Discipline-specific competency-based curricula for leadership learning in medical specialty training: A critical review of the literature.

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ABSTRACT
Purpose

Doctors have a central role in leading improvements within healthcare systems. Leadership knowledge and skills are not inherent and need to be learned. General frameworks for learning medical leadership can guide curriculum development in this area. Explicit discipline-linked curricula provide context for learning to enhance specialty trainees' capability for leadership at all levels.

This review sets out to summarise the scholarly literature available around medical specialty-specific competency-based curricula for leadership in the post-graduate training space.

Methodology

A systematic literature search method was performed using the Medline, EMBASE and ERIC (education) on-line databases. Documents were reviewed for a complete match to the research question. Partial matches to the study topic were noted for comparison.

Findings

39 articles were retrieved in full text for detailed examination, of which 32 did not comply with the full inclusion criteria. Seven articles defining discipline-linked competencies/curricula specific to medical leadership training were identified. These related to the areas of emergency medicine, general practice, maternal and child health, obstetrics and gynaecology, pathology, radiation oncology and radiology. Leadership initiatives were critiqued in relation to key features of their design, development and content.

Practical Implications

There is limited discipline-specific guidance for the learning of leadership within medical specialty training programmes. The competency sets identified through this review may aid the development of learning interventions and tools of use in these and other medical disciplines.

Originality/Value

Findings provide a baseline for the further development, implementation and evaluation work required to embed leadership learning across all training programmes.

INTRODUCTION

Over several years, numerous 'calls to action' have been directed at doctors to strengthen their ability to lead improvements across increasingly complex health care systems (Dhaliwal and Sehgal, 2014; Khan, Ghatage and Craighead, 2016; McKimm and Swanwick, 2011; Prather and Jones, 2003; Wilkie, 2012). Most describe the need for junior doctors to undertake leadership learning as an integral part of specialty training (or 'residency' in North America) including trainees in general practice (Blumenthal, Bernard, Bohnen, and Bohmer, 2012; Garg, Niekerk and Campbell, 2011; Scheele, Novak, Vetter, Caccia and Goverde, 2014).

Despite this objective, practical progress towards embeding specific leadership learning within existing training programmes remains slow (Legerwood, 2015; Hadley, Penlington and Black, 2010). The focus on leadership as a core responsibility of all doctors is reflected by the mandate for all programmes in the UK to apply the Medical Leadership Competency Framework (NHS Institute for Innovation and Improvement, 2010) competencies to their programmes and to include a formally reported trainee-led quality improvement initiative as a compulsory requirement (Gamble and Vaux, 2014; Till, Banerjee and McKimm, 2015). In the US, the Accreditation Council for Graduate Medical Education (ACGME) is revising their common requirements to include the requirement for all residents to learn skills in quality improvement through participation in projects (Accreditation Council for Graduate Medical, 2017). This concept was also cemented within the 2015 version of the Canadian Medical Education Directive for Specialists (CanMEDS) (Frank, Snell, and Sherbino, 2015). As the most commonly applied educational framework for the design of specialty and residency programs globally, the renaming of the Manager role as 'Leader' in CanMEDS 2015 will likely be a catalyst for many programmes to examine how they might define and teach competencies within the Leader domain.

As for other CanMEDS 'non-medical expert' (or intrinsic) domains such as Communicator, Scholar or Health Advocate, ensuring learning in the Leader role may prove challenging compared to trainees acquiring specialty-specific Medical Expert competencies. One reason for this challenge is a relative lack of validated teaching and assessment tools for these intrinsic roles. In addition, there are many more competencies to be attained for Medical Expert. Supervisors' familiarity with, and focus on, traditional clinical competencies is inevitably greater.

In particular, supervisors may feel inadequately equipped to teach in the area of leadership. Generic leadership curricula or teaching, though helpful in principle, may seem to lack applicability to the day-to-day workplace or service commitments of the trainee (Czabanowska et al, 2013). High level learning frameworks such as LEADS (Dickson and Tholl, 2014) and CanMEDS 2015 (Dath, Chan and Abbot, 2015; Frank, 2015) outline capabilities or key competencies across the Leader Role, and are intended to guide development of more specific learning tools for particular healthcare environments. These frameworks have, and will continue to, trigger a new wave of curriculum development in medical leadership, aimed at increasing engagement and impact through explicit links to the medical discipline in question.

This review was conducted to inform advancement towards the design of such leadership curricula. An important principle is that this learning be integrated into specialty training programmes for all trainees. This learning is to be distinguished from: a) generalised leadership teaching 'tacked-on' to existing training programmes and/or, b) training directed only at select individuals considered to have 'leadership potential' (Stoll, Swanwick, Foster-Turner and Moss, 2011; Warren and Carnall, 2011). Hence, the aim of this study was to summarise the published peer-reviewed literature reporting the *definition,* and/or *application* of, discipline-specific competency-based leadership curricula in the medical specialty training space.

METHODS

Search Process

A literature search was conducted for relevant full-text articles in the English language published from January 2000 through to July 2017 using the on-line MEDLINE, EMBASE and ERIC (education literature) databases, via OvidSP. The start date for this search was chosen to capture publications within the era of competency-based medical education, also considering that a systematic review of physician leadership interventions identified only six reports between the years of 1950 and 2000 (Frich, Brewster and Cherlin, 2014). Text keyword searches were used initially including the words: 'leader/ship', 'physicians', 'residents', and 'medical education', to help identify relevant Medical Subject Headings from MEDLINE. Following this, a systematic in-depth search strategy was followed, firstly using MEDLINE, employing the terms (Leader/ship [Education] AND Internship and Residency OR Education, Medical, Graduate OR Education, Medical, Continuing OR Vocational Education/mt [Methods] OR Family Practice/or Specialization/or Physicians AND Teaching OR Curriculum [Education, Methods] OR Competency Based Education OR Models, Educational OR Teaching Materials. EMBASE was subsequently searched using the terms Leader/ship AND Medical Education AND Residency Education AND Clinical Competence/Professional Competence AND Curriculum Development/Curriculum. A total of 81 and 77 articles were identified from MEDLINE and EMBASE searches respectively.

For the search of the education literature database, ERIC, the ERIC thesaurus was used initially to find similar terms e.g. Curriculum -> Curriculum development, design, evaluation, -based assessment; Learning -> processes, strategies, theories; and Leadership -> quality, styles, responsibility. A detailed search followed using the terms Medical Education AND Higher Education AND Leadership -role or -training or -qualities AND Curriculum Development. This strategy initially identified 52 documents. A second search using Physician AND Medical Education AND Leadership AND Program Development revealed the same 52 items and no new references.

All identified items from these searches were examined by review of full titles and abstracts, and those still potentially matching the research question were retrieved in full-text versions for closer evaluation. Reference lists within retrieved articles

were manually searched to identify any additional studies that may have been overlooked. Reasons that retrieved documents did <u>not</u> match the research question criteria were recorded and grouped into categories according to reason(s) for exclusion.

Statement of Research Question

What scholarly work has been published around the development of medical discipline-specific competencies/curricula to guide acquisition of leadership knowledge and skills within medical specialty (residency) training programmes?

Inclusion and Exclusion Criteria

For the purposes of this review, competencies (also termed learning objectives or outcomes) were defined as being clearly articulated items of knowledge, skills, attributes or behaviors to be attained by the learner. 'Curriculum' was defined as a set of competencies intended to guide learning, whether or not a complementary learning program and/or assessments had been designed or were described. The articles of interest were those that were explicit in stating that the curriculum was directed at leadership learning, and linked to known leadership concepts. Where a programme or curriculum was described that purported to teach leadership, at least some subset of the underlying competencies had to be shown in the article. Alternatively, the report needed to provide an accessible reference in which relevant competencies were defined. The participants needed to be learners during medical specialty training, whether this commenced straight after medical school (such as in Canada and the US) or some years after graduation (for example in the United Kingdom, Australia and New Zealand). Primary care/family medicine/general practice training were considered a 'specialty' for the purpose of this study. The leadership curricula sought were those that had a discipline-specific focus. To be included in this review, the curriculum (or training intervention linking to such a curriculum) needed to be integrated or intended for integration across the entire cohort of trainees within a particular discipline, rather than being applied to a select

group, for example, 'potential' leaders. Similarly, the curricula of interest were distinguished from one-off teaching workshops, for instance, those run externally to the usual training environment.

Articles were excluded if they reported curricula or programmes for doctors solely dealing with practice- or career management, or administration, without reference to how these linked to enhancing personal leadership qualities, and/or leadership knowledge and skills to apply at local, systems or organizational levels. Reports of learning interventions dealing <u>solely</u> with quality processes or improvement initiatives were similarly excluded. Papers primarily dealing with undergraduate students, fully qualified specialists, mixed health professional groups with a small minority of doctors or training at executive level were also out of scope. Leadership programmes, curricula or frameworks of a more general nature, i.e. not tailored towards trainees within specific medical disciplines, were also excluded.

RESULTS

Eighty-one, 77 and 52 'articles' were identified through the MEDLINE, EMBASE and ERIC searches respectively, yielding a total of 210 documents. On review of full titles and abstracts on-line, 24, 13 and 2 unique items remained from these searches respectively, leaving 39 papers of potential relevance to the research question.

The most common reasons for removal in the abstract review phase were that reports primarily or only dealt with:
- non-medical (physician) health professionals – nursing, dentistry, other allied health professionals, veterinary practitioners, mixed disciplines
- medical students
- senior management, executive or senior physician leadership
- teaching of professionalism or communication skills, not specific to leadership
- conference presentations lacking adequate detail

The resulting 39 articles warranting full-text retrieval all made reference to leadership curricula or programmes developed for one or more specific medical disciplines. On review of the full texts, five letters/brief commentaries were deleted. One article on the topic of women and medical leadership was removed as was another reporting an interdisciplinary programme of leadership education in adolescent health, which included a small minority of medical residents (Robbins and Rickert, 2016). This left 32 articles potentially matching the research criteria.

The medical disciplines represented in the 32 papers were: anaesthesia (Edler, Adamshick, Fanning and Piro, 2010; Lattore and Lumb, 2005), emergency medicine (Thoma et al., 2015; Uddin, Barnett, Parker, Links and Alexander, 2008) dermatology (Baird, Soldanska, and Anderson, 2012), general practice (Hadly, 2010; Gillam and Khanchandani, 2013; Khanchandani and Gillam, 2012; Patterson, Godden, Rughani and Smithson, 2013), internal medicine (Angus, 2009; Hunziker, Tschan, Semmer and Marsch, 2013; Moore, Wininger, and Martin, 2016), obstetrics and gynaecology (Scheele et al., 2014; Steinhardt, 2015), pathology (Brimhall et al, 2007; Hemmer et al., 2007), psychiatry (Garg et al., 2011; Malloy, Butt and Sorter, 2010; Stergiopolous, Maggi, and Sockalingam, 2009), paediatrics (Goodyear, Lakshminarayana, Wall, and Bindal, 2015; Hicks, P., Schumacher, Guralnick, Carraccio and Burke, 2014; Kuo, Thyne, Chen, West and Kamei, 2010; Lakshminarayana, Wall, Bindal and Goodyear, 2015), public health (Foster et al., 2008; Smith, 2015), maternal and child health (Department of Health and Human Services, 2009; Humphreys et al., 2015), medical administration (MacCarrick, Owen, and Hearder, 2014), radiation oncology (Turner et al., 2017), radiology (Brandon and Mullen, 2013; Donelly, 2015; Lexa, 2011), and surgery (Awad, Hayley, Fagan, Berger, and Brunicardi, 2004; Jaffe, Pradarelli, Lemak, Mulholland and Dimick, 2016; Ledgerwood, 2015; Patel et al., 2010). On detailed reading of these 32 articles, 25 did not fully address the research question.

Figure 1 summarizes the process of the literature searches, including the numbers of articles identified at each step.

Figure 1 about here – Diagram of search and review process

Table 1 shows the major reason(s) that 25 retrieved full-text documents did not entirely match the review criteria, despite being identified through searches as potentially dealing with leadership learning in medical specialty training.

Table 1 – Reasons research question not met

Research question criterion not met by the curriculum, study and/or article	References
Not applied predominantly or exclusively to the period of specialty training (residency)	Angus, 2009; Awad et al., 2004; Block et al., 2007; Brimhall et al., 2007; Frich et al., 2014; Lattore and Lumb, 2005; Malloy et al., 2010; Smith, 2015; Stelnick et al., 2008.
Explicit competencies or learning objectives not stated (nor location given to find these if they are articulated elsewhere)	Angus, 2009; Awad et al., 2004; Baird et al., 2012; Donnelly, 2015; Edler et al., 2014; Frich et al., 2014; Hunziker et al., 2013; Lattore and Lumb, 2005; Ledgerwood, 2015; Malloy et al., 2010; Moore et al., 2016; Patel et al., 2010; Prather and Jones, 2003; Steinhilber and Estrada, 2015.
Competencies and/or program reported are not discipline- or specialty-specific	Baird et al., 2012; Block et al., 2007; Brimhall et al.,2007; Hadley et al., 2010; Moore et al., 2016; Patel et al., 2010; Smith, 2015; Uddin et al., 2008.
Leadership learning is not the major goal of learning	Brandon and Mullen, 2013; Brimhall et al., 2007; Hicks et al., 2014; Hunziker et al., 2013; Stergiopolous et al., 2009.
Intervention not intended for, or applied to, the whole trainee/resident cohort (i.e. selects 'potential' leaders)	Kuo et al., 2010; Smith, 2015.
Does not make explicit links to leadership in clinical practice (rather than training for administrative or management roles)	MacCarrick et al., 2014; Patel et al., 2010; Stelnick et al., 2008.

The seven articles identified as meeting the full review criteria through this process are summarised in Table 2. The column headings reflect features of each curriculum including whether the content addressed certain aspects of leadership learning. These aspects (in the three right-hand columns) were: a) basic principles of leadership theory/styles; b) quality improvement skills and c) team-based leadership skills, and were highlighted as being central elements of established healthcare leadership frameworks (Dickson and Tholl, 2014; Frank et al., 2015). The degree of team-based focus and/or learning for each curriculum (final column Table 2) was of particular interest as an indicator of either deliberate or unconscious alignment with

the concepts of 'distributed' or 'shared' leadership and/or the educational principles of inter-professional or inter–disciplinary learning (see Discussion).

Table 2 about here

(Note: table 2 not inserted here as it lends itself to landscape orientation
- see separate file)

The seven articles matching the research question reported curricula which varied according to country, discipline, development process and extent (i.e. progressed to the point of defining learning methods or not), the nature of the learners and content.

Thoma at al (2015) developed a detailed competency set for administration and leadership specific to emergency medicine trainees through a two-round Delphi consensus process. These competencies were organised across all seven CanMEDS domains. More recently, Turner et al (2017) conducted a two-round international Delphi consensus project aiming to define a globally applicable leadership curriculum linked to the CanMEDS Leader role for radiation trainees/residents. Lexa's article outlines a project commissioned by the American College of Radiology (ACR) for improving leadership (and management) for radiologists across the country (Lexa, 2011). The resulting curriculum was identified elsewhere (Radiology Leadership Institute, ACR, 2017; Sherry, 2011). Khanchandani and Gillam (2012) reported how reforms of the Medical Research Council General Practice (MRCGP) curriculum (Royal College of General Practitioners, 2017) drew on the MLCF in articulating leadership and management learning outcomes to strengthen their programme. Hemmer and colleagues (2007) in the US identified a gap in management and leadership training for pathologists and set out to build a practical integrated course based on ACGME learning outcomes as they linked to pathology and laboratory services in patient care.

Steinhardt's paper was unique in that it described a midwifery-designed and led teaching intervention for resident doctors in obstetrics and gynecology (O and G) (Steinhardt, 2015). This program matched specialty-relevant team-based learning to

ACGME principles, including the development of leadership skills from 'novice to expert level', as articulated in the 'O and G Milestone Project' (O and G Milestones Project, 2014). Humphreys and co-authors described work with a more cross-professional focus for leadership training in the area of child and maternal health (Humphreys et al., 2015). This article was included in this review as the majority of learners were specialists in training including in paediatrics and public health.

All curricula described in the seven articles identified in this review included components of 'systems thinking' (Savigny and Adam, 2009) and half of them explicitly included quality improvement knowledge and practice. With the exception of Thoma et al and Turner et al's papers, however, the complete competency sets were not presented so that it was not possible to undertake a detailed comparison of all curriculum components. Of particular interest, the Thoma et al, Hemmer et al and Lexa et al papers did not explicitly highlight the issue of self- awareness or self-reflection (as components of overall 'emotional intelligence' (Mintz and Stoller, 2014) whereas Steinhardt, Humphreys et, Khanchandani et al and Turner et did.

DISCUSSION

There is emerging evidence that strong leadership, worker engagement and effective teamwork lead to better patient outcomes (West, Lyubovnikova, Eckert and Denis, 2014). Thus, the ability to foster positive relationships across the team is key to successful leadership in healthcare. This engagement enables the initiation and implementation of quality improvement processes through functional inter-professional team activity at multiple levels (Dickson and Tholl, 2014). However, without the core skills, knowledge and personal behaviours to operate well within such teams, doctors are not readily equipped to lead (or follow) effectively. Competencies linked to leadership knowledge, skills and attitudes need to be clearly articulated to guide learning in this area. Medical specialty training curricula not only provide the vehicle for *defining* learning content but create positive links to assessment and feedback which motivate individuals to learn. Although the research question was deliberately limited to leadership curricula for *doctors in specialty*

training, the actual attainment and demonstration of leadership competencies must inevitably occur in the context of broader multi-professional teams.

The first step in ensuring that learning in medical leadership occurs within training of all qualified specialists (including in general practice) is to explicitly state the requirement for this to occur. One such statement, for instance, has been made through the change of Manager to Leader within the CanMEDS curriculum framework (Dath et al., 2015). In the United Kingdom, the adoption of a mandatory quality improvement project for all trainees, aligned with the Medical Leadership Competency Framework (MLCF) domains helped spell out this requirement (NHS Institute for Innovation and Improvement, 2010). In the United States, the Accreditation Council of Graduate Medical Education (ACGME) has endorsed learning of leadership in residency through national leadership programs for chief residents and somewhat less overtly within the six domains of ACGME domains of competency currently being revised (Accreditation Council for Graduate Medical Education, 2017).

Despite being crucial for guiding curriculum development and learning in the area of leadership, general frameworks and tools may be too generic to engage teachers and potential learners at a practical level (Czabanowska et al, 2013; Bolden and Gosling, 2013). It is by no means a trivial task to achieve buy-in of training organisations and/or teachers, yet alone learners, who are dealing with already busy training programs. On the other hand, when leadership concepts are adapted to link clearly to the context of the day-to-day workplace and the needs for that particular specialty, the value of this learning becomes apparent, and may be viewed in a more positive manner (McGonagill and Pruyn, 2010).

For this reason, it is anticipated that there will be many groups aspiring to develop sets of leadership-related competencies or learning objectives (as well as methods for learning and assessing these) specific to, and integrated within, specialty training programmes. This review aimed to draw together the published literature on this topic to guide others in specialty-specific leadership curriculum development. The

effect of these curricula on learning and performance, however, was outside the research question. For four of the seven curricula identified in Table 2, it would be too early to measure the impact of the work described, even if such an evaluation is intended. Evaluating such developments represents a challenge for the future.

Two published systematic reviews relate to the subject of the current study. Straus and colleagues found that based on published evaluations of leadership programmes for physicians, most had at best a modest impact on outcomes for leadership 'success' using measures recognised by academic medical centres (Straus, Soobiah, and Levinson, 2013). Frich et al identified 35 leadership programmes designed specifically for doctors at various levels (Frich, Brewster and Cherlin, 2014). They concluded that there were a number of gaps in the area of leadership learning including a focus on the importance of gaining self-awareness, the value of interactive and cross-professional team activities, and the lack of reference to wider system-level outcomes, rather than those related to individual participants.

Of note, an article which was close to meeting the full review criteria for this study but which was eventually discarded, was around work done by MacCarrick and others defining a CanMEDS-based curriculum competency set for trainees in the Royal Australian College of Medical Administrators (RACMA) program (MacCarrick, Owen and Hearder, 2014). Although this group does represent a discrete specialty stream in Australia, by definition it comprises doctors who are undertaking management training for senior administrative and executive roles, 80% of whom are already specialists in a variety of clinical fields. Therefore, it was not considered to comply with the concept of 'little "l" leadership', that is, training intended for all trainees across and within medical specialist programmes. However, the notion of 'professionalising' leadership of doctors by standard setting and benchmarking of medical leadership quality within and across organisations is growing in favour (Faculty of Medical Leadership and Management, 2016). This will likely reinforce the importance of leadership training as a core component of learning for doctors at all levels.

It is now widely accepted that all aspects of competency-based training programmes should be built on sound pedagogical theory and the best available evidence. In the same way, 'training' in medical leadership requires a systematic and logical development approach, under-pinned by leadership theory and the evidence supporting methods for learning, both within and outside the area of healthcare. In leadership for the healthcare setting, the modern notions of transformational leadership (involved with shaping change) and 'shared', 'distributed' or 'collective' leadership (West et al., 2014) through effective front-line teams intersect with established learning theory and evidence in adult education. Of strong relevance in the current context, is the theory of social constructivism, or learning through building knowledge 'blocks' through individual experience and context, affected by social interactions and relationships (Mann, 2011). Doubtless the way forward will be to enhance effective team performance through strengthening skills within interdisciplinary and inter-professional learning environments. The focus in this study on leadership by *doctors* is by no means intended to undermine the importance of breaking down traditional hierarchies to ensure that all health professionals are equipped to lead in the appropriate context (Meisinger and Wohler, 2016).

The main limitation of this review is that much of the work in the area of interest is located in the 'grey literature'. It may be that there are other well-developed curricula including teaching interventions available on-line or already applied to specific training programmes. However, ensuring that others can learn and build on previous experience in a scholarly manner requires that educators strive to publish their work in the peer-reviewed literature. Another possible limitation is that as no universally accepted definition of leadership exists, there could be other reports involving elements of learning relevant to 'leadership' that have been overlooked in this review process.

CONCLUSION

This critical review of the literature around work reporting discipline-specific competency-sets or curricula for leadership learning for doctors within specialty training programmes identified only seven articles fully meeting the research criteria. Variations between these reflect the uncertainties around the best approach for learning in this area. This review was not able to cast light on a preferred method for learners to acquire competencies in this area or to help prioritise certain leadership topics over others. Evaluation to assess the impact of discipline-tailored curricula over more generic learning statements and programmes is required. Interventions need to be appraised in terms of engagement of teachers and learners as well as the short and longer-term impact on learner behaviour. Although it seems logical that relevance and influence might be improved by such initiatives, as for all curriculum developments it will be important to test this premise rigorously. Studying the effects of such interventions on patient-focused outcomes within the wider healthcare system must remain on the agenda as an educational priority.

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