System for the Information on Grey Literature in Europe (SIGLE), the Index of Conference Proceedings (OCLC Firstsearch) and the British PhD Theses database.
- Bibliographies of retrieved papers were scanned and examined for relevance.
- Research in progress was identified via the National Research Register, the National Co-ordinating Centre for NHS Service Delivery and Organisation and Department of Health research registers, Medical Research Council Register, Current Research in Britain (CRIB), Current Controlled Trials (www.Controlled-trials.com) and HSRProj (current USA projects).
- Personal contact with membership of professional bodies, and requests for information to relevant electronic mail and usenet discussion groups.
- Personal contact with key researchers and practitioners in the field via e-mail lists, professional interest groups and by informing people about the project (including setting up a website; www.sohp.soton.ac.uk/shprs/index.htm).

2.4 Outcomes of interest

As Phase 2 (see Section 1.5) explicitly explored evaluation of the impact of extended practice, studies were included if they used measures of patient outcome or impact on health-care delivery. It was expected that studies of very different models of extended practice would be included in the review and therefore a wide range of outcome measures would emerge. Outcomes of specific interest included:

- health outcomes for patients;
- other patient outcome or surrogate outcome, providing there is evidence or theoretical rationale that the outcome might relate to the implementation of extended practice;
- health-care resource utilisation, including waiting lists and waiting times, frequency and length of hospital stay, number of re-admissions, prescriptions, tests and investigations ordered, referrals, use of emergency and other health services;
- costs of development and delivery of extended practice interventions and any associated monetary benefits.

2.5 The review process

The same processes of collecting and screening data were used in both phases of the study.

2.5.1 Abstract screening

All resources identified were pre-screened by one reviewer for relevance. In order to ensure reliability and to minimise selection bias, all papers selected as relevant were checked against these criteria independently by a second reviewer. In addition, those abstracts not considered relevant by the first reviewer were dual checked to ensure maximum coverage of relevant material. This process was monitored by the use of an abstract-screening record (Appendix 2a). The first 700 abstracts were screened by each of the four members of the team involved in screening to provide training and achieve an acceptable level of reliability.

2.5.2 Quality screening

The full text of all studies that were considered potentially relevant were then obtained for further assessment and assessed for data content and quality. In cases where the content was relevant and data present, a full quality evaluation was carried out based upon criteria utilised by the Critical Appraisal Skills Programme (CASP),² Centre for Reviews and Dissemination at the University of York and others (Appendix 2b). The quality information was then summarised and a

² <http://www.phru.nhs.uk/~casp/casp.htm>; <http://www.york.ac.uk/inst/crd/welcome.htm>

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judgement made about whether the information was robust and therefore suitable for data extraction and possible synthesis (Appendix 2c). All papers with data were screened by two reviewers with discrepancies discussed between the reviewers and the lead applicants in order to reach a consensus decision. The two research assistants (DK and GF) along with the two lead applicants (KM and PK) carried out most screening and analysis, with other applicants contributing in their areas of specific expertise (in particular, SG for radiography and VL for emergency care).

2.5.3 Extraction of information or data

In cases where the quality summary indicated that caution should be exercised in synthesis (i.e. where there were clear methodological flaws), or when the work was relevant but did not include data (such as in the case of descriptive reports or theoretical pieces), the paper proceeded to descriptive information extraction (Appendix 2d), where details of the study were entered into an Access database.

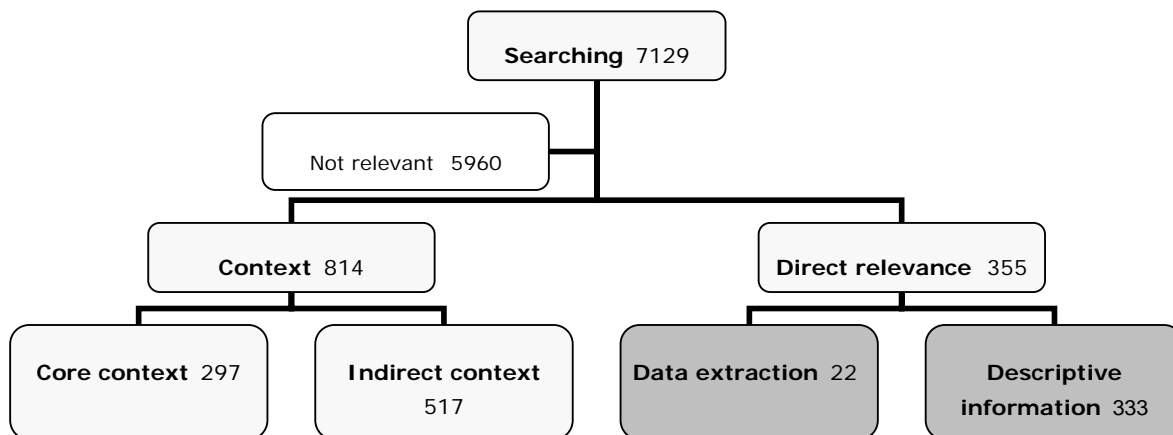
Data extraction was undertaken on papers which passed the quality-screening stage. This was carried out independently by reviewers and recorded on an Access database. Data-extraction entries were checked and amended by a second reviewer. Discrepancies were discussed between the data extractors and lead applicants for a consensus decision. Where data were missing, attempts were made to contact the first author to complete the information necessary for the critical appraisal; however, given time restraints this was minimal. Studies that were published in duplicate were included only once. In the case of papers/reports being linked to other work, such links were noted and reflected in the database.

Section 3 Results

3.1 Summary of the review findings

Figure 3.1 shows the number of papers resulting from each stage of the review process.

Figure 3.1 Papers from each stage of the review process (following report update, May 2004)



3.1.1 Papers not considered in the review

The above table indicates that the search strategy revealed a large number of papers that were irrelevant to the topic (inherent to a search strategy embodying variable terminology).

On review, some papers were thought to be of potential interest to the wider context of the changing environment of clinical services and professional roles although not actually relevant to a review on ESP. In addition, some fields of clinical work have incorporated collaborative or flexible working over many years (including teamwork in rehabilitation and other fields). Given that the skills associated with team working and communication, patient support and education are central to the work of each of these practitioners, work on these issues was not included in the review if ESP issues were not involved explicitly. Contextual papers of this nature (either core or indirect; see Appendix 2a) were collated but not reviewed in detail. Interested parties should contact the authors of this review for further details.

3.1.2 Papers of direct relevance

Of the 355 papers found relevant, only 22 progressed to full review and data extraction. The main reason for this was because either no qualitative or quantitative data were contained in the paper (in the case of discursive and opinion pieces) or because data quality was

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compromised. However, the 333 papers that did not meet the inclusion criteria for data extraction did contribute to our understanding of the diverse nature of ESP and, to that end, they were also considered as an aid to understanding the issues confronting AHP-ESP.

Due to the heterogeneity of study design, interventions and measures, synthesis is necessarily restricted to a descriptive approach.

3.2 Data extraction³

3.2.1 Who is doing ESP research?

Of the 22 papers considered suitable for data extraction, the majority were from the UK ($n=18$), with three from the USA and one paper containing data from several countries. Table 3.1 below demonstrates the distribution across the professions considered.

Table 3.1 Distribution of studies used for data extraction across the professions considered

Professional group	Number of studies
Radiography	7
Paramedics	7
Physiotherapy	5
Occupational therapy and physiotherapy	2
Speech and language therapy	1

3.2.2 Why is ESP research being done?

Where the driver for the research was stated explicitly, this was also collated. The most frequent driver was to address the knowledge gap about ESP ($n=6$). Although five authors identified 'improved patient outcome' as a driver only two of these papers actually assessed patient outcomes other than satisfaction with services (e.g. improved health status, reductions in disability). A further paper stated that the research was being done to bring about improved services.

Four others suggested that the ESP service they were describing and evaluating had emerged in response to either national or local service demands (such as excessive demand on consultant services or shortage of trained medical experts). Three studies considered 'patient demand' to be the main driver although this was linked mainly to similar issues of service demand, such as improving timely service delivery and reducing waiting lists.

One paper stated that the main driver was professional enhancement.

³ All papers for data extraction are listed in Appendix 5.

3.2.3 Health-professional group data meeting data-extraction requirements

A description of the research is provided below with details of publications in Appendix 5. The update to the report (May 2004) resulted in a number of additional papers (as shown in Figure 3.1; Appendix 4 shows the incomplete search results from December 2003 and those from May 2004, for comparison), with two further papers being found that met criteria for data extraction (refs 412 and 399; see below and Appendix 5).

3.2.4 Radiography

Both diagnostic and therapeutic studies were found with one very early paper (Parker *et al.*, 1972, ref 300; see below and Appendix 5) exploring attitudes to delegation of radiological tasks across both therapeutic and diagnostic activities. On balance, evidence is accruing that radiographers are able to be trained in both diagnostic and therapeutic skills to a level of performance that is similar to medical colleagues and acceptable to patients, after postgraduate training.

Reducing errors in the accident department: a simple method using radiographers (Berman et al., 1985; ref 349)

Casualty radiographs examined by casualty officers and radiographers were compared with two consultant radiologists (gold standard).

- 1496 films: abnormalities were missed in 68 films by radiographers, in 63 by casualty officers (35 common to both groups): 28 of the films interpreted wrongly by doctors were interpreted correctly by radiographers (16 clinically significant).
- The authors concluded that radiographers should signal abnormalities as standard practice.

A study to evaluate the introduction of a pattern recognition technique for chest radiographs by radiographers (Hughes et al., 1996; ref 339)

Pre-/post-tutorial changes in radiographer film-reporting performance, comparing radiographers with radiologists.

- Radiographers successfully acquired the pattern-recognition technique.
- The use of the technique improved sensitivity, specificity and predictive values, and decreased false-positive and false-negative rates.
- The authors concluded that although there was fair agreement between radiographers and radiologists, radiographers were still 'over reporting' (false positives).

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Radiographers as film readers in screening mammography: an assessment of competence under test and screening conditions (Pauli et al., 1996; ref 347)

The study followed radiographers longitudinally pre- and post-training and after 1 year.

- Agreement between co-reading radiographers was almost as high as that between radiologist/radiographer pairs.
- The data suggested that acquired skills, if practised, are maintained over time.
- The authors concluded that the study supports the concept of suitably trained radiographers in dual reading of mammograms with radiologists rather than radiographers completely replacing radiologists.

Radiation dose and diagnosticity of barium enema examinations by radiographers and radiologists: a comparative study (Crawley et al., 1998; ref 328)

The study compared the dose area product (DAP) used by radiographers and radiologists during barium enema examinations.

- Radiographers did not use significantly higher DAP for the screening examination.
- Radiographers had to produce extra films for reporting for the radiologists, resulting in significant increases in DAP overall.
- It was concluded that future analysis is required to determine if overall DAP remains increased to determine whether this extended role should be continued in the Trust.

Radiographer-performed barium enemas – results of a survey to assess progress (Bewell et al., 1996; ref 338)

Questionnaire survey to radiographers delegated to perform barium enemas and who had attended a training course.

- Complication rate for radiographers was low and similar to that for radiologists.
- Radiographers reported difficulties with training: (1) suggested procedures on the training course differed to those suggested by the radiographers' own consultant radiologist colleagues, resulting in conflict; (2) there was a lack of radiology supervision in periods of staff absence; (3) there were difficulties in establishing a single protocol when there were multiple supervising consultant radiologists.

Delegation of tasks in radiology to allied health personnel. Reaction of radiologists (Parker et al., 1972; ref 300)

262 radiologists in five USA states were asked their feelings about delegating 26 radiological tasks.

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- Some 25% of consultants agreed with delegating injection of contrast materials, 40% agreed with delegating fluoroscopy, 25% agreed with delegating interpretive tasks.
- Delegation of 'all tasks' was disapproved of by 60% of doctors.
- This was an early study, which was reflected in the finding that none of the discussed tasks were being delegated to radiographers.

Longitudinal changes in extended roles in radiography (Price et al., 2002; ref 327)

This survey gathered responses about the adoption of ESP in radiography from radiology managers ($n=172$).

- The results showed that ESP had been adopted haphazardly.
- Tasks adopted were intravenous injections (94%), barium enemas (69%), red dot schemes (82%) and reporting (ranging from 12 to 25% depending on the area of the body).
- Radiographers at non-teaching hospitals were more likely to undertake barium enemas and use the red dot scheme.
- The study concluded that the extent to which hospitals are utilising the developing skills of radiographers has important implications for future education and training needs for radiographers and for delivery of imaging services.

3.2.5 Paramedics

Most of the work evaluating extended roles in paramedics has, like radiography, focused on specific skill acquisition. In particular, there has been a number of studies about prehospital thrombolysis (PHT) and its impact on reduced mortality, showing that PHT by paramedics would meet the NHS call-to-needle guidelines, without increased risks to patients.

Myocardial Infarction Triage and Intervention Project (Weaver et al., 1990; ref 412)

Feasibility study to see if it is safe for paramedics to assess for PHT.

- Three hours of training provided for paramedics to undertake this additional intervention.
- Strict prehospital criteria adhered to; only those at least risk associated with thrombolysis and anticipated to have greatest benefit were considered.
- Additional assessment on site did not increase the time taken to get patients to hospital.
- Paramedics can correctly identify those who might benefit from thrombolysis in the field without leading to delay in transportation to hospital. The question from this study to be followed up in a

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randomised, controlled trial (RCT) is whether the next step (PHT) can be carried out by paramedics.

Mortality and prehospital thrombolysis for acute myocardial infarction (Morrison et al., 2000; ref 344)

This meta-analysis included six trials (of which only one involved paramedics).

- All-cause hospital mortality among patients treated with PHT was decreased significantly compared with in-hospital thrombolysis.
- Estimated call-to-needle time was significantly reduced by PHT.
- However, thrombolytic techniques differed between the studies.
- The study concluded that PHT for acute myocardial infarction significantly reduces call-to-needle time and all-cause hospital mortality.

Prospective observational cohort study of time saved by prehospital thrombolysis for elevation myocardial infarction delivered by paramedics (Pedley et al., 2003; ref 358)

Cohort study of time saved by telemetry-assisted PHT by paramedics.

- This study compared three groups of patients: (1) PHT, rural patients; (2) hospital thrombolysis, rural patients; (3) hospital thrombolysis, urban patients.
- Telemetry-assisted PHT was the only model that met the National Service Delivery 60-minute time-to-treatment guideline: median call-to-needle time saving of 73 minutes for patients from rural areas and 28 minutes for patients from urban areas (both highly statistically significant).
- The findings have positive implications for the use of PHT, especially in areas where transit times are high.

Prehospital selection of patients for thrombolysis by paramedics (Pitt, 2002; ref 295)

This study was set up to examine the time at which paramedics would have thrombolysed (using guidelines from the Joint Royal College Ambulance Liaison Committee); this was recorded and compared with the patient's actual treatment at hospital.

- There was good agreement between paramedic and hospital thrombolysis decisions.
- PHT would have reduced the call-to-needle time on average by 41.2 minutes.
- The authors concluded that PHT by paramedics is feasible and safe.

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Local heroes: collaboration in improving care and access to early thrombolysis for patients in Avon (Claridge, 2003; ref 343)

This study was set up to examine electrocardiograph (ECG)-telemetry-supported PHT by paramedics; the time at which they would have thrombolysed was recorded (using guidelines from the Joint Royal College Ambulance Liaison Committee) and compared with patients' actual treatment at hospital.

- Paramedics agreed with hospitals in all (181) cases where the hospital did not thrombolysed; they only agreed in four of 21 cases where the hospital did thrombolysed.
- The differences were attributed to different hospital/Joint Royal College Ambulance Liaison Committee criteria for thrombolysis (11 cases), change in patient symptoms (four cases), incorrect ECG reading by paramedic (one case) and incomplete data (one case).
- It was concluded that PHT would have reduced the call-to-needle time on average by 37 minutes.

Computer assisted assessment and advice for 'non-serious' ambulance service callers: the potential impact on ambulance despatch (Dale, 2003; ref 345)

Telephone triage of emergency calls by paramedics (nurses also in study).

- Almost 10% of patients triaged as non-urgent subsequently required hospital admission, raising concerns about the safety of this intervention.
- Paramedics were more likely to request emergency ambulance despatch than nurses but in most comparisons the data for nurses and paramedics could not be separated.
- Findings suggested that telephone assessment can be used to identify patients who are less likely to require accident and emergency care or hospital admission.

Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: a controlled clinical trial (Gausche et al., 2000; ref 332)

This was a controlled clinical trial comparing the use of endotracheal intubation (ETI) compared to bag-valve-mask ventilation in children.

- There were no significant differences in survival or neurological outcome between paediatric ETI or bag-valve-mask ventilation in a rapid-transport urban emergency-medical-services system.
- ETI was not used successfully in all cases (73% ETI attempt rate and 57% success rate).
- There was a detrimental effect in two subgroups on survival, and in one subgroup on neurological outcome (ETI group), leading to

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the recommendation that ETI should not be used in the community.

3.2.6 Physiotherapy

Although there were many sources of information about ESP in physiotherapy, the majority with data were audits that did not attempt to follow rigorous methodological requirements for establishing effectiveness or efficacy. One RCT is noted below that has some methodological flaws. However, even with those flaws, it highlights findings that are arguably robust and focused on patient outcomes.

A randomised controlled trial. Shifting boundaries of doctors and physiotherapists in orthopaedic outpatient departments (Daker-White et al., 1999; ref 119)

Physiotherapists were compared with sub-consultant surgical staff.

- 481 patients were randomised to see either a physiotherapist or sub-consultant surgical staff in an orthopaedic outpatients clinic.
- Primary patient-centred measures included pain, functional disability and perceived handicap at follow up. Secondary measures included health status, psychological status, health-related quality of life, self efficacy and satisfaction with care.
- Patients seen by ESP physiotherapists had higher satisfaction than patients seen by sub-consultant surgeons.
- ESP physiotherapists generated lower initial direct hospital costs, as they were less likely to order radiographs and refer patients for orthopaedic surgery.
- The study concluded that orthopaedic physiotherapy specialists were as effective as post-Fellowship junior staff and clinical assistant orthopaedic surgeons in the initial assessment and management of new referrals to outpatient orthopaedic departments, and generated lower initial direct hospital costs.
- Some limitations of the study must be considered as the inclusion criteria differed for the two hospitals (patients thought likely to require surgery were included at one hospital, excluded at the other), there was no blinding and follow up was very short (5 months).

Three other studies in physiotherapy (and the two studies that included a focus on occupational therapy) comprised surveys exploring reasons for implementation of the ESP service, views of doctors working with ESPs, appropriateness of the ESP referrals to consultants and use of skills. These surveys showed that therapists had expanded their roles to increase their professional autonomy and skills (Hattam, 2002, ref 342; Ellis and Kersten, 2001, ref 337; Atkins, 2003, ref 329), although service demands were more frequently reported by medics as drivers for the development of these innovative roles (Ellis and Kersten, 2002, ref 331). Although the ESP services appeared to

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decrease waiting times (Hattam 2002) it was also reported that these could be would soon be filled up with other patients, as noted in two of the studies (Ellis and Kersten, 2002; Milligan, 2003, ref 330). In addition, therapists and medics reported concerns in terms of litigation, lack of confidence and fear of adverse reactions when using injection skills, variations in training and the notion that the ESP service is 'only as good as the therapist employed' (Atkins, 2003; Milligan, 2003; Ellis and Kersten, 2002). None of these surveys sought patients' views directly.

A qualitative master's dissertation concerning ESP therapist experiences in orthopaedics was located (Dawson, 2002, ref 399). This work is pending publication but in summary the key findings were that success and satisfaction in the post is dependent on the relationship with the consultant and the medical team and that most extended scope practitioners experienced similar difficulties and had similar outstanding training needs. Findings suggest that although the job can be very stressful it is also very satisfying. Whereas this was a small case-study design with four physiotherapists, it was methodologically robust and indicates some of the key issues that warrant further exploration in research.

3.2.7 Occupational therapy

The two studies exploring occupational therapists as ESP meeting our quality criteria explored the role of hand therapists in the UK (Ellis and Kersten, 2001, 2002; refs 337 and 331). As noted above, these studies explored both physiotherapists and occupational therapists roles and were more focused on the actual role than the individual discipline performing the role.

3.2.8 Speech and language therapy

A number of centres are currently involved in work evaluating ESP roles in speech and language therapy although that work is again largely descriptive and therefore included in the next section of this report. One paper, as yet unpublished, was acquired from the author and upon review was found to warrant consideration for data extraction.

Evaluating the effectiveness and efficiency of voice therapy using fiberoptic videolaryngeal endoscopy: a randomised controlled trial (Rattenbury et al., 2003; ref 340)

- An RCT in which patients were randomised into two groups: (1) received voice therapy using fiberoptic videolaryngeal endoscopy (VLE); (2) received traditional voice therapy. Several voice-related outcome measures were used (independent perceptual rating of voice quality, patient's report of own vocal performance, electroglottograph analysis).

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- The time taken to complete voice therapy was significantly shorter in the VLE-assisted group than in the traditional voice-therapy group.
- The authors concluded that VLE as a therapy tool is more efficient than traditional voice therapy.
- The reviewers felt some limitations of the study must be considered: the study was limited to a single geographic location, it had a lack of follow up and there were some concerns surrounding the statistical evaluation utilised.

Thus, research regarding ESP in each profession has been found that suggests AHP-ESP can be more effective than more standard interventions or services. However, methodological flaws were noted, and the focus has rarely been on patient health outcomes.

It is perhaps unsurprising that the distribution of studies among the professions is as described. Paramedic and radiographer interventions tended to be more discreet and specific, facilitating evaluation, whereas as for some professions ESP interventions appeared less easily defined and compared. In the case of occupational therapists, the profession itself and others have suggested that the nature of the profession is broad and based on concepts of 'wholism'. Thus, the concept of ESP has been perhaps less applicable (Howard, 2002, ref 355). Certainly, the associated professional body has only recently issued a policy statement about ESP (College of Occupational Therapists, 2003, ref 273). In the case of speech and language therapy, professional enhancement over the last few years has meant that even seemingly 'other profession' activities (e.g. the use of neuropsychological assessment tools for measuring aspects of cognition) are considered part of routine practice.

3.3 Descriptive findings regarding types of ESP in AHPs⁴

As noted at the beginning of this section, only 22 papers met inclusion criteria for data extraction (see Appendix 5). However, over 200 sources supporting ESP, but which are largely discursive or based upon single-site audits or service description, have been determined to date (December 2003). An additional 23 papers were located in the update to the report (May 2004); however, these papers did not alter the findings or the thrust of the report. A summary of the descriptive information is provided below, with all the papers that we identified listed in Appendix 6. Full dissemination of these findings is pending publication in peer-reviewed journals.

⁴ All papers for data extraction are listed in Appendix 6.

3.3.1 Type of information

The most frequent form of information considered was local audit ($n=64$ or 20% of the total). Some of these included a focus on patient and other professional perspectives of services (including satisfaction, general feedback) but few explored other patient outcomes. Twenty-five surveys of patient or therapist views were found. A further 29 reports and 25 service descriptions were found, most of which contained only descriptions of services as opposed to any analysis of effectiveness. There were ten non-systematic reviews which, although not included themselves, did point the way to original data that was included in data extraction. Of note, there were 79 point-of-view articles or letters to the editor discussing aspects of ESP, again containing little or no data, with a further 19 newspaper or magazine commentaries about ESP. Small numbers of other dissemination formats were found including editorials, educational papers and case reports.

There were two theoretical papers both about physiotherapy (Schleifer Taylor *et al.*, 1997, ref 48; Polmanteer, 1999, ref 350). The thesis that underpinned Polmanteer's work was not received prior to the completion of the study but will be considered for inclusion when the data are updated. Two further studies explored a qualitative approach to ESP, one of which was in radiography (Colyer, 2000, ref 313) and one in physiotherapy (Carr, 2002, ref 284).

3.3.2 Why is ESP research being done?

In reviewing the information sources, we explored whether specific drivers of ESP were recognised by the writers. In nearly 50% ($n=153$) no driver of ESP was noted explicitly, with the majority of those identifying a driver focusing on local or national service demands ($n= 113$, 30%) such as shortage of doctors or increasing waiting lists. Relatively few ($n=26$, 5%) stated improving patient outcomes or service quality explicitly and among the small numbers identifying other reasons, three suggested that ensuring patient and practitioner safety was important.

3.3.3 Who is doing ESP?

The majority of information about ESP collated concerned physiotherapists as shown in Table 3.2.

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Table 3.2 Sources used for descriptive information shown by profession

Professional group	Number of sources
Physiotherapy	144
Radiography	100
Paramedics	55
Speech and language therapy	11
Occupational therapy	10

The remainder of sources covered multiple professions or did not specify a professional group, addressing AHPs generally.

The majority of papers found ($n=241$) were describing initiatives in the UK with 74 from the USA and smaller numbers from other countries. Given that many of the UK papers were found through local sources, this should not be taken to mean that ESP is more common in the UK than the USA. However, comparatively few sources were found from other countries; for example Canada had five and Australia and New Zealand had two, with single numbers from Asia and Africa and some unspecified.

3.3.4 Type of information by profession

Across each group, there were many points of view or discussion papers. Audit was relatively frequent in physiotherapy ($n=47$), with a number of other service descriptions but with little data ($n=17$). In both radiography and paramedic practice, pragmatic trials and surveys were relatively common. In speech and language therapy, five of the sources were local audits with a number of points of view, individual case reports and position statements. Information sources in occupational therapy varied, with no one type occurring frequently.

3.3.5 Type of patients involved

Many of the sources failed to identify any particular patient group ($n=130$) and for many conditions there were relatively few references found (e.g. paediatrics, ophthalmology and neurology). The patient group with greatest representation is perhaps unsurprisingly those with musculoskeletal disorders ($n=99$), given the preponderance of physiotherapy audits regarding back pain and other orthopaedic conditions.

3.3.6 Type of ESP

The most frequent type of ESP reported included a form of non-invasive assessment of patients that was more traditionally carried out by medical colleagues. Table 3.3 summarises the number of each type of ESP where it was reported to be either definitely or possibly occurring (clearly some are multiple entries).

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Table 3.3 Types of ESP intervention

Type of intervention	Number reported	Example
Non-invasive assessment	213	Paramedics and prehospital: 12 lead ECG diagnostic strategies can be implemented successfully if attention is paid to protocol development, training, education, co-ordination of care community and objective programme assessment (Aufderheide <i>et al.</i> , 1996, ref 107).
Invasive assessment	55	Speech and language therapy role in stroboscoped laryngoscopy for voice production but not for diagnosis of laryngeal pathology (American Speech-Language-Hearing Association, 1998, ref 97).
Non-invasive treatment	126	This paper debates issues in AHP prescribing, in which the barriers/problems arising are discussed. A number of problems concerning AHP physio prescribing are elicited with comment that the driver must be improved patient care (Physiotherapy Frontline, 2002, ref 207).
Invasive treatment	79	Physiotherapists acting in the place of junior doctors and their ESP may include selecting their clinical referrals, requesting and interpreting investigations, forming a working diagnosis and planning patient management (giving steroid injections, discharging to community care) (Durrell, 1996, ref 45).
Direct access to therapist rather than consultant service	56	Physiotherapists forming part of the accident and emergency triage team seeing patients as emergencies (Oliveck, 2000, ref 72).

3.3.7 Perspective on ESP

While these papers cannot necessarily be relied upon for evidence of the impact of ESP, they do provide a sense of where the professions are with new roles such as ESP. Table 3.4 provides a summary of the perspectives that appeared to be demonstrated within the literature, with an accompanying example for each.

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Table 3.4 Summary of perspectives on ESP found in the literature

Overall perspective	Number reported	Example
A Evidence in support of ESP (but with limits to that evidence)	32	<p>Radiographers appeared very able to report verification films once training was provided; shift of responsibility and workload not perceived to be problematic.</p> <p>Positive and negative predictive values between therapeutic radiography and medical reporting (the latter being the gold standard) were reported to be high: 99 and 92%, respectively. However, lack of 'blinding' may have influenced results (Suter <i>et al.</i>, 2000, ref 317).</p>
B Largely descriptive/discursive; supportive of ESP	221	<p>Mainly exploring specialist occupational therapies and much of this is not ESP; however, the paper highlights two specific factors of interest to ESP:</p> <p>a) given a holistic approach the interest in occupational therapy ESP is almost endemic;</p> <p>b) some roles (e.g. oral motor skills training) are not core to UK occupational therapies but are in the USA (Howard, 2002, ref 355).</p> <p>Summary of developments in consultant roles including the concern regarding the Department of Health statement in its Advance letter that the post was not to be used for recognising innovative practice. This may have implications for ESPs (Price <i>et al.</i>, 2002, ref 138).</p>
C Evidence that ESP should not be supported (with some methodological problems in that evidence)	1	<p>ESP in emergency services can endanger patients: treatment and diagnosis skills for large numbers of patients with infections shown to be problematic, although the study is flawed. Recommended that planners ensure that any introductions of ESP in such services don't reduce public-health benefits (Bissell <i>et al.</i>, 1999, ref 86).</p>
D Largely descriptive/discursive; with concerns or not supportive of ESP	10	<p>Review of thrombolysis treatment reporting on whether it is of benefit to patients. The discussion includes a focus on the potential benefit in rural areas if paramedics or nurses were able to deliver the intervention. However, concerns are raised about unresolved issues regarding the level of education required for safe practice and the potential legal implications for AHPs (Carlsson <i>et al.</i>, 1997, ref 326).</p>
E Largely descriptive/discursive; with mixed perspective	69	<p>Interview study examining the impact of technological advances on radiography skill mix. Radiologists believed radiographers should acquire a higher level of knowledge in anatomy to expand their role. Radiographers said pattern-recognition ESP was particularly advanced in barium studies and contrast injections and respondents felt ultrasound would expand further. Concerns: adequate training and quality</p>

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assessment required; prioritise continuing professional development rather than pre-registration training; radiographers taking on too many jobs could sense unreasonable expectations by managers rather than opportunities for role development (Price *et al.*, 2000, ref 376).

The number of sources in favour of ESP developments far outnumber those that express negative findings or concerns. In particular, there are over 200 sources that are supportive of ESP while being largely descriptive or discursive (i.e. not research utilising robust qualitative or quantitative methods). Whereas this positive outlook may be expected given that people are perhaps more likely to write up positive than negative findings (a well-recognised aspect of publication bias), some concerns were also raised, as noted above. Such issues are explored further in the discussion (Section 4).

Section 4 Discussion

4.1 Introduction

The review has highlighted that despite major interest in developing ESP roles, and many pragmatic efforts exploring its impact, little robust evidence is yet to hand. The strongest evidence is that health professionals can indeed learn specific advanced skills, outside their routine scope of practice, and apply them in the clinical setting. However, many unanswered questions regarding the opportunity costs of such service developments remain in relation to a more comprehensive understanding of outcomes for patients, the health professions and indeed the NHS. It would appear that in order for investment in the most appropriate services to be targeted, further research is essential.

From the descriptive information collated, it is clear that many new extended scope roles are being developed and examples of that activity are provided in Section 3 of this report. A number of important issues regarding ESP exist across the professional groups studied and, despite some differences, the similarities are noteworthy. It may therefore be that exploring ways forward for one profession provides benefit and a way forward for others. To that end, the co-ordinating efforts of the CWP are encouraging. The following discussion attempts to tease out these issues so that clarification of the best way forward can be obtained.

Discussion of these issues occurs within the context of the research done, associated literature and indeed feedback from the many practitioners we have talked with in the process of carrying out this research. The primary reason for contacting individuals was to locate data sources, but in such contacts views about ESP were often expressed. Clearly these discussions were not recorded or analysed systematically and are reflected on rather than suggested as evidence.

4.2 Issues arising across the AHP groups studied

4.2.1 Variability in terminology around ESP

The search terminology in our research was necessarily complex due to the variable nature of descriptions and discussions across individual professions and in different sources of information. We suggested early on in this report that the term ESP may itself be problematic. In particular, it becomes difficult to be certain when an ESP role is no longer ESP and as such the title can cause confusion. To that end continuity of language use would be advantageous. A range of terms are used within specialist practice that may or may not include

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extensions of scope, including consultant practitioner, specialist practitioner, practitioner with special interests and clinical specialists, such as orthopaedic practitioner and rheumatology practitioner. With the introduction of The Ten Key Roles for AHPs,⁵ and attempts to reach a consensus about directions for practice, it may be timely that specific emphasis is invested in identifying a language more easily interpreted and shared within and across professions. By doing so, knowledge in the field is more likely to be advanced.

4.2.2 Difficulties with including evaluation in clinically based extended scope projects

Many of the papers considered were restricted to inclusion in the descriptive component of the review due to failure to include data or limitations in methodological rigour. Concerns about improving the credibility of AHP-ESP research were expressed across each of the professional groupings considered in both publications, but perhaps more noticeably in discussion with clinicians and others involved in ESP in the course of accessing information. Although keen to include evaluation, concerns were raised about:

- the lack of dedicated time and funding for evaluation;
- the complexity of research governance procedures in clinical practice;
- the time required for ethical review – indeed, this was a problem specifically mentioned by the CWP as this prevented them from evaluating patients' perspectives on new services fully;
- the notion that other therapists in the country might not be interested in local service developments;⁶
- the lack of research skills.

Each of these issues was identified as a barrier to be surmounted but assistance to overcome them was said to be required. Given the informal nature of much of this feedback (although augmented by a number of data sources reported in the descriptive component of the review) caution in drawing conclusions is essential. However, it would be useful to address questions about the barriers to researching and evaluating ESP in future research.

4.2.3 Variability in training and education for ESP

Across each professional group, great variability was observed in how the training/education of the practitioner occurred. The dominant model appeared to be a fairly *ad hoc* approach to training with ESP practitioners dependent on an enthusiastic consultant or academic for

⁵ <http://www.doh.gov.uk/chpo/ten-key-roles-ahp.pdf>

⁶ Phil Gray, Chief Executive Chartered Society of Physiotherapy at the New Roles for Allied Health Professionals Conference, London, November 2003.

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training. While such education and training may be sufficient to enable the practitioner to learn a specific skill, there are clearly questions about standardisation of quality for patients as well as regulation and protection for the practitioner

An early example of steps to establish core competencies for extended practice can be seen in the case of radiographers and image reporting. Recognising the need for a deeper level of knowledge in order to practise some of the extended skills that may previously have been taught while on the job, the professional body requires radiographers to attain a recognised postgraduate qualification. It also appears that modules at MSc level that specifically address ESP are being introduced for the other professions (e.g. University of Southampton Masters module in ESP, commenced January 2004).

Another professional group attempting to enhance education for extended scope practitioners is paramedics. Indeed the recently formed professional body has been among those who have proposed a fundamental move from 'training' to 'education' for all paramedics. Such a view is based upon the suggestion that advanced skills of diagnosis, screening and assessment are required if advanced techniques are to be used in a timely and safe manner (Bissell *et al.*, 1999, ref 86; Newton, 2003, ref 351; Wallis *et al.*, 2003, ref 314).

It is important to ensure educational standards that patients and practitioners can feel secure in. While practitioners frequently pursue their own postgraduate training at masters level or clinical doctorate programmes, the variability in education and training for ESP remains an issue requiring attention.

4.2.4 Competence and legality of practice

Extended scope practitioners are legally covered for their ESP practice by their employing Trust (and not by their professional body), provided they carry out tasks delegated to them by other staff (usually medics, but not necessarily) who deem the extended scope practitioner competent (see for example The Chartered Society of Physiotherapy, ref 141). However, concerns regarding the legal issues of ESP practice were mentioned fairly frequently in documentation reviewed and by practitioners when discussing the project with them. In addition, competency is not always assessed formally (perhaps with the exception of the radiographers and paramedics undergoing training to read films and use PHT). It may be that, with the increased experience of introducing AHP-ESP that has been initiated and supported by the CWP, such concerns will be alleviated. Resources available to local practitioners and services have grown enormously over the past 12 months and a higher profile to these resources is now available at the CWP website:
www.modern.nhs.uk/cwp/roleredesign.htm.

The main responsibility for ensuring competence of practitioners, currently rests with individual professional bodies and each

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professional body we were able to make contact with has produced position statements regarding that competence. In addition to this, the Health Professions Council, although not giving advice on scopes of practice *per se*, have produced two documents that have relevance to registered practitioners. These are *The Standards of Performance and Conduct & Ethics* and *the Standards of Proficiency*, each of which can be downloaded from the Health Professions Council website, www.hpc-uk.org. However, it is interesting to consider that some aspects of extended scope will by definition lie beyond the remits of individual professions and as such would perhaps benefit from the input of an extra professional body.

4.3 Updating the review

Data searching continued at regular intervals until 19 December 2003. In pursuing these searches, a further selection of data sources was discovered and these papers have now been reviewed and listed in the Appendices. We note that the additional material did not change the thrust of the review nor its conclusions.

Section 5 Conclusions

5.1 Introduction

The review has found that despite the introduction of extended scope roles across all of the professional groupings considered, evidence about the impact of these new roles is limited. To date, the main focus on outcome has been largely concerned with imperatives such as reduced demand on medical colleagues and reduced waiting lists. Evidence from the studies considered in this review has suggested that AHP-ESP interventions can indeed contribute to improved ease and speed of access to specialist services that can be provided. An increasing number of studies, particularly in radiography and paramedic practice, have suggested that improved access to specialist interventions does lead to improved patient outcomes (such as reduced call-to-needle times in thrombolysis).

However, we would suggest that an increased focus on health outcomes for patients is required. Despite being identified as important by practitioners and researchers, such outcomes have been evaluated infrequently to date. In addition, consideration of less immediately obvious NHS outcomes (such as the impact on routine services having lost experienced AHPs to ESP roles) is required. With the introduction of The Ten Key Roles for AHPs and the increased activity of the CWP, it appears both timely and opportune that there is a higher profile to focused evaluation and strengthened evidence of AHP-ESP practice. Such evaluation is vital if we are to concentrate our efforts and expenditure in a way that is most beneficial for our patients. The Agenda for Change (National Health Service Modernisation Agency, 2004) brings with it an increased focus on role development and we would suggest that specific and robust investigation is required urgently if we are to ensure evidence-based policy around ESP.

It is perhaps salutary to note the words of George Silver, Deputy Assistant Secretary for Health and Scientific Affairs in the 1960s, who when invited to consider the issues of workforce and manpower shortage in the USA said:

it appals me that scientific workers, accustomed to the most rigorous application of statistical and epidemiological principles in their particular craft, toss these tools aside and adopt the rapt principles of faith and dogma in their place.... The manpower shortage in the health field is a social event that has an historic basis and a contemporary series of causes ... without understanding and accepting these facts, nothing can be done about dealing with the shortage....

Silver (1966)

Whereas ESP may provide part of the solution to current workforce pressures, Silver's words provide food for thought concerning how we are confronting those challenges. Partnership between health-care practitioners, academics, funders and policy-makers in the application

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of appropriate qualitative and quantitative evaluation is essential if we are to develop roles that most benefit patients and the NHS.

5.2 Specific implications and recommendations

- Evidence suggests that AHPs are able to perform a range of advanced practices that have been undertaken traditionally by medical practitioners.
- Pragmatic local evaluations should be incorporated when introducing role development.
- Despite the contribution of local evaluations, robust trials comparing ESP interventions and 'routine' management are required urgently.
- Further evidence about the impact of ESP on patient outcomes (such as health, reduced disability, improved quality of life) is required.
- Cost-effectiveness trials considering comprehensive costings, including hidden costs, are required.
- A consensus regarding a common language for ESP would be advantageous.
- Further investigation of ESP views about barriers to extending practice should be sought.
- Further investigation on how best to prepare and support those in ESP roles is required.
- Further development of AHP awareness and skills of research and the evaluation of treatments or interventions is required.
- Moves towards more co-ordinated training and education of ESP AHPs should be investigated with a view to standardisation of high-quality care while allowing for local differences in service requirements.

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Appendices

Appendix 1 Search strategy

Appendix 1a Search strategy

Medical subject heading (MeSH) terms are in italics.

M, Medline; C, CINAHL; A, Ahmed; E, Embase; exp, explode.

Intervention

Advanc* practi*

consultant therapist*

Cross Boundar*

Current role*

Enhan* practice* – enhan(ced/cing/sion(s)) practice(s)

Enhan* scope* – enhanc(ed/ing/ement(s)) scope(s)

Existing role*

Existing scope*

Exp* practice* – expan(ded/ding/sion(s)) practice(s)

Expan* scope* – expan(ed/ing/sion(s)) scope(s)

Ext* scope* – extra/exten(ded/ding/sion(s)) scope(s)

Exten* practice* – exten(ded/ding/sion(s)) practice(s)

int??disciplinary competenc* – (intra/inter)disciplinary c.

int??disciplinary practice* – (intra/inter)disciplinary p.

interdisciplinary collaboration

Joint practice*

Multi* task*

New role*

New scope*

physician exten*

physician* assist*

Profession* boundar*

Reprofessionalization

role change^c

role* boundar*

role* chang* – role(s) chang(ed/es/ing)

role* collaborati* – role(s) collaborati(ve/on)

role* cross* – role(s) cross(ing/over(s))

role* defin* – role(s) defin(e/ed/ing/ition(s))

Extended Roles for Allied Health Professionals

role* demarcation*

role* enhan* – role(s) enhanc(ed/ing/ement(s))

role* expan* – role(s) expan(ded/ding/sion(s))

role* exten* – role(s) exten(ded/ding/sion(s))

role* interdisciplin* – role(s) interdisciplin(e/ary)

role* interprofessional*

role* modern* – role(s) modern(ise(d)/ising/isation)

role* overlap* – role(s) overlap(s/ped/ping)

role* professional*

role professional^M*

role* redefin* – role(s) redefin(e/ed/ing/ition(s))

role* shar* – role(s) shar(ed/es/ing)

role* shift* – role(s) shift(s/ed/ing)

scope of practice

scope of practice^C (exp, not scope of nursing practice)

Shar* Competenc* – shar(ed/ing) competenc(e/y/ies)

Shift* boundar*

Skill* interdisciplin*

Skill* overlap* – skill(s) overlap(s/ped/ping)

Skill* shar*

Specialist practitioner*

Traditional role*

Transdisciplinary practice*

Populations

exercise therap* – exercis(e) therap(y/ies/ist(s)) (+)

exercise therapy^{A, M(exp)}

kinesiotherap* – kinesiotherap(y/ist(s)) (+)

kinesiotherapy^{E(exp)}

manual therap*

manual therapy^{C(exp)}

physiotherapy

physical therap* – physical therap(y/ist(s)/ies) (+)

physical therapists^C

physical therapy^{C(exp)}

physical therapy speciality^M

physio

physios

physiotherap* – physiotherap(y/ist(s)) (+)

physiotherapist^E

physiotherapy^{A, E(exp)}

Extended Roles for Allied Health Professionals

ergotherap* – ergotherap(y/ist(s)) (+)
occupational therap* – occupational therap(y/ies/ist(s)) (+)
occupational therapist^E
occupational therapists^{A, C}
occupational therapy assistants^C
Occupational therapy^{M, A, C(exp), E}
recreational therap*
recreational therapists^C

audiologists^C
audiolog* – audiolog(y/ist(s)/ical) (+)
audiology^{M, C, E}
auditory rehabilitation
auditory rehabilitation^E
Language therap* – language therap(y/ies/ist(s)/eutic(s)) (+)
language therapy^{M, A, C}
logopaed* – logopaed(y/ist(s)) (+)
rehabilitation of speech and language disorders
rehabilitation of speech and language disorders^{M(exp)}
rehabilitation, speech and language^{C(exp)}
speech and language
speech and language^E
speech and language pathologist* – s. and l. pathologist(s) (+)
speech and language rehabilitation
speech language pathologist* – s. l. pathologist(s) (+)
speech language pathologists^C
Speech language therap* – s. l. therap(y/ies/ist(s)/eutic(s)) (+)
Speech Patholog* – S. pathology, S. pathologist(s), S. L. pathology, S.
L. pathologist(s), S. L.-voice pathology, S.L.V.-pathologist(s),
S.L.P. (+), S. and L.P(s)
speech rehabilitation
speech rehabilitation^{E(exp)}
speech therap* – speech therap(y/ies/ist(s)/eutic(s)) (+)
speech therapy^{M, A, C, E}
Speech train* – Speech train(ed/er(s)/ing) (+)

nuclear medicine – nuclear medicine (+)
nuclear medicine^{M(exp), C, E}
nuclear medicine technicians^C
radiographer* – radiographer(s) (+)

Extended Roles for Allied Health Professionals

radiography^{A(exp), C(exp), E(exp), M(exp, not extravasation of diagnostic and therapeutic materials, contrast-media)}

radiography – radiography (+)

radiologic technologists^C

radiologic* technician* – radiologic(al) technician(s)

radiologic* technologist* – radiologic(al) technologist(s)

radiology personnel

radiology personnel^F

technology radiologic

technology-radiologic^M

Air ambulance* – Air ambulance(s) (+)

ambulance paramedic* – A. paramedic(s)

Ambulance personnel

ambulance staff* – ambulance staff(ing) (+)

Ambulance technician* – A. technician(s)

crisis intervention

crisis-intervention^{M, C, E}

critical care

critical care^{M, A, C}

d?spatch* – d?spatch(es)

emergenc* medic* – emergenc(y/ies) medic(s/al/ine) (+)

emergency care

emergency care^{C(exp)}

emergency health – E. H. service, E.H. personnel, etc.

emergency health service^E

Emergency medical services^{M, A, C(exp)}

Emergency medical Technicians^{M, C}

Emergency Medicine^{M, C, E}

emergency personnel

emergency service^{C(exp)}

emergency service* – E. service(s) (+)

Emergency service, Hospital^M

Emergency services, psychiatric^M

Emergency treatment^{M, A, C, E(exp)}

emergency treatment* – E. treatment(s) (+)

First aid^{M, A, C, E}

first aid* – First aid(er(s))

paramedic* – Paramedic(s/al/ine) (+)

paramedical personnel^F

paramedical profession^F

Extended Roles for Allied Health Professionals

priority dispatch – Priority dispatch(es) (+)

rapid response* – rapid response(s) (+)

resuscitation

Resuscitation^{M, A, C(exp), E}

urgent transport* – u. transport(ing/ation)

Population (generic-profession terms)

allied health – allied health (+) (includes education, personnel, profession(s), professional(s), staff(s), occupation(s), etc.)

Allied health^A

Allied health occupations^M

Allied health personnel^{M, A, C}

allied health professions^C

Generic therapist* – generic therapist(s) (+)

health manpower

Health Manpower^M

Health occupation* – Health occupation(s)

health occupations^M

Health personnel

Health personnel^{A, M}

Healthcare personnel

Multiprofessional* – multiprofesional(s)

Profession* allied to health – profession(s), professional(s) allied to health, allied health profession(s), professional(s)

Profession* allied to medicine – profession(s), professional(s), allied to medicine

rehabilitati* – rehabilitation, rehabilitative, (+) (includes therap*, treatment*, personnel, assistant, professional*, etc.)

rehabilitation^{M(exp), A(exp, not rehabilitation nursing), C(exp, not define string here), E(exp, not define string here)}

specialities, allied health^C

Appendix 1b Brief search strategy

Interventions	Populations
1 Exten* scope* 2 New role* 3 Enhan* scope* 4 Role enhanc* 5 Role redefin* 6 Expan* scope* 7 New ways of working 8 Exten* practice 9 New scope* 10 Expan* role* 11 Exten* role* 12 Role shift*	A <i>Physiotherapy</i> 1 Physiotherap* 2 Physical therap* 3 Manual therap* 4 Exercise therap* B <i>Occupational therapy</i> 1 Occupational therap* 2 Recreational therap* C <i>Speech and language therapy</i> 1 Speech and language 2 Speech therap* 3 Language therap*
Search procedure 1 Check whether wildcard (*) is appropriate; adjust if required. 2 Combine interventions and populations to form a search strategy as follows: (intervention 1 or 2 or 3...) and (population 1 or 2 or 3). 3 If possible, search using all the listed terms. However, if the type of database and/or number of returned results precludes searching all interventions and populations, apply terms in priority order (1=highest priority).	D <i>Radiography</i> 1 Radiographer*
	E <i>Paramedicine</i> 1 Paramedic*
	F <i>Professions, generic</i> 1 Allied Health prof* 2 AHP

Appendix 2 Study eligibility and evaluation

2a Abstract-screening form

Ref ID	First author	Date
--------	--------------	------

Abstract Screening Criteria

	Yes	No	Can't tell
<i>Tick most appropriate box</i>			
1. Is the paper relevant to ESP in the six AHPs in either: a) evaluating outcomes for patients/other staff/ NHS or b) describing an example or model of ESP or c) describing perceptions or developments in relevant ESP	Submit to folder A	Go to 2	Submit to folder B
2. Does the paper provide other information on ESP that could be useful to a) the conduct of the review or b) contextual factors or c) our recommendations?	Submit to folder C1	Go to 3	
3. Does the paper provide information on a related area of practice such as education, teamwork, collaboration, role definition, role satisfaction, etc?	Submit to folder C2	Submit to folder D	

Allied health professions covered

	A, B or C
Physiotherapy (PROF-PHY)	<input type="checkbox"/>
Occupational therapy (PROF-OT)	<input type="checkbox"/>
Speech and language therapy (PROF-SLT)	<input type="checkbox"/>
Pharmacy (PROF-PHA)	<input type="checkbox"/>
Paramedic (PROF-PAR)	<input type="checkbox"/>
Radiography (PROF-RAD)	<input type="checkbox"/>
Other relevant (e.g. radiology, pharmacology) (PROF-OTH)	<input type="checkbox"/>
None relevant (PROF-NOT)	<input type="checkbox"/>
Can't tell (PROF-UNK)	<input type="checkbox"/>

Content

Outcome (OC)	<input type="checkbox"/>
Not outcome (NO)	<input type="checkbox"/>

Reason for choice of folder A / B / C / D

Additional keywords to be added to RefMan

For folder C1 choose from box 2 or own word

For folder C2 choose from box 3 or own word

(not added as a search terms for future search strategy unless (For SS) added after the term)

Action/interpretation

Folder A Relevant abstracts (for critical appraisal)

Abstracts for which the full original research reports should be obtained for further critical appraisal.

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Folder B Potentially relevant (may be relevant for appraisal – review after accessing)

Abstracts not to be discarded yet because their relevance is uncertain (e.g. translation required, abstract lacks clarity, too brief or missing altogether or unclear whether professional role constitutes normal or extended scope. Go to 1 then attach the updated abstract-screening record here.

Folder C1 Useful-context abstracts (may need to be acquired – but not for critical appraisal)

Full, original, research reports may be required, depending upon the extent of information given in the abstract. May include papers considering ESP in other professions, or other documents of use to the review.

Folder C2 Related-area abstracts (may need to be acquired – but not for critical appraisal)

Papers not related to the review topic, but cover areas of some interest and may be of value in future research.

Folder D Irrelevant abstracts (trash can)

Papers that are not relevant – consider C2 before discarding.

2b Generic methodological screening form

The generic form is shown (based on CASP and Health Evidence Bulletin). Other forms were used where possible and appropriate (e.g. for RCT evaluation, systematic review and audit).

GENERIC EXTEND Project critical appraisal assessment

Authors and year	Ref ID
Title	
Type of study design	

1 Purpose of the study

1a Were the following stated?	Yes	Not clearly	No	Not relevant
Aims of the work				
Populations (or cases)				
Interventions				
Comparison interventions (if relevant)				
Outcomes				

1b Study summary

(minimum description: use brief bullet points or single words)

Purpose of study		
Populations a professions involved b other population(s) (e.g. patient, health worker, public)		
Interventions a in the ESP or experimental population group(s) b in other population group(s) (e.g. control)		
Outcomes investigated		
1c Study type (quantitative, qualitative, mixed)	Yes	No
Is there any quantitative presentation of results or analysis of data (includes mixed-design studies)?	<input type="checkbox"/> Go to 2	<input type="checkbox"/> Go to 3

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2 Quantitative studies

2a Design of quantitative studies

	Yes	Not all/can't tell	*No
Was the study design suitable for quantitative analysis of the results? (i.e. with adequate replication and randomisation where appropriate)			
Were study and reference groups similar at the outset?			
Were the subjects (patients, health workers) 'blind' to which intervention they received? (see Note 1)			
Apart from the experimental intervention(s), were the study groups treated equally during the study?			

*If no, state the reason in the box under Section 4b.

2b Summary statistics indicating the size of an effect (see Note 2 for calculations)

	Given in paper	Can be calculated	If used – was this appropriate? Yes/no
Mean difference			
t-test or non-parametric test of difference			
Absolute risk reduction (ARR)			
Control event rate (CER)			
Experimental event rate (EER)			
Number needed to treat (NNT)			
Odds ratio (OR)			
Relative risk (RR)			
Relative risk reduction (RRR)			

2c Other statistics employed (e.g. correlation, regression)

	*Test appears appropriate for the data and question	*Unclear whether this test is appropriate	*Test is clearly not appropriate as used here
Type of test and the test statistics given (specify)			

* Tick box and, if appropriate, state the reason in the box.

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2d Precision of treatment effect estimates	Given in paper	Can be calculated	Not given
Sample size			
Statistical power			
Confidence intervals/limits			
<i>P</i> values			
Standard error			

3 Qualitative or mixed-design studies

3a Study type (quantitative, qualitative, mixed)

	Yes	No
Is there any qualitative presentation of results or analysis of data (includes mixed-design studies)?	<input type="checkbox"/> Go to 3b	<input type="checkbox"/> Go to 4

3b Design of qualitative studies

	Yes	Can't tell	*No
<p>1 Is the choice of a qualitative method appropriate?</p> <ul style="list-style-type: none"> What was this study exploring (e.g. behaviour/reasoning/beliefs)? Do you think a quantitative approach could have equally/better addressed this issue? 			
<p>2 Was the author's position clearly stated?</p> <ul style="list-style-type: none"> Has the researcher described his/her perspective? Has the researcher examined his/her role, potential bias and influence? 			
<p>3 Was the sampling strategy clearly described and justified?</p> <p>Check to see whether</p> <ul style="list-style-type: none"> the method of sampling is stated or described the investigators sampled the most useful or productive range of individuals and settings relevant to their question the characteristics of those included in the study are defined (and are comparable to the wider population) 			
<p>4 Was there an adequate description of the method of data collection given?</p> <ul style="list-style-type: none"> Is the method of data collection described and justified? How were the data collected (e.g. audiotape/videotape/field notes)? If interviews were used, were the questions pre-tested? If observation was used, is the context described and were observations made in a variety of circumstances? 			
<p>5 Were the procedures for data analysis/interpretation described and justified?</p>			

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Check to see whether <ul style="list-style-type: none"> • a description is given of how the themes and concepts were identified in the data • the analysis was performed by more than one researcher • negative/discrepant results were taken into account • the data were fed back to the participants for comment 			
---	--	--	--

Source: *Health Evidence Bulletins – Wales* (<http://hebw.uwcm.ac.uk>)

*If no, state the reason in the box under Section 4b.

4 Generic methods quality appraisal criteria

4a Follow up of studies (see Note 3)	Yes	Can't tell	No	Not relevant
Was the duration of follow up appropriate for the intervention?				
Were all subjects that entered the study accounted for at its conclusion?				

4b Methods: general	Yes	Can't tell	*No
Overall, are the research design and other methodological aspects sufficiently clear and have adequate steps been taken to avoid bias?			

*If no, tick here and specify details in the box below.

Additional information on the methodology, noting any particular implications for interpretation of the study findings
--

5 Relevance (external validity) of the results

5a Wider applicability of the findings	Yes	Not all/can't tell	*No
After reading the article, are the results still clearly relevant to current ESP in UK AHPs?			

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Are the conclusions relevant to current ESP in UK AHPs?			
Are the conclusions logically supported by the results?			
Have all relevant outcomes been considered (e.g. implications for other groups of patients, health workers or the public)?			
Was the assessment of pros and cons (costs and benefits) impartial?			
Were adequate steps taken to prevent any bias (e.g. randomisation, blinding or publication bias)?			
Have all possible limitations of the study been considered (e.g. geographical, population or methodological restrictions)?			

*For a choice of no, where appropriate state reason in box below.

5b Statement of the principal bottom-line results of appraisal (concise bullet points)

Notes

1 Blinding Note that 'blinding' is not always possible so consider whether every (or any) effort was made to achieve the "potential degree of blindness" and, if blinding did not occur, whether this matters in this case. The key question here is whether blinding would have been adequate to avoid observer bias.

2 Calculation of summary statistics

	Outcome event		Total
	Yes	No	
Experimental group	a	b	a+b
Control group	c	d	c+d

Experimental event rate (EER)=risk of outcome event in experimental group= $\mathbf{a/(a+b)}$

Control event rate (CER)=risk of outcome event in control group
= $\mathbf{c/(c+d)}$

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Relative risk (RR) = EER/CER

Odds ratio (OR) = ad/bc

Relative risk reduction (RRR) = $(CER - EER)/CER$ or $(1 - EER)$

Absolute risk reduction (ARR) = $(CER - EER)$

3 Follow up Differences in the way groups of participants were reviewed during follow up may introduce performance bias; consider whether all groups were reviewed at the same time intervals and received the same amount of attention from researchers.

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2c Quality-screening summary form

Paper-screening form (PSF) Ref ID_____ 1st rev (initials)_____

2nd review for: Study team/SG/VL/AB/BE/not required 2nd rev (initials)_____

A Inclusion/exclusion criteria

A1 Population	Yes	No	Action
Does the paper concern one or more of the six AHP groups discussed? (PT, OT, SALT, PAR, RAR, pharmacy)	<input type="checkbox"/>	<input type="checkbox"/>	If no, regrade folder, <input type="checkbox"/> then only complete section B
A2 Intervention¹	Yes	No	If none yes, regrade folder, then only complete section B <input type="checkbox"/>
a Does the paper concern role enhancement (new skill/action)?	<input type="checkbox"/>	<input type="checkbox"/>	
b Does the paper concern role substitution (taking role of another)?	<input type="checkbox"/>	<input type="checkbox"/>	
c Does the paper concern some other form of ESP (neither a or b)? ²	<input type="checkbox"/>	<input type="checkbox"/>	
A3 Outcome (includes satisfaction and perception of role)	Yes	No	If none yes' mark for 'descriptive info only', and complete sections B and E
Does the paper address the impact of ESP on	<input type="checkbox"/>	<input type="checkbox"/>	
a patients?	<input type="checkbox"/>	<input type="checkbox"/>	
b the profession concerned?	<input type="checkbox"/>	<input type="checkbox"/>	
c other professions?	<input type="checkbox"/>	<input type="checkbox"/>	
d the NHS?	<input type="checkbox"/>	<input type="checkbox"/>	
A4 Does the paper report any data? (either qualitative or quantitative)	<input type="checkbox"/>	<input type="checkbox"/>	If no mark for 'descriptive info only' and complete sections B and E

¹ If you cannot assess whether this is ESP or not, please discuss with another researcher.

² Do not choose this unless A2a or A2b are inappropriate.

B Additional references

Are additional references to be obtained from this article's reference list? (any title that could elicit a yes answer to A1, A2 or A3)	Yes	No	Action
	<input type="checkbox"/>	<input type="checkbox"/>	If yes, please highlight references within the reference list of paper

C Checklist selection

If paper meets inclusion criteria complete quality-screening form (QSF) (e.g. generic/RCT/audit form). If more than one method is used complete most appropriate QSF and if necessary supplement with generic QSF.

- 1 Systematic review
 - 2 RCT
 - 3 Audit
 - 4 Other Cohort , case control , cross-sectional , case report/study , economic evaluation , qualitative research (e.g. incl. interviews, focus groups) , non-systematic synthesis (e.g. non-systematic review, editorial, opinion) , none of the above _____
- _____ (suggest name)

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D Quality summary³

Using completed quality checklist please summarise findings below and append completed checklist to this summary sheet.

Criteria	Yes	No
Are the aims and objectives of the research or report clearly stated?		
Is the research design clearly specified <i>and</i> appropriate for the aims and objectives of the research?		
Do the authors provide a clear account of the process by which their findings were produced?		
Do the authors display enough data to support their interpretations and conclusions?		

E: Action to result from quality screening

	Yes	No (or N/A)	Unclear
E1 Appropriate methods?	<input type="checkbox"/> Go to E2	<input type="checkbox"/> Descriptive information only ⁴	<input type="checkbox"/> Contact authors, re-check
E2 Adequate data quality?	<input type="checkbox"/> Quantitative data extract and/or <input type="checkbox"/> qualitative data extract	<input type="checkbox"/> Descriptive information only ⁴	<input type="checkbox"/> Contact authors, re-check

³ Based on National Electronic Library of Health and Hawker *et al.* (2002), Appendix C, without reliance on scores.

⁴ Please complete descriptive information-extraction sheet (DIES; Appendix 2d); second review not required (indicate at top of paper-screening form).

PT, physiotherapy; OT, occupational therapy; SALT, speech and language therapy; PAR, paramedic; RAD, radiography.

2d Descriptive information-evaluation sheet

Descriptive information extraction sheet (DIES) v.4

Ref Id _____

Please complete each box

Type of study/document	e.g. audit, letter	
Patient/Client population	Primary condition – system related (e.g. musculoskeletal, neuro, not specified, nil)	
	ESP intervention (e.g. film reporting, triage, post-surgery follow up)	
	Age group (e.g. child, adult, older person, mixed)	
Professional group	Primary profession delivering ESP	PT OT SALT PAR RAD (<i>circle</i>)
	Other professions delivering ESP	PT OT SALT PAR RAD Other (<i>circle</i>)
	Other professions affected	
Location of ESP	Geographical location	UK Other European country USA Canada Southeast Asia Australia (<i>circle</i>)
	Setting	Hospital Acute Trust Community PCT Other Can't tell (<i>circle</i>)
	Specific location (e.g. A&E/social service/school/army/prison/other /can't tell)	
ESP drivers (<i>mark as main, subsidiary 1, subsidiary 2, etc.</i>)	Improved patient outcomes Local service demand (e.g. waiting times) National service demand Patient demand Nil identified (<i>circle</i>)	
Bottom line 1	Brief description of main point of the publication	
Bottom line 2	Overall perspective on ESP a Evidence to support ESP provided b Largely descriptive – ESP supported by author c Evidence not in support of ESP provided d Largely descriptive – ESP not	(<i>circle and comment if necessary</i>) A B C D

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	supported by author e Largely descriptive – ESP partially supported by author but also some concerns expressed	E
Linked papers	Number codes for any linked papers	

PT, physiotherapy; OT, occupational therapy; SALT, speech and language therapy; PAR, paramedic; RAD, radiography.

Appendix 3 Data-extraction database

Front page menu

Each button noted below then links to a page for data entry on a specific issue.

The screenshot shows a software window titled "Menu" with a light blue background. At the top, it says "References already scored". Below this, there are input fields for "ESP Ref ID" (containing "1") and "RefManagerID" (containing "88"), with a "Score new reference" button to the right. A central panel displays "RefManID: 88" and "RefType: JOUR", followed by "Ref Details:" and a text area containing a citation: "Collins K; Jones ML; McDonnell A; Read S; Jones R; Cameron A; (2000 Jan) Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine? J Nurs Manag Vol. 8, p.3 -12". To the right of this panel are three buttons: "Search All Ref Manager Data", "Review Scored Refs", and "Report and Import Menu". Below the central panel, there are several buttons for data entry: "Type of Intervention", "Identified Driver for ESP" (with sub-items "Type of Information", "Quality Evaluation (from PSF)", "Data Analysis"), "Patient/Client Population" (with sub-items "User Involvement", "Professional Group, Location, Funding"), "Outcomes" (with sub-items "Bottom Line1", "Bottom Line 2"), "Descriptive data 1", and "Descriptive Data 2". A blue button labeled "Managing Links to other references" is positioned above two more buttons: "Adding a new link to another Reference" and "Manage Links to other References".

Sheet 1 Type of intervention

Type of Intervention : Form

ESP RefId: RefManagerID: **Type of Intervention** Extraction or Description:

ESP as per project definition (from PSF)

Role Enhancement	<input type="text" value="No"/>	ESP as per project definition (from PSF) comment
Role Substitution	<input type="text" value="No"/>	<input type="text"/>
Autonomy enhancement	<input type="text" value="No"/>	
Other 1	<input type="text" value="No"/>	
Other 2	<input type="text" value="No"/>	

Level of ESP

Access related ESP(ie new dir acc)	<input type="text" value="No"/>	Comment: <input type="text"/>
Non invasive assessment	<input type="text" value="No"/>	
Invasive assessment	<input type="text" value="No"/>	
Non invasive intervention	<input type="text" value="No"/>	
Invasive Intervention	<input type="text" value="No"/>	
Other	<input type="text" value="No"/>	

Reference

RefManID: RefType:

Ref Details:
Collins K; Jones ML; McDonnell A; Read S; Jones R; Cameron A; (2000 Jan)
Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine? J Nurs Manag Vol. 8, p.3-12

Specific ESP

Memo 1: Memo 2: Memo 3: Overall Comment:

Record: of 1 (Filtered)

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Sheet 2 Drivers of ESP, quality summary and design

ESP Drivers, Qual Eval, Study Design and Data Analysis

ESP Ref ID: RefManagerID:

Identified Driver for ESP

Main driver identified within paper/documentation:

Comment:

Subsidiary Driver 1 (ident. in study aims):

Comment 1:

Subsidiary Driver 2 (ident. in study aims):

Comment 2:

Subsidiary Driver 3 (ident. in study aims):

Comment 3:

Reference

RefManID: RefType:

Ref Details: Collins K; Jones ML; McDonnell A; Read S; Jones R; Cameron A; (2000 Jan) Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine? J Nurs Manag Vol. 8, p.3-12

Quality Evaluation

Were the aims and objectives of the research or report clearly stated?

Comment:

Do the authors display enough data to support their interpretations and conclusions?

Comment:

Was the design clearly specified AND appropriate for the aims and objectives of the research?

Comment:

Do the authors provide a clear account of the process by which their findings were produced?

Comment:

DataAnalysis

Study Design or report format (From PSF)

Comment:

Record: of 1 (Filtered)

Extended Roles for Allied Health Professionals

Sheet 3 Population, user involvement, professional group, location and funding

Population, User Involvement, Prof Group, Location & Funding

ESP RefId: 1 RefManagerID: 88

Patient Client Population

Primary condition (system)

Primary diagnosis (specific)

Secondary Diagnosis(specific)

Patient Age Group

Reference

RefManID: 88 RefType: JOUR

Ref Details: Collins K; Jones ML; McDonnell A; Read S; Jones R; Cameron A; (2000 Jan) Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine? J Nurs Manag Vol. 8, p.3-12

User Involvement

User involvement in indentifying need for service

User involvement in setting up service

User involvement in service delivery

User involvement in service evaluation

User involvement in other

User Involvement Comment:

Professional Group

Primary Prof delivering ESP

Primary Prof delivering ESP 2

Primary Prof delivering ESP 3

Other Professions Involved

Other Professions Affected:

Location of ESP

Geographic Location

Hosp/Community

Specific Location

Comment

Funding

Funding

Funding Comment

Record: 1 of 1 (Filtered)

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Sheet 4 Outcomes and bottom line

Outcomes & Bottom Line

ESP RefId: 1 RefManagerID: 88

Outcomes

Patient Orientated Clinical Outcome: No
Comment: [Text Area]

Patient Satisfaction: No
Comment: [Text Area]

Staff Involved Satisfaction: No
Comment: [Text Area]

Staff affected perspective: No
Comment: [Text Area]

Service/Organisational Outcomes (waiting times etc.): No
Comment: [Text Area]

Outcomes cont.

Economic Evaluation: No
Comment: [Text Area]

Reference:

RefManID: 88 RefType: JOUR
Ref Details: Collins K; Jones ML; McDonnell A; Read S; Jones R; Cameron A; (2000 Jan) Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine? J Nurs Manag Vol. 8, p.3-12

Overall perspective on ESP: [Dropdown]
Comment: [Text Area]

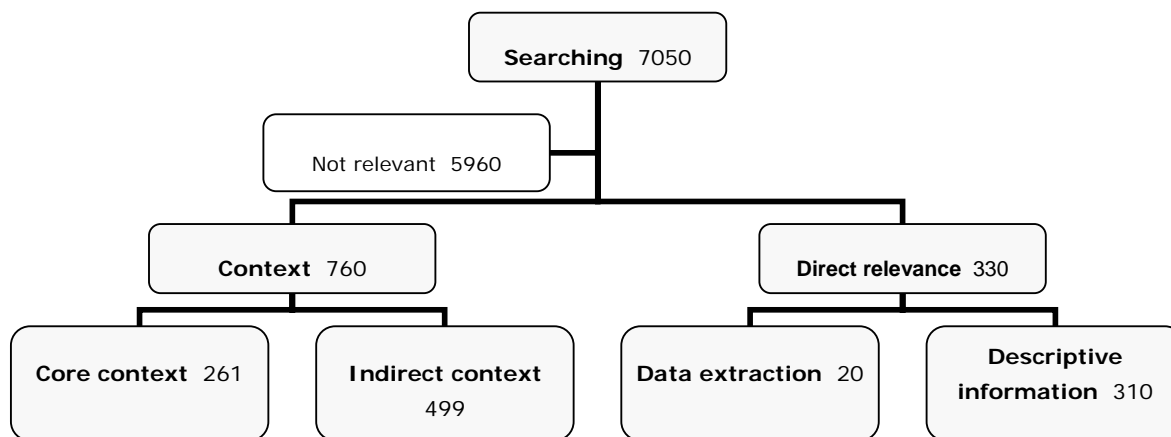
Free text description of main SUBSTANTIATED study findings (Bottom Line 1): [Text Area]

Final Comment: [Dropdown]
If other please give details: [Text Area]

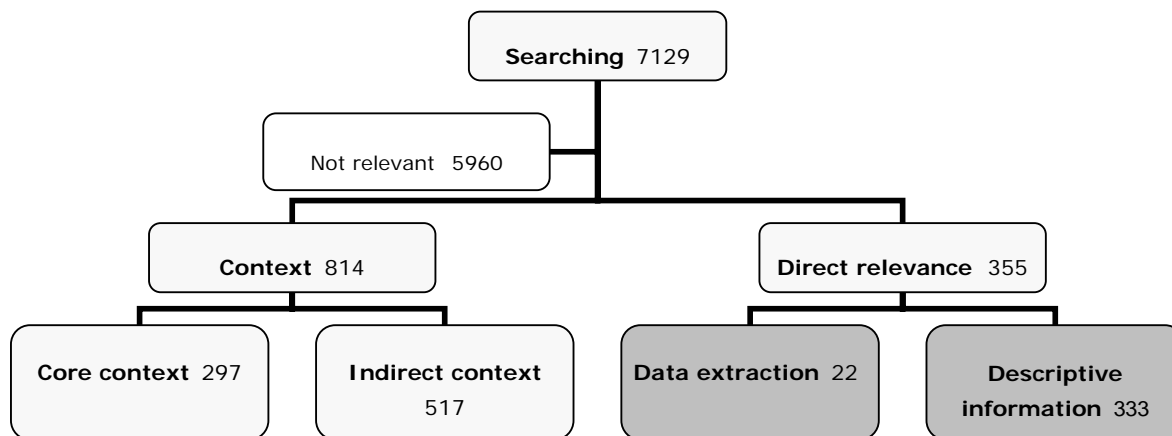
Record: 1 of 1 (Filtered)

Appendix 4 Summary of search strategy results

Original findings (to December 2003)



Updated findings (to May 2004)



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Appendix 5 Studies included for data extraction

Ref	Primary authors	Date	Primary title	Journal	Volume and page details
<i>Paramedics</i>					
295	Pitt, K.	2002	Prehospital selection of patients for thrombolysis by paramedics	<i>Emergency Medicine Journal</i>	19: 260–3
332	Gausche, M., Lewis, R.J., Stratton, J. <i>et al.</i>	2000	Effect of out-of-hospital pediatric endotracheal intubation on survival and neurological outcome: a controlled clinical trial	<i>Journal of the American Medical Association</i>	283: 783–90
343	Claridge, M.	2003	Local heroes: collaboration in improving care and access to early thrombolysis for patients in Avon	Unpublished	
344	Morrison, L.J., Verbeek, P.R, McDonald, A.C, <i>et al.</i>	2000	Mortality and prehospital thrombolysis for acute myocardial infarction	<i>Journal of the American Medical Association</i>	283: 2686–92
345	Dale, J., Higgins, J., Williams, S., <i>et al.</i>	2003	Computer assisted assessment and advice for ‘non-serious’ 999 ambulance service callers: the potential impact	<i>Emergency Medicine Journal</i>	20: 178–83
358	Pedley, D.K., Bissett, K., Connolly, E.M. <i>et al.</i>	2003	Prospective observational cohort study of time saved by prehospital thrombolysis for elevation myocardial infarction delivered by paramedics	<i>British Medical Journal</i>	327: 22–6
412	Weaver, W.D., Eisenberg, M.S. and Martin, J.S.	1990	Myocardial Infarction Triage and Intervention Project - Phase I: Patient characteristics and feasibility of prehospital initiation of thrombolytic therapy	<i>Journal of the American College of Cardiology</i>	15: 925–31
<i>Physiotherapy</i>					
119	Daker-White, G., Carr, A.J., Harvey, I. <i>et al.</i>	1999	A randomised controlled trial. Shifting boundaries of doctors and physiotherapists in orthopaedic outpatients departments	<i>Journal of Epidemiology and Community Health</i>	53: 643–50
329	Atkins E	2003	Physiotherapists’ experience of implementing their injection therapy skills	<i>Physiotherapy</i>	89: 145–57

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330	Milligan, J.	2003	Physiotherapists working as extended scope practitioners	<i>British Journal of Therapy & Rehabilitation</i>	10: 6–11
342	Hattam, P.	2002	Effectiveness of secondary referral by extended scope physiotherapists	<i>An abstract of this thesis is in Physiotherapy (2003)</i>	89(5): 324
399	Dawson, L.	2002	The experience of extended scope practitioners in orthopaedic outpatient clinics	Master's thesis	
<i>Mixed: occupational therapy and physiotherapy</i>					
337	Ellis, B. and Kersten, P.	2001	An exploration of the developing role of hand therapists as extended scope practitioners	<i>British Journal of Hand Therapy</i>	6: 126–30
331	Ellis, B. and Kersten, P.	2002	The developing role of hand therapists within the hand surgery and medicine services: an exploration of doctors' views	<i>British Journal of Hand Therapy</i>	7: 119–23
<i>Radiography</i>					
300	Parker, H.J., McCoy, J.F. and Connor, R.B.	1972	Delegation of tasks in radiology to allied health personnel. Reaction of radiologists	<i>Radiology</i>	103: 257–61
327	Price, R.C., Miller, L.R. and Mellor, F.	2002	Longitudinal changes in extended roles in radiography	<i>Radiography</i>	8: 223–34
328	Crawley, M.T., Shine, B. and Booth, A.	1998	Radiation dose and diagnosticity of barium enema examinations by radiographers and radiologists: a comparative study	<i>British Journal of Radiology</i>	71: 399–405
338	Bewell, J. and Chapman, A.H.	1996	Radiographer-performed barium enemas – results of a survey to assess progress	<i>Radiography</i>	2: 199–205
339	Hughes, H., Hughes, K. and Hamill, R.	1996	A study to evaluate the introduction of a pattern recognition technique for chest radiographs by radiographers	<i>Radiography</i>	2: 263–88
347	Pauli, R., Hammond, S., Cooke, J. and Ansell, J.	1996	Radiographers as film readers in screening mammography: an assessment of competence under test and screening conditions	<i>The British Journal of Radiology</i>	69: 10–14
349	Berman, L., deLacey, G., Twomey, E. <i>et al.</i>	1985	Reducing errors in the accident department: a simple method using radiographers	<i>British Medical Journal</i>	290: 421–2
<i>Speech and language therapy</i>					
340	Rattenbury, H.J., Carding, P.N. and Finn, P.	2004	Evaluating the effectiveness and efficiency of voice therapy using transnasal flexible laryngoscopy: A randomized controlled trial.	<i>Journal of Voice</i>	18: 522–33

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Appendix 6 Studies included for description only

ESP overall	Ref	Primary authors	Date	Primary title	Journal or book title/publication type	Volume and page details
A	410	Alcorn, F.S., O'Donnell, E., Ackerman, L.V. <i>et al.</i>	1971	The protocol and results of training non-radiologists to scan	<i>Radiology</i>	99: 523–9
A	142	The Chartered Society of Physiotherapy	1999	Information Paper PA 21. Physiotherapists working outside the scope of physiotherapy practice	Report	pp. 1–2
A	310	Bassett, L.W., Hollatz-Brown, A.J., Bastani, R. <i>et al.</i>	1995	Effects of a program to train radiologic technologists to identify abnormalities of mammograms	<i>Radiology</i>	194: 189–92
A	308	Brealey, S., King, D.G., Crowe, M.T. <i>et al.</i>	2003	Accident and emergency and general practitioner plain radiograph reporting by radiographers and radiologists: a quazi randomised controlled trial	<i>British Journal of Radiology</i>	76: 57–61
A	192	Byles, S.E. and Ling, R.S.M.	1989	Orthopaedic out-patients - a fresh approach	<i>Physiotherapy</i>	75: 435–7
A	165	Carding, P. and Rattenbury, H.J.	2003	Video Laryngeal Endoscopy and the role of the voice pathologist	Unpublished	
A	58	Cohen, J.	2002	ESPs -- extending our skills	<i>Physiotherapy Frontline</i>	Boundaries supplement series 3: 8–9
A	1	Collins, K., Jones, M.L., McDonnell, A. <i>et al.</i>	2000	Do new roles contribute to job satisfaction and retention of staff in nursing and professions allied to medicine?	<i>Journal of Nursing Management</i>	8: 3–12
A	313	Colyer, H.	2000	The role of the radiotherapy treatment review radiographer	<i>Radiography</i>	6: 253–60
A	185	Doncaster Royal Infirmary	2003	Orthopaedic Physiotherapy Practitioner	Unpublished audit	

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	DoONM			Evaluation		
A	45	Durrell, S.	1996	Expanding the scope of physiotherapy: Clinical physiotherapy specialists in consultants' clinics	<i>Manual Therapy</i>	1: 210–13
A	371	Edwards, J.	1995	The expanding role of the radiographer	<i>Radiologic Science and Education</i>	2: 15–21
A	402	Flehinger, B.J., Melamed, M.R., Heelan, R.T. <i>et al.</i>	1978	Accuracy of chest film screening by technologists in the New York early lung cancer detection program	<i>American Journal of Roentgenology</i>	131: 593–9
A	336	Gardiner, J. and Turner, P.	2002	Accuracy of clinical diagnosis of internal derangement of the knee by extended scope physiotherapists and orthopaedic doctors: Retrospective audit	<i>Physiotherapy</i>	88: 153–7
A	281	Hogg, P.	1993	The expanding role of nuclear medicine radiographers	<i>Radiography Today</i>	59: 42–2
A	292	Jenik, C.A., Protzman, R.R. and McKennett, D.	1984	The Army occupational therapist as an orthopaedic health care extender	<i>Military Medicine</i>	149: 383–8
A	199	Langridge, J.C. and Moran, C.J.	1984	A comparison of two methods of managing patients suffering from rheumatoid arthritis	<i>Physiotherapy</i>	70: 109–13
A	370	Leslie, A., Lockyer, H. and Virjee, J.P.	2000	Who should be performing routine abdominal ultrasound? A prospective double-blind study comparing the accuracy of radiologist and radiographer	<i>Clinical Radiology</i>	55: 606–9
A	325	Lo, R.H.G., Chan, P.P., Wilde, C.C. and Pant, R.	2003	Routine abdominal and pelvic; ultrasound examinations: An Audit comparing radiographers and radiologists	<i>Annals of the Academy of Medicine of Singapore</i>	32: 126–8
A	411	Loughran, C.F.	1994	Reporting of accident and emergency radiographs by radiographers: a study to determine the effectiveness of a training programme	<i>British Journal of Radiology</i>	67 (Congress supplement) : 945–50
A	268	Mannion, R.A.J., Bewell, J.,	1995	A barium enema training programme for	<i>Clinical Radiology</i>	50: 715–19

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		Langan, C. <i>et al.</i>		radiographers: A pilot study		
A	397	Nuttall, L.	1995	Changing practice in radiography	in <i>Current Topics in Radiography</i> (Paterson, A. and Price, R., eds) (London: Saunders)	28–38
A	335	Persutte, W.H., Drose, J., Spitz, J.L. <i>et al.</i>	1999	Advanced-practice sonography in obstetrics and gynecology: a pilot study investigating the efficacy of the ultrasound practitioner	<i>Journal of Allied Health</i>	28: 71–9
A	361	Robinson, P.J.A.	1996	Short Communication: plain film reporting by radiographers - a feasibility study	<i>British Journal of Radiology</i>	69: 1171–4
A	315	Robinson, P.J.A., Culpán, G. and Wiggins, M.	1999	Interpretation of selected accident and emergency radiographic examinations by radiographers: a review of 1100 cases	<i>British Journal of Radiology</i>	72: 546–51
A	403	Sheft, D.J., Jones, M.D., Brown, R.F. and Ross, S.E.	1970	Screening of chest: roentgenograms by advanced roentgen technologists mammograms	<i>Radiology</i>	94: 427–9
A	296	Snooks, H., Williams, S., Crouch, R. <i>et al.</i>	2002	NHS emergency response to 999 calls: alternatives for cases that are neither life threatening nor serious	<i>British Medical Journal</i>	325: 330–3
A	317	Suter, B., Shoulders, B., Maclean, M. and Balycky, J.	2000	Machine verification radiographs: An opportunity for role extension?	<i>Radiography</i>	6: 245–51
A	158	Swindon and Marlborough NHS Trust	1999	Swindon and Marlborough NHS Trust Clinical Audit Record: Clinical Physiotherapist Specialist Role	Unpublished audit	
A	390	The Chartered Society of Physiotherapy	2001	Information paper PA 23. Specialisms and specialists: Guidance for developing the clinical specialist role	Information paper	
A	291	Weale, A.E. and Bannister, G.C.	1995	Who should see orthopaedic outpatients -- physiotherapists or surgeons	<i>Annals of the Royal College Surgeons of England</i>	77: 71–3
A	209	Yelland, N. and Cairns, M.C.	2000	Outcome of triaging from a collaborative physiotherapy/consultant low back pain triaging clinic	Conference proceedings	p. 5

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A	210	Yelland, N. and Cairns, M.C.	1999	The outcome of a collaborative physiotherapy/consultant low back pain triage clinic	Conference proceedings	p. 42
B	305		1994	Expanded-scope plans gain momentum	<i>EMS Insider</i>	21: 4–5
B	104		1994	Florida EMS personnel expand into public health	<i>EMS Insider</i>	21: 1
B	102		1993	Indiana developing first statewide paramedic physician-extender program	<i>EMS Insider</i>	20: 1
B	103		1992	Private ambulance company proposes expanded paramedic role	<i>EMS Insider</i>	19: 1
B	320		1994	Privates expanding paramedics' practice	<i>EMS Insider</i>	21: 3–4
B	321		2002	Rural paramedics provide expanded services	<i>EMS Insider</i>	29: 8
B	105		1996	Utah adopts expanded scope for prolonged EMS care	<i>EMS Insider</i>	23: 1
B	52		2002	At the cutting edge	<i>Physiotherapy Frontline</i>	Boundaries supplement series 312–13
B	126		2001	Clinical career development in radiography -- a position paper	<i>Synergy</i>	<i>Synergy News</i> , 14–15
B	237		2003	How much training will be needed?	<i>Physiotherapy Frontline</i>	June
B	53		2002	Looking at roles for ESPs	<i>Physiotherapy Frontline</i>	Boundaries supplement series 3: 10–11
B	287	Changing Workforce Programme	2003	New Ways of Working in Health Care	www.modern.nhs.uk/cwp	pp. 1–80
B	365		1993	Radiographers to interpret film	<i>Radiography Today</i>	59: 1
B	51		2001	Research shows injections are justified in	CSP's Annual Congress, Birmingham. 19–21 October	7: 11

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				physio practice		
B	379	Aberdour, K.R.	1976	Must radiologists do all the reporting?	<i>British Journal of Radiology</i>	49: 573–3
B	167	Booth, A.	2003	A survey of GIRSIG members' current practice	Unpublished survey	
B	97	American Speech-Language-Hearing Association	1998	The roles of otolaryngologists and speech-language pathologists in the performance and interpretation of stroboscopy	<i>ASHA</i>	40: 32–32
B	54	Ashton, J.	2002	Innovation and change part of being an autonomous profession... 'Prescribing cannot cure physiotherapy of its ills' (Frontline, June 5)	<i>Physiotherapy Frontline</i>	8: 26
B	202	Atkinson, B.	2003	Extended scope practitioner 'plus'	www.nyx.org.uk/modernprogrammes/primarycare/goodpractice/june%202002/extended.html	
B	107	Aufderheide, T.P., Kereiakes, D.J., Weaver, W.D. <i>et al.</i>	1996	Planning, implementation, and process monitoring for prehospital 12-lead ECG diagnostic programs	<i>Prehospital & Disaster Medicine</i>	11: 162–71
B	162	Bartley, R.	2003	Low back pain triage systems	Unpublished	
B	161	Bartley, R.	2003	The Oxford LBP Triage Clinic	Unpublished	
B	127	Beardmore, C.	2003	I relish the day when consultant and advanced practitioners are referred their own caseloads	<i>Synergy</i>	<i>Synergy News 1</i>
B	166	Beckham, C.	2003	Therapist-led hand clinics	Unpublished	
B	286	Benger, J.R., Karlsten, R. and Eriksson, B.	2002	Prehospital thrombolysis: - Lessons from Sweden and their application to the United Kingdom	<i>Emergency Medicine</i>	6: 583
B	7	Benson, C.J., Schreck, R.C., Underwood, F.B. <i>et al.</i>	1995	The role of Army physical therapists as nonphysician health care providers who prescribe certain medications: observations and experiences	<i>Physical Therapy</i>	75: 380–6

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B	87	Bissell, R.A., Seaman, K.G., Bass, R.R. <i>et al.</i>	1999	A medically wise approach to expanding the role of paramedics as physician extenders	<i>Prehospital and Emergency Care</i>	3: 170–3
B	110	Brayley, N.	2000	Guest editorial. The need for radiographer reporting: an accident & emergency department (A&E) perspective	<i>Radiography (London)</i>	6: 227–9
B	13	Brealey, S.	2001	Measuring the effects of image interpretation: an evaluative framework	<i>Clinical Radiology</i>	56: 341–7
B	282	Brealey, S.	2001	NoQuality assurance in radiographic reporting: a proposed framework	<i>Radiography (London)</i>	7: 263–70
B	309	Brooks, D., Schoenfeld, M.D. and Ransohoff, D.F.	2003	Licensure, use, and training of paramedical personnel to perform screening flexible sigmoidoscopy	<i>Gastrointestinal Endoscopy</i>	49
B	56	Byrne, P.	2002	Job-swap for seamless care	<i>Physiotherapy Frontline</i>	8: 13
B	283	Cameron, A. and Masterson, A.	2002	Role development: the evidence base... second of a series of articles	<i>Synergy</i>	20–2
B	290	Campos, A.A., Graveline, C., Ferguson, J. <i>et al.</i>	2002	The physical therapy practitioner (PTP) in pediatric rheumatology: High level of patient and parent satisfaction with services	<i>Physiotherapy Canada</i>	54: 32–6
B	288	Campos, A.A., Graveline, C., Ferguson, J.M. <i>et al.</i>	2001	The physical therapy practitioner: an expanded role for physical therapy in pediatric rheumatology	<i>Physiotherapy Canada</i>	53: 282–7
B	164	Carding, P.	2003	Voice pathology clinics in the UK	<i>Clinical Otolaryngology & Allied Sciences</i>	28(6): 477
B	284	Carr, A.	2002	Defining the extended clinical role for allied health professionals in rheumatology. Arc Conference Proceedings no 12	www.arc.org.uk/about_arth/opubs/6906/cp12.pdf	1–53
B	404	Cassidy, S., Eyres, R.D., Thomas, N.B. <i>et al.</i>	1999	A comparative study of the reporting accuracy of clinical radiographers and radiology registrars	<i>Radiology, Imaging, Science and Oncology</i>	72 (suppl): 19
B	57	Carr, M.N.	1994	Physical therapists in home care: yesterday, today, and tomorrow	<i>Caring</i>	13: 38–40

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B	203	Carr, P.	2002	Elective project. Review of extended scope roles in professions allied to medicine	www.chl.wales.nhs.uk/resource/electives/report-peter.pdf	
B	316	Celia, M., Paluck, J.N. and Smith, R.S.	1995	Critical Care Transport: An evolving role in EMS	<i>JEMS Journal of Emergency Medical Services</i>	20: 90–4
B	279	Cheyne, N., Field-Boden, Q., Wilson, I. and Hall, R.	1987	The radiographer and frontline diagnosis	<i>Radiography (London)</i>	53: 114
B	173	Cohen, J.	2002	Update on prescribing	<i>HORIZON (ESP Newsletter)</i>	11: 11–12
B	273	College of Occupational Therapists	2003	COT/BAOT Briefings. Extended scope practice	Report	1–7
B	36	Cooperman, J.M. and Sullivan, C.	1986	Surgical orthopaedic physical therapy - a new role for the PT	<i>Clin Manag Phys Ther</i>	6: 22–3
B	129	Cross, S.	1999	Role reversal... a radiographer has been trained to work as a nurse practitioner	<i>Nursing Standard</i>	12: 16–30
B	235	Cussans, A.J.	2001	A survey of extended scope practitioners managing low back pain, perceptions of their clinical role, working practices and integration within health care services	Thesis/dissertation	
B	14	Davis, D., Faucher, D., McMillan, D. <i>et al.</i>	2000	Enhanced roles for health professionals in newborn care	<i>Paediatrics & Child Health</i>	5: 106–14
B	385	Deakin, C.D.	2000	Anaesthetic skills are required for prehospital management of the airway in major trauma (letter) Error in original title as published: Anaesthetists are best people to provide prehospital airway management.	<i>British Medical Journal</i>	320: 1005
B	230	Department of Health	2003	Allied health professions - building careers	www.doh.gov.uk/nhsexec/buildingcareers.htm	
B	348	Department of Health	2003	Implementing a scheme for Allied Health Professionals with Special Interests	www.doh.gov.uk/pricare/gp-specialinterests/ahpwsj.pdf	
B	389	Department of Health	2000	Meeting the challenge: a strategy for the allied health professions	www.dh.gov.uk/assetRoot/04/05/51/80/04055180.pdf	
B	204	Dickens, V., Ali, F., Gent, H.	2003	Assessment and diagnosis of knee injuries	<i>Physiotherapy</i>	89: 417–22

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		and Rees, A.				
B	111	Domeier, R.M., Hill, J.D. and Simpson, R.D.	1996	The development and evaluation of a paramedic-staffed mobile intensive care unit for interfacility patient transport	<i>Prehospital & Disaster Medicine</i>	11: 37–43
B	187	Doncaster and Bassetlaw Hospitals NHS Trust (Clarkson, H.H.I.)	2001	Orthopaedic Physiotherapy Practitioner Service Annual Review (2000/2001). Primary Care	Unpublished	
B	409	Dowdy, A.H., Lagasse, L.D., Roach, P. and Wilson D	1970	Lay screeners in mammographic survey programs	<i>Radiology</i>	95: 619–21
B	59	Duffy, E.	2002	Physios stand to gain more respect by extending their skills... reply to Richard Shortall's letter	<i>Physiotherapy Frontline</i>	8–27
B	211	Durrell, S., Caswell, N., German, N. and Jones S	2000	Waiting list and waiting performance fund. Physiotherapy practitioner clinics report	Unpublished	
B	212	Durrell, S., Jones, S. and German, N.	1999	Orthopaedic physiotherapy practitioners' patient satisfaction questionnaire. Report 1998/1999	Unpublished	
B	218	Durrell, S., Kakkar N	1997	Specialist physiotherapists effectively managing selected orthopaedic outpatients	Unpublished	
B	99	Ehren, B.J. and Ehren, T.C.	2001	New or expanded literacy roles for speech-language pathologists: making it happen in the schools	<i>Seminars in Speech & Language</i>	22: 233–43
B	232	Evans, J.	1999	Skills-mix and the future for radiographers	<i>Synergy</i>	June
B	258	Eyres, R.D., Henderson, I., Paterson, A.M. <i>et al.</i>	1997	The implementation of radiographic reporting	<i>Radiology</i>	70 (suppl): 123
B	205	Farmer, S.S.	2000	Literacy brokering: An expanded scope of practice for SLPs	<i>Topics in Language Disorders</i>	21: 68–81
B	35	Fernando, R.	1999	The radiographer reporting debate - The relationship between radiographer reporting,	<i>Radiography</i>	5: 177–9

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				diagnostic ultrasound and other areas of role extension [2]		
B	277	Foster, A.	2002	Acute hospital portfolio: radiology, review of national findings	www.audit-commission.gov.uk	7 July: 1–30
B	130	Foulsham, A.	1997	Radiotherapy round-up. Role extension -- radiographer-led treatment reviews	<i>Synergy</i>	April: 12
B	60	Fowler, J. and Cameron, G.	1998	High standards for injecting physiotherapists... Vol 5(8) 1998, p. 409	<i>British Journal of Therapy & Rehabilitation</i>	5: 596–7
B	186	Frimley Park Hospital NHS Trust (Bailey, C.D.E.)	2003	Knee Orthopaedic Practitioner Clinics. Nineteen Month Summary	Unpublished	
B	81	Gardiner, J. and Wagstaff, S.	2001	Extended scope physiotherapy: the way towards consultant physiotherapists?	<i>Physiotherapy</i>	87: 2–3
B	131	Garfield, L.	1999	Mammography. An innovative symptomatic breast service: leading the way forward to an enhanced professional role	<i>Synergy</i>	November, 18: 20, 22
B	242	Garza, M.	1994	Rethinking EMS: After Sand Key, things will never be the same	<i>Journal of Emergency Medical Services</i>	5: 103–7
B	83	Garza, M.A.	1994	Florida and Texas expand expanded-scope programs	<i>Journal of Emergency Medical Services</i>	19: 79–81
B	113	Garza, M.A.	1996	Paramedics -- the next generation... paramedic extended-scope-of-practice programs	<i>Journal of Emergency Medical Services</i>	18: 89–94
B	243	Garza, M.A.	1995	Special report - Expanding our services. Reality strikes at Sand Key II	<i>Journal of Emergency Medical Services</i>	20: 55–9
B	293	Glauner, J.H., Ekes, A.M., James, A.E. and Holm, M.B.	1997	A pilot study of the theoretical and technical competence and appropriate education for the use of nine physical agent modalities in occupational therapy practice	<i>American Journal of Occupational Therapy</i>	51: 767
B	263	Gloucestershire Hospitals NHS	2003	Orthopaedic screening service (West Glos	Unpublished	

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	Trust		PCT)			
B	221	Grace, A.R.H. and Walker, E.D.	2002	Action on ENT Voice Clinic Pilot Project: Development and Validation	Unpublished	
B	229	Greater Manchester Workforce Development Confederation	2003	Allied Health Professions	Report	
B	8	Greathouse, D.G., Schreck, R.C. and Benson, C.J.	1994	The United States Army; physical therapy experience: evaluation and treatment of patients with neuromusculoskeletal disorders	<i>Journal of Orthopaedic and Sports Physical Therapy</i>	19: 261-6
B	61	Griffiths, A.	2001	Prescribing rights logical step forward... Frontline from Congress on injection therapy	<i>Physiotherapy Frontline</i>	7: 26
B	114	Harbert, K. and White, G.L.	1995	Previous paramedics preferred 'Expanding our services: reality strikes at Sand Key II'	<i>Journal of Emergency Medical Services</i>	20: 12
B	46	Harrison, J., Rangan, A., Shetty, A. and Robinson, C.	2001	Reducing waiting times; physiotherapy shoulder assessment clinic	<i>British Journal of Therapy & Rehabilitation</i>	8: 57-9
B	3	Hattam, P. and Smeatham, A.	1999	Evaluation of an orthopaedic screening service in primary care	<i>Clinical Performance and Quality Healthcare</i>	7: 121-4
B	381	Hayton, T., Cope, D., Ahmed, S. <i>et al.</i>	1999	An audit of an open access ultrasound service for direct referral from general practitioners	<i>British Journal of Radiology</i>	72: 63-3
B	62	Hepburn, D.	2002	CSP and the profession working hard to promote physios' skills...Richard Shortall's letter (June 5)	<i>Physiotherapy Frontline</i>	8: 25-6
B	276	Hilpern, K.	2003	Diverse roles for healing hands	<i>The Independent</i>	26 September, 2-3
B	275	Hilpern, K.	2003	Our worth is being recognised	<i>The Independent</i>	26 September, 6-7
B	132	Ho, S.S.Y., Griffith, J.F. and Metrewelli, C.	1999	The first Red Dot system in Hong Kong Hong Kong -- initial experience in the Prince of Wales hospital	<i>Radiographers Journal</i>	3: 3-6

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B	63	Hobden, J.	1999	Extending the respiratory role	<i>Physiotherapy Frontline</i>	5: 22–3
B	15	Hockin, J. and Bannister, G.	1994	The extended role of a physiotherapist in an out-patient orthopaedic clinic	<i>Physiotherapy</i>	80: 281–4
B	65	Hodgson, K.	2000	Day of the super physio	<i>Physiotherapy Frontline</i>	6: 22–3
B	66	Hodgson, K.	2001	Pilot programme for ESPs in Wales wins acclaim	<i>Physiotherapy Frontline</i>	7: 13
B	67	Hodgson, K.	2001	Three groups join forces at Congress	<i>Physiotherapy Frontline</i>	7: 12
B	181	Hogg, P. and Holmes, K.	2000	Interpretation of nuclear medicine data by non-medical health care professionals: developments in the United Kingdom	<i>Journal of Diagnostic Radiography and Imaging</i>	3: 63–71
B	240	Hogg, P. and Holmes, K.	2003	Nuclear medicine image reading by British technologists and radiographers	Conference Proceedings	
B	294	Hogg, P., Williams, P. and Norton, S.	1997	Extended roles of radiographers working in nuclear medicine: a survey of current practice	<i>Radiography</i>	3: 179–90
B	182	Holmes, K., Griffiths, M. and Vivian, G.	2003	Assessment of the technologist reporting in nuclear medicine	<i>Synergy</i>	March, 10: 14
B	241	Holmes, K., Vivian G	2000	Evaluation of a technical reporting course for technologists	Conference proceedings	
B	68	Holt, T.	2002	Plaudits for injection therapy course... Richard Shortall (Frontline, June 5)	<i>Physiotherapy Frontline</i>	8: 25
B	249	Hourigan, P.	1999	Patrick's been busy again!	<i>HORIZON (ESP Newsletter)</i>	4: 2–3
B	251	Hourigan, P.	2001	The role of the specialist physiotherapist	in <i>Management of Low Back Pain in Primary Care</i> (Bartley, R. and Coffey, P., eds) (Oxford: Butterworth Heinemann)	171–4
B	196	Hourigan, P.G. and Weatherley, C.R.	1998	Developments in physiotherapy: Extended scope practitioner	<i>Newsletter of the Association of Chartered Physiotherapists in Management</i>	Spring, 3–5
B	193	Hourigan, P.G. and Weatherley, C.R.	1994	Initial assessment and follow-up by a physiotherapist of patients with back pain referred to a spinal clinic	<i>Journal of the Royal Society of Medicine</i>	87: 213–15
B	195	Hourigan, P.G. and	1995	The physiotherapist as orthopaedic assistant	<i>Physiotherapy</i>	81: 456–8

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		Weatherley, C.R.		in a back pain clinic		
B	355	Howard, L.	2002	A survey of paediatric occupational therapists in the United Kingdom	<i>Occupational Therapy International</i>	9: 326–43
B	175	Jackson, S.	2002	Musculoskeletal ESP - variation on a theme	<i>HORIZON (ESP Newsletter)</i>	12: 9–10
B	12	James, J.J. and Abshier, J.D.	1981	The primary evaluation of musculoskeletal disorders by the physical therapist	<i>Military Medicine</i>	146: 496–9
B	144	James, J.J.S.R.B.	1975	Expanded role for the physical therapist- Screening musculoskeletal disorders	<i>Physical Therapy</i>	55: 121–32
B	16	Jibuike, O.O., Paul-Taylor, G., Maulvi, S. <i>et al.</i>	2003	Management of soft tissue knee injuries in an accident and emergency department: The effect of the introduction of a physiotherapy practitioner	<i>Emergency Medicine Journal</i>	20: 37–9
B	172	Jones, C.	2002	Spinal clinic - a single point access for patients with spinal pain	<i>HORIZON (ESP Newsletter)</i>	11: 10–11
B	163	Jones, S.	2003	Gaining a voice	<i>RCSLT Bulletin</i>	September: 7–8
B	96	Kagan, A.	1995	Family perspectives from three aphasia centers in Ontario, Canada	<i>Topics in Stroke Rehabilitation</i>	2: 33–52
B	216	Kakkar, N.	1995	Are we taking on orthopaedic surgeons' work?	<i>AOCP Magazine</i>	2: 12–15
B	217	Kakkar, N., Durrell S	1995	Orthopaedic physiotherapy practitioner	Newsletter	
B	34	Keenan, L.Y., Muir, C. and Cuthbertson, L.M.	2001	Maximizing the benefit-minimizing the risk: The developing role of radiographers in performing intravenous injections	<i>British Journal of Radiology</i>	74: 684–9
B	396	Kerr, S. and Vinjamuri, S.	2001	The radiographer and role expansion in nuclear medicine	<i>Nuclear Medicine Communications</i>	22: 899–902
B	252	King's Lynn and Wisbech Hospitals NHS Trust (Hogan, S.)	2001	Appropriateness of requests for MRI scans	Unpublished	
B	299	Knight, M.	2000	The ESP role in the private sector - The	<i>HORIZON (ESP Newsletter)</i>	7

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				surgeon's view		
B	115	Lonchena, T.	1979	Guest editorial. The next step for paramedics: part 1	<i>Emergency Medical Services</i>	31: 77
B	360	Loughran, C.F.	1994	Reporting on fracture radiographs by radiographers: the impact of a training programme	<i>British Journal of Radiology</i>	49: 617–20
B	69	Mallion, C.	2002	Injecting adjunct to physiotherapy, not a replacement for it... comments from Richard Shortall	<i>Physiotherapy Frontline</i>	8: 26
B	267	Martin, E.	1987	The radiographer and the front line diagnosis	<i>Radiography</i>	53: 160
B	133	May, L.	2001	CEO report... R.T. clinical specialist	<i>Asrt Scanner</i>	34: 14
B	152	Mayday Hospital NHS Trust (Peerman, S.)	2001	Assessment of Impact of New Orthopaedic Physiotherapy Practitioner on the Waiting List, July 2000 - January 2001	Unpublished	
B	362	McInnes, E.	1993	Should there be a shift in sonographer involvement	<i>Radiography Today</i>	59: 45
B	323	McKenzie, G.A., Mathers, S., Graham, D.T. and Chesson, R.A.	1998	An investigation of radiographer-performed barium enemas	<i>Radiography</i>	4: 17–22
B	261	McMillan, P., Paterson, A. and Piper, K.	1995	Other publications and presentations: Do radiologists really need to report on everything?	http://health.cant.ac.uk/allied-health-professions/research/clinical-reporting/need-to-report.htm	
B	145	Mid Essex Hospitals NHS Trust (Jayne, S.)	2002	OPP Spinal Clinic MRI Audit	Unpublished	
B	146	Mid Essex Hospitals NHS Trust (Walsham, E.J.S.)	2001	OPP Audit in Mid Essex Hospitals NHS Trust	Unpublished	
B	151	Mid Essex Hospitals NHS Trust (Walsham, E.J.S.P.)	2000	OPP Satisfaction Audit in MENHS Trust. November 2000	Unpublished	
B	11	Miller, W.T.	1984	An occupational therapist as a sexual health clinician in the management of spinal cord	<i>Canadian Journal of Occupational Therapy</i>	51: 172–5

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injuries						
B	70	Milligan, J. and Hourigan, P.	2002	Putting the record straight on ESPs... 'Confusion reigns over the role of ESPs' (Frontline, November 21, 2001)	<i>Physiotherapy Frontline</i>	8: 27-8
B	231	Mudd, D.	2002	Modernising trauma and orthopaedic services in the National Health Service	<i>Business Briefing Medical Device Manufacturing and Technology</i>	1-4
B	159	Murray, M.	2003	Extended scope practitioner orthopaedics hand clinics. Whipps Cross University Hospital NHS Trust, January-April 2003	Unpublished	
B	228	NHS Modernisation Agency Changing Workforce Programme	2003	Salford Allied Health Professions Pilot Phase 1 Report	Report	
B	222	NHS Modernisation Agency	2002	Action on ENT Good Practice Guide	Report	
B	71	Nisbett, J.	2002	Southampton physio among those injecting botulinum toxin...Frontline (March 20)	<i>Physiotherapy Frontline</i>	8: 26
B	149	North Glasgow University Hospitals NHS Trust (Reid, J.)	2000	Implementation and Evaluation of the Role of the Orthopaedic Specialist Physiotherapist in the Orthopaedic Outpatient Department. March 2000	Unpublished	
B	238	Northamptonshire Heartlands NHS Primary Care Trust	2003	Baseline audit of an intermediate orthopaedic service September 2003	Unpublished	
B	393	NHS Modernisation Agency	2002	Improvement in Emergency Care: Case studies		1-93
B	72	Oliveck, M.	2000	A&E is the place to be	<i>Therapy</i>	27: 4
B	180	Orr, B.	2003	Musculoskeletal interface service. North Bristol NHS Trust	<i>HORIZON (ESP Newsletter)</i>	6: 6-9
B	73	Orr, B.	2002	Physios not singing from same hymn sheet... 'Confusion reigns over the role of ESPs' (Frontline, November 21, 2001)	<i>Physiotherapy Frontline</i>	8: 27-8
B	206	Orr, B.	2003	Southmead back pain triage service	Unpublished	

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B	74	Owen, G.	1998	Extended scope practitioners in orthopaedic outpatient clinics: a growing field in the UK	<i>Rehab Management International</i>	8: 33–4, 48
B	76	Oxlade, L.	2001	Prescription for better patient care... CSP's Annual Congress, Birmingham, 19–21 October 2001	<i>Physiotherapy Frontline</i>	7: 15
B	136	Paterson, A.	1996	View of the future. The radiographer towards 2000	<i>Synergy</i>	January, 26–7
B	256	Paterson, A.M., Piper, K.J. and Ryan, C.M.	2003	The implementation of a radiographic reporting service for skeletal trauma	<i>European Radiology</i>	9: 120
B	307	Paterson, A.M. and SIGRR Special Interest Group in Radiographic Reporting	1999	Inter-professional roles and responsibilities in a radiology service - an appraisal of the joint document of the Royal College of Radiologists and College of Radiographers	<i>RAD Magazine</i>	30
B	220	Peck, F., Kennedy, S. and McKirdy, L.	2001	The introduction of practitioner-led hand clinics in South Manchester	<i>British Journal of Hand Therapy</i>	6: 41–4
B	153	Peerman, S.	2000	Impact of Orthopaedic Practitioner on Orthopaedic Waiting Lists for Backs and Knees - Interim Report 25/9/00	Unpublished	
B	322	Petit, C.	1997	Experts' corner. Expanded EMS: where are we now?	<i>EMS Insider</i>	24: 6
B	318	Pickett, M.W., Waterstram Rich, K. and Turner, L.W.	2000	The future of nuclear medicine technology: are we ready for advanced practice?	<i>Journal of Nuclear Medicine Technology</i>	28: 280–6
B	259	Piper, K. and Paterson, A.	1997	Accuracy of radiographers' reports in accident and emergency examinations of the skeletal system	<i>European Radiology</i>	7: S178–9
B	255	Piper, K., Ryan, C. and Paterson, A.	2002	Funded research project: The implementation of a radiographic reporting service for trauma examinations of the skeletal system	http://health.cant.ac.uk/allied-health-professions/research/clinical-reporting/funded-research-project.htm	
B	350	Polmanteer, K.N.	1999	Who releases to whom: A study of transdisciplinary teams in early intervention	Thesis/dissertation	

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B	78	Potter, R.	2002	Extending the boundaries	<i>Physiotherapy Frontline</i>	8: 8
B	77	Potter, R.	2001	Profession still divided on injection therapy... CSP's annual Congress, held in Birmingham from October 19 to 21	<i>Physiotherapy Frontline</i>	7: 11
B	137	Price, R.C.	2001	Radiographer reporting: origins, demise and revival of plain film reporting	<i>Radiography (London)</i>	7: 105-17
B	125	Price, R.C.	1998	Radiographers meet 'old' challenge... radiographic reporting	<i>Radiography</i>	4: 237-8
B	366	Price, R.C., Le Mausier, S., High, J. and Miller, L.	1999	Changing times: a national survey of extended roles in diagnostic radiography. 'Radiology 1999 -- Imaging Science and Oncology. Programme and Abstracts'	<i>British Journal of Radiology</i>	72: 7
B	138	Price, R.C. and Paterson, A.M.	2002	Consultant practitioners in radiography -- a discussion paper	<i>Radiography (London)</i>	8: 97-106
B	303	Prime, N.J., Paterson, A.M. and Henderson, P.I.	1999	The development of a curriculum - A case study of six centres providing courses in radiographic reporting	<i>Radiography</i>	5: 63-70
B	55	Puhakka, K.	1998	Viewpoint. Confused identity hurts the image of physiotherapy	<i>Physiotherapy Canada</i>	50: 245-7
B	369	Quick, J.	1993	Dealing with the gathering of pace of change	<i>Radiography Today</i>	59: 33-6
B	280	Racette, K.	1997	Radiology practitioners to fill health care void	<i>Asrt Scanner</i>	30: 16
B	79	Reid, J.	2002	An orthopaedic PT in extension	<i>Therapy</i>	28: 4
B	155	Reid, J.	2002	Orthopaedic Specialist Physiotherapist Patient Satisfaction Survey 2001 - 2002	Unpublished	
B	47	Robinson, P.	2002	Injecting a new role into the profession	<i>Physiotherapy Frontline</i>	8: 6-7
B	169	Rogers, D. and Uttley, W.	2003	Are back pain clinic orthopaedic physiotherapy practitioners referring patients with sciatica appropriately for steroid epidural injection?	<i>HORIZON (ESP Newsletter)</i>	13: 16-18

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B	179	Roper, L.A.	2003	Musculoskeletal interface service. Hip Interface service -Pilot project report	<i>HORIZON (ESP Newsletter)</i>	6: 10–12
B	139	Ross, C.	2000	Should reporting radiographers be able to request additional projections?	<i>Synergy</i>	February, 4–6
B	148	Royal Wolverhampton Hospitals NHS Trust (Rutter, M.)	2001	A Review of Orthopaedic Physiotherapist Specialist Clinics April 2000 - March 2001	Unpublished	
B	147	Royal Wolverhampton Hospitals NHS Trust (Rutter, M.)	1998	Clinical Physiotherapist Specialist in Orthopaedic Clinics April 1997 - March 1998	Unpublished	
B	357	Salvatori, P.	1997	Towards developing a flexible health workforce- Revue	<i>Canadian Journal of Occupational Therapy</i>	64: 47–52
B	48	Schleifer Taylor, J., McGlynn-Vittori, M. and Ellerton C	1997	A conceptual role-shift model: shaping and defining future physical therapy in hospital settings	<i>Physiotherapy Canada</i>	49: 171–7
B	254	Shacklady, C.	2003	The effect on pain of physiotherapist administered corticosteroid injection therapy	<i>WCPT Congress Barcelona</i>	
B	226	Shapiro, J. and Green, J.	1982	Effects of a family-oriented training experience on the role of the physical therapist	<i>Journal of Marital & Family Therapy</i>	8: 73–9
B	140	Shaw, A.	2001	The advanced practitioner in mammography	<i>Synergy</i>	<i>Synergy News, 24</i>
B	190	Somerset Coast Primary Care Trust	2001	Somerset Coast Primary Care Trust Pilot Musculo-Skeletal Care Pathway	Unpublished	
B	178	South Manchester University Hospitals NHS Trust (Lemon, J.N.S.)	1999	Orthopaedic Physiotherapy Practitioner Triage	Unpublished	
B	247	South Tees Acute Trust (Waugh, M.)	2002	An assessment of the current barium enema reporting practice of GI radiographers in South Tees Acute Trust	Unpublished	

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B	117	Soyars, T. and Lonchena, T.	2002	Step this way... The Next Step for Paramedics: Part 1, Jan. 2002	<i>Emergency Medical Services</i>	31: 10
B	215	St George's Healthcare NHS Trust	1995	Orthopaedic physiotherapy practitioner project. November 1993 - April 1995	Unpublished	
B	214	St George's Healthcare NHS Trust	1994	Regional Health Authority Trust waiting time initiative 1993/4. Orthopaedic physiotherapy practitioner	Unpublished	
B	189	Stenner, R.	1999	Back Triage Clinic Patient Satisfaction Survey	Unpublished	
B	188	Stenner, R.	1998	Development of a Back Pain Triage Clinic. Project for the ISM Consolidation Certificate in Management	Unpublished	
B	17	Stewart, M.	1998	Advanced practice in physiotherapy	<i>Physiotherapy</i>	84: 184-6
B	266	Swinburne, K.	1971	Pattern recognition for radiographers	<i>The Lancet</i>	March, 20: 589-90
B	156	Swindon and Marlborough NHS Trust	2001	Audit of Physiotherapy Screening Service at Whalebridge Surgery	Unpublished	
B	160	Swindon and Marlborough NHS Trust	2002	Physiotherapists in A & E	Unpublished	
B	157	Swindon and Marlborough NHS Trust	2001	Report on Extended Scope Physiotherapy Practitioner (ESP) Scheme in Orthopaedic Spinal Clinics	Unpublished	
B	198	Tallis, P.	2003	Extra scope physiotherapy - crossing boundaries	Unpublished	
B	253	The Chartered Society of Physiotherapy	2001	A clinical guideline for the use of injection therapy by physiotherapists	Briefing Paper	1-38
B	49	The Chartered Society of Physiotherapy	2002	Chartered Physiotherapists working as extended scope practitioners (ESP) Information paper number PA29	Briefing Paper	1-13
B	143	The Chartered Society of Physiotherapy	2002	Physiotherapy Briefing Paper Consultant (NHS): Role, Attributes And Guidance For	Briefing Paper	1-9

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Establishing Posts. Information paper PA 56						
B	225	The College of Radiographers	2001	Reporting by radiographers: a vision paper	Briefing Paper	
B	224	The College of Radiographers	1997	Reporting by radiographers: a vision paper	Briefing Paper	
B	184	The Royal College of Surgeons of England	1999	Assistants in Surgical Practice - A discussion document	Briefing Paper	2-12
B	219	The Royal Orthopaedic Hospital NHS Trust	2002	Back pain clinic patient satisfaction questionnaire	Unpublished	
B	121	Tomlin, P.	1994	Commentary on Paramedics -- the next generation [original article by Garza M appears in JEMS 1993;18(8):89-96]	<i>ENA's Nursing Scan in Emergency Care</i>	4: 18
B	233	Unsworth, A.	2001	Audit of the North PCG Triage Service: Six month audit (July-December 2000)	Unpublished	
B	234	Unsworth, A.	2001	Evaluation of the orthopaedic triage service for North Bury PCG	Unpublished	
B	168	Unsworth, A. and Bancroft, D.	2002	A prospective study to explore the efficacy of a primary care extended scope physiotherapy led orthopaedic medicine service	<i>HORIZON (ESP Newsletter)</i>	10, 6-7
B	2	Van Valkenburg, J., Ralph, B., Lopatofsky, L. <i>et al.</i>	2000	The role of the physician extender in radiology	<i>Radiologic Technology</i>	72: 45-50
B	177	Vink, H.	2000	South Manchester University Hospital NHS Trust orthopaedic physiotherapy practitioner trial	<i>HORIZON (ESP Newsletter)</i>	7, 2-3
B	394	Walker, L.O.	1999	The effect of direct access legislation on the strategic management of physical therapy organizations	Thesis	1-125
B	122	Walz, B.J.	1995	What's in a name?	<i>Journal of Emergency Medical Services</i>	20: 13-14
B	227	Ware, F., Garside, F., Robinson, P.J. and McWilliams, R.G.	1995	Bone scan reporting: a role extension for radiographers	<i>Nuclear Medicine Communications</i>	16: 228

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B	384	Warwick, J.	2000	Paramedic agrees with most of comments about prehospital care.	<i>British Medical Journal</i>	320:1005
B	246	Waugh, R.	2002	Accuracy inventory of the barium swallows and meals performed by Rosalind Waugh	Unpublished	
B	248	Waugh, R.	2002	Assessment of the reporting practice of Paediatric MCUGs undertaken by R. Waugh	Unpublished	
B	194	Weatherley, C.R. and Hourigan, P.G.	1998	Triage of back pain by physiotherapists in orthopaedic clinics	<i>Journal of the Royal Society of Medicine</i>	91: 377–9
B	93	Wetherall, N.	1971	The changing role of the radiographer	<i>Radiography</i>	37: 257–66
B	197	Wightman, P.	2001	Proposals for sustaining reduced outpatient waiting times	www.hunts-pct.nhs.uk/public_meetings/meeting_papers/2001_2002/december-2001/sustaining-reduced-outpatient-waiting-times.pdf	
B	154	Wilson, L.	2003	Annual Report of Physiotherapy Practitioner Service for Rheumatology 2002/2003	Unpublished	
B	239	Wilson, L.	2003	Annual report of physiotherapy practitioner service for orthopaedics 2002–2003	Unpublished	
B	85	Woods, E.N.	2000	The emergency department: a Pt--new opportunity for physical therapy	<i>Magazine of Physical Therapy</i>	8: 42–7
B	150	Worcester Royal Infirmary NHS Trust (Rawlings, M.)	1999	Physiotherapist Led Clinics - Patient Satisfaction Survey	Unpublished	
B	123	Yameen, J.M.	1994	Expanded scope of paramedic practice	<i>Emergency</i>	26: 64–5
B	95	Youngstrom, M.J.	2002	A mutual professional interest in dysphagia	<i>ASHA Leader</i>	7: 38
C	86	Bissell, R.A., Seaman, K.G., Bass, R.R. <i>et al.</i>	1999	Change the scope of practice of paramedics? An EMS/public health policy perspective	<i>Prehospital Emergency Care</i>	3: 140–9
D	100	Anon	1999	Study addresses expanded scope of practice for paramedics: authors suggest new guidelines	<i>EMS Insider</i>	26: 8
D	101	Anon	2001	What really happened in Red River?... expanded EMS (E-EMS) program in Red River,	<i>EMS Insider</i>	28: 6

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N.M						
D	326	Carlsson, J., Schuster, H.P. and Tebbe, U.	1997	Prehospitale thrombolytische Therapie bei akutem Myokardinfarkt [Prehospital thrombolytic therapy in myocardial infarction]	<i>Der Anaesthesist</i>	46: 829–39
D	200	Greene, J.	2001	AMA backs limits on scope of nonphysician practice	<i>American Medical News</i>	
D	201	Greene, J.	2000	Physician groups brace for allied scope-of-practice incursion	<i>American Medical News</i>	
D	88	Kuhr, S.	1995	Redesigning our future: a forum. Focusing the expanded scope	<i>Journal of the Emergency Medical Services</i>	20: 129–30, 132
D	304	National Heart Attack Alert Program NHAAP	1995	Staffing and equipping Emergency Medical Service systems: Rapid identification and treatment of acute myocardial infarction (Review)	<i>American Journal of Emergency Medicine</i>	13: 58–66
D	50	Professional Affairs Department C	1994	Physiotherapists working outside the scope of physiotherapy practice	<i>Physiotherapy</i>	80: 537
D	265	Simpkins, K.C.	1993	Why radiologists should perform barium enemas	<i>British Journal of Hospital Medicine</i>	50: 374–5
D	341	The Royal Orthopaedic NHS Trust	2002	Audit of GP's opinions on the management of low back pain	Unpublished	
E	306		1996	Study finds hurdles to expanded-EMS	<i>EMS Insider</i>	23: 4
E	208		2002	A prescription for the future	<i>Physiotherapy Frontline</i>	Boundaries supplement
E	245		2003	A spoonful of sugar	<i>OT News</i>	14
E	207		2002	Extending the prescribing debate	<i>Physiotherapy Frontline</i>	Boundaries supplement
E	9	Abeln, S.	1994	Stepping beyond traditional roles. Expanding opportunities for PTs and OTs in worker health have led to new questions about potential liability exposure	<i>Rehab Management</i>	7: 90–1

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E	98	Ad Hoc Committee on Scope of Practice in Speech-Language Pathology	2002	Scope of practice in speech-language pathology	<i>Communication Disorders Quarterly</i>	23: 77–83
E	92	American Speech-Language Hearing Association	1992	Sedation and topical anesthetics in audiology and speech-language pathology. Ad Hoc Committee on Advances in Clinical Practice. American Speech-Language-Hearing Association	<i>ASHL</i>	Supplement 41–2
E	108	Bailey, P.	1997	Professional. Ambulance paramedics -- an endangered species?	<i>Australasian Journal of Emergency Care</i>	4: 12–14
E	109	Besemer, C.	1996	Is paramedic scope expanding?	<i>Emergency</i>	28: 30–3
E	6	Blasini-Caceres, L. and Cook, A.B.	1997	Multi-competencies: a challenge for the allied health professions	<i>Puerto Rico Health Sciences Journal</i>	16: 67–75
E	4	Bluml, B.M., Copeland, L.R., LeTourneau, B. <i>et al.</i>	1999	Health care trends, Part 2 Thenew health care team. Panel discussion	<i>Physician Executive</i>	25: 67–75
E	285	Board of the Faculty of Clinical Radiology TRCoR	1996	Advice on delegation in departments of clinical radiology	<i>BFCR</i>	(96)4
E	271	Board of the Faculty of Clinical Radiology TRCoR	2002	Clinical radiology: a workforce in crisis	<i>BFCR</i>	(02)1: 1–20
E	264	Board of the Faculty of Clinical Radiology TRCoR	1998	Inter-professional roles and responsibilities in a radiology service	<i>BFCR</i>	(98)6: 1–9
E	270	Board of the Faculty of Clinical Radiology TRCoR	1999	Skills mix in clinical radiology	<i>BFCR</i>	(99)3: 1–6
E	80	Brealey, S., King, D. and Warnock, N.	2002	An assessment of different healthcare professionals' attitudes towards radiographers' reporting A&E films	<i>Radiography</i>	8: 27–34
E	312	Brindle, M.	1996	Staff Management: Debate intensifies over nonradiologists' roles. Extending duties of radiographers and nonmedical staff receives mixed responses in UK	<i>Diagnostic Imaging Europe</i>	74: 43–6, 74

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E	236	Chapman, A.H.	1992	Should radiographers perform barium enemas?	<i>Clinical Radiology</i>	46: 69–70
E	272	Chapman, A.H.	2003	The case for radiographers performing barium enemas	<i>British Journal of Hospital Medicine</i>	50: 370–4
E	171	Cohen, J.	2002	Exploring the issues of physiotherapists prescribing	<i>HORIZON (ESP Newsletter)</i>	10, 10–11
E	174	Cohen, J.	2002	Prescribing - your feedback	<i>HORIZON (ESP Newsletter)</i>	11, 12–13
E	128	Craven, C. and Barber, J.	1995	Role extension: where are we now?	<i>Radiography Today</i>	61: 12–13
E	89	De Lorenzo, R.A.	1995	Expanded-scope EMS education. A matter of degree?	<i>Journal of Emergency Medical Services</i>	20: 161–2
E	247	Ellis, B. and Kersten, P.	2003	A Delphi study of the role parameters and requirements of extended scope practice in hand therapy	<i>Report</i>	
E	257	Eyres, R.D., Henderson, I., Paterson, A.M. <i>et al.</i>	1997	A national forum for radiographic reporting: its importance and value	<i>British Journal of Radiology</i>	70: 106
E	112	Garnham, P.	1997	The only constant is change... seven professionals look at EMS present and peer into its future	<i>Emergency</i>	29: 36–41
E	90	Garza, M.A.	1994	Treatment without transport. Expanded-scope concept gains momentum	<i>Journal of the Emergency Medical Services</i>	19: 75–7
E	407	Gibler, W.B., Kereiakes, D.J. and Dean, E.N.	1991	Prehospital diagnosis and treatment of acute myocardial infarction: A North-South perspective	<i>American Heart Journal</i>	121: 1–11
E	386	Graham, C.	2000	Anaesthetists are not the only doctors who can use anaesthetic drugs	<i>British Medical Journal</i>	http://bmj.bmjournals.com/cgi/eletters/320/7240/1005/a#7341
E	405	Hall, R., Coffin, C. and Cyr, D.	1999	The ultrasound practitioner: a proposal.	<i>Journal of Diagnostic Medical Sonography</i>	15: 140–56

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				Response to the SDMS for the development of a middle care provider in ultrasound imaging		
E	387	Hauswald, M.	2001	A description of the Red River expanded EMS system: Its community health impact and lessons for the future. A report to the State of New Mexico Dept of Health	Report	
E	20	Hardy, M. and Persaud, A.	2001	The challenge of governance: Achieving quality in diagnostic imaging	<i>Radiography</i>	7: 159–63
E	289	Hatley, T., Ma, O.J. and Weaver, N. and Strong, D.	1998	Flight paramedic scope of practice: current level and breadth	<i>Journal of Emergency Medicine</i>	16: 731–5
E	91	Holdsworth, N.	1994	Expanded-scope paramedics. A nurse's perspective	<i>Journal of the Emergency Medical Services</i>	19: 92–3
E	406	Loughran, C.F.	1993	IV contrast injection by radiographers	<i>Clinical Radiology</i>	47: 366
E	134	McConnell, J.R.	2000	Radiographer plain film abnormality highlighting in Britain -- a review	<i>Canadian Journal of Medical Radiation Technology</i>	31: 199–206
E	297	McKenzie, G.A., Mathers, S.A., Graham, D.T. and Chesson, R.A.	2000	Radiographer performed general diagnostic ultrasound: current UK practice	<i>Radiography (London)</i>	6: 179–88
E	5	Meade, D.M.	1998	Expanded-scope practice: EMS at the crossroads of care	<i>Emergency Medical Services</i>	27: 39–40, 42, 44
E	400	Myers, R.B.H.	1998	Prehospital management of acute myocardial infarction: Electrocardiogram acquisition and interpretation, and thrombolysis by prehospital care providers	<i>Canadian Journal of Cardiology</i>	14: 1231–40
E	351	Newton, A.	2003	Laying the educational foundations for paramedic practice in the 21st century	Unpublished	
E	311	Newton, A., Elliott, S. and Howson, A.	2003	A discussion paper on the future of education, training and development for emergency ambulance staff, prepared for the Ambulance Education & Training Advisory Group of the ASA	Report	

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E	269	Nightingale, J.	2002	Radiographer reporting of gastrointestinal tract pathology: advancing practice to meet service needs	Conference proceedings	
E	383	Nesbitt, I.	2000	We do not need more intubationists	<i>British Medical Journal</i>	http://bmj.bmjournals.com/cgi/eletters/321/7260/572/a#9643
E	135	Oakley, J.	2001	Is trauma the place for role expansion?	<i>Synergy</i>	October, 20–1
E	116	Ostrow, L.S.	1996	Paramedic curriculum. Revision hotly debated	<i>Journal of Emergency Medical Services</i>	21: 40–1
E	75	Oxlade, L.	2001	Confusion reigns over the role of ESPs... conclude our coverage of this year's CSP Congress, 'Extending the boundaries', held in Birmingham	<i>Physiotherapy Frontline</i>	7: 14
E	262	Piper, K.	1995	Other publications and presentations: Clinical reporting in radiography	http://health.cant.ac.uk/allied-health-professions/research/clinical-reporting/clinical%20reporting.htm	
E	124	Price, R.	1997	Guiding the changing role of radiographers	<i>Synergy</i>	January, 10–11
E	376	Price, R., Miller, L. and Payne, G.	2000	Re-engineering the soft machine: the impact of developing Research technology and changing practice on diagnostic radiographer skill requirements	<i>Health Services Management</i>	13: 27–39
E	302	Read, S., Lloyd-Jones, M., Collins, K. <i>et al.</i>	2001	Exploring New Roles in Practice Report (ENRIP)	Report	1–303
E	408	Redmond, A.D.	1984	Paramedics in the United Kingdom	<i>British Medical Journal</i>	288: 622–3
E	10	Ritchey, F.J., Pinkston, D., Goldbaum, J.E. and Heerten, M.E.	1989	Perceptual correlates of physician referral to physical therapists: implications for role expansion	<i>Social Science and Medicine</i>	28: 69–80

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E	398	Roberts, G.	1998	Paramedics: should we be creating a new profession?	<i>Ambulance UK</i>	13: 7–8
E	84	Saunders, S.	2002	Praise for supplement which shows profession is extending its boundaries... supplement on extending traditional boundaries (distributed with the March 20 issue of Frontline)	<i>Physiotherapy Frontline</i>	8: 26
E	324	Saxton, H.M.	1992	Should radiologists report on every film?	<i>Clinical Radiology</i>	45: 1–3
E	352	Silver, G.	1966	New types of personnel and changing roles of health professionals	<i>Bulletin of the New York Academy of Medicine</i>	42: 1217–25
E	170	Smeatham, A.	2002	Physio prescribing - a review of the Crown Report	<i>HORIZON (ESP Newsletter)</i>	10, 8–10
E	250	Society of Radiographers	2000	Radiographers as prescribers - evidence required!	<i>Synergy News</i>	6: 6
E	120	Streets, P.	2001	Vision from afar	<i>Health Service Journal</i>	111: 31
E	141	The Chartered Society of Physiotherapy	2004	Information Paper PA 32. Chartered Physiotherapists and Insurance	Briefing paper	2–17
E	244	The Chartered Society of Physiotherapy	2003	Prescribing rights for physiotherapists: an information paper for members of the Chartered Society of Physiotherapy	Briefing paper	
E	183	Thomas, A., Barnes, D. and Holmes, K.	2000	Technical reporting: the way forward for radiographers	<i>Synergy</i>	April
E	314	Wallis, K., McKay, S., Brown, A. <i>et al.</i>	2003	Best practice review -emergency care practitioners	Unpublished	
E	82	Waters, A.	1999	Extending stress for physios	<i>Physiotherapy Frontline</i>	5: 19
E	18	White, P. and McKay, J.C.	2002	Guidelines and legal requirements which inform role expansion in radiography	<i>Radiography</i>	8: 71–8
E	380	Williams, M.P.	1996	Commentary: Skill mix for radiologists and radiographers	<i>The British Journal of Radiology</i>	69: 887–8
E	176	Withers, S.	2001	The law and the extended scope practitioner	<i>HORIZON (ESP Newsletter)</i>	8: 4

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ESP overall perspective code: A, evidence in support; B, descriptive but supportive; C, evidence not in support; D, descriptive, not supported; E, descriptive, mixed view

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