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## Physicians in the management and leadership of health care: A systematic review of the conditions conducive to organizational performance

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Conditions affecting medical leadership

**Title:**

Physicians in the management and leadership of health care: A systematic review of the conditions conducive to organizational performance

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## Abstract

**Introduction:** The influx of management ideas into health care has triggered considerable debate about if and how managerial and medical logics can co-exist. Recent reviews suggest that clinician involvement in hospital leadership can lead to superior performance.

**Objective:** To systematically explore the conditions instrumental for medical leadership to have an impact on organizational performance.

**Methods:** We searched PubMed, Web of Science, and Psychinfo for peer-reviewed, empirical, English language articles and reviews published between January 1, 2006 and August 12, 2018. We performed a thematic synthesis through inductive line-by-line coding of the included studies.

**Results:** The search yielded 1447 publications, of which 62 were included. Three major themes were identified that described a movement 1. From medical protectionism to management through medicine, 2. From command and control to participatory leadership practices, and 3. Organizational practices to support incidental versus willing leaders. Based on these themes, the authors developed a model to depict conditions that facilitate or impede the influence of medical leadership through a virtuous cycle of management through medicine or a vicious cycle of medical protectionism.

**Conclusions:** This review helps individuals, organizations, educators, and trainers better understand how medical leadership can be both a boon and a barrier to the performance of health care organizations. In contrast to the conventional view of conflicting logics, medical leadership would benefit from a more integrative mental model of management and medicine. Nurturing medical engagement requires participatory leadership enabled through long-term investments at the individual, organizational, and system levels. These combined efforts will

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Conditions affecting medical leadership

enable a shift to new leadership paradigms suitable to the complexity of health care, and establish conditions favorable for large-system transformation and health care reform.

**Key words:** medical leadership; literature review; hospital performance; physician executive

### **Strengths and limitations of this study**

- While previous literature reviews have established a correlation between physicians in leadership roles and organizational performance, this is to our knowledge the first review that seeks to explore what contributes to that link.
- The review expands on the typically quantitative focus of systematic reviews by providing a thematic synthesis of fifty-five empirical studies and seven literature reviews.
- A model is presented that depicts a virtuous cycle of management through medicine and a vicious cycle of medical protectionism.
- This review is limited by the quality and heterogeneity of the included studies.
- While plausible correlations between conditions and performance outcomes are explored, to establish causality requires study designs that can determine the strength of the relationships.

Conditions affecting medical leadership

## INTRODUCTION

Organizational research has established a link between leadership practices and performance.[1] As health care searches for its success formula, the impact of medical leadership on performance has become an increasingly relevant research objective. The two most recent systematic reviews on the subject suggest that clinician involvement in hospital leadership can be linked to superior performance.[2,3] The inclusion of clinical leaders (primarily physicians) in senior management roles has a positive impact on care quality, management of financial and operational resources, and social performance, albeit a few studies showed a negative impact on the latter two.[2] Additional reviews have found effects on staff satisfaction, retention, performance, and burnout;[4–6] psychological safety, respect, and shared goals;[7] approval and support of political reforms[8]; and the adoption of information technology.[9]

While the reviews describe the challenge to discern why medical leadership makes a difference, Sarto and Veronesi,[2] hypothesize about possible mediating mechanisms (Figure 1).

<<<Insert Figure 1 here>>>

The core explanation proffered is centered on the individual's credibility and competence generated by a medical degree.[2] However, two observations can be made, both of which warrant a further qualitative exploration. The first is that the mediating mechanisms are drawn from authors discussions of their quantitative results rather than research designed to specifically explore the mechanisms behind the connections. The second is that the mediating mechanisms exist within a context,[10] i.e. there are conditions that influence to what extent medical competence and credibility can benefit organizational performance. The aim of this

1 Conditions affecting medical leadership

2  
3 study is therefore to systematically explore the conditions instrumental for medical leadership  
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5 to have an impact on organizational performance.  
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## 8 **METHODS**

### 9 **Review protocol**

10  
11  
12 This systematic literature review is a thematic synthesis of empirical studies and literature  
13  
14 reviews. Thematic synthesis was chosen in order to expand the traditionally quantitative focus  
15  
16 of systematic reviews with a method that accommodates a diversity of study designs, provides  
17  
18 policy-makers and practitioners more nuanced evidence for a complex question,[11] and  
19  
20 enables to develop insights beyond those of the original studies through an higher-order  
21  
22 thematic structure.[11,12] Given its qualitative nature, it was guided by the ENhancing  
23  
24 Transparency in REporting the synthesis of Qualitative research (ENTREQ) statement  
25  
26 (Appendix 1).[13] Patients or the public were not involved in the design, or conduct, or  
27  
28 reporting, or dissemination plans of our research.  
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### 36 **Search strategy**

37  
38 The strategy was developed with assistance from a professional research librarian. We  
39  
40 conducted a comprehensive search for scientific articles published between January 1<sup>st</sup> 2006  
41  
42 and August 12<sup>th</sup> 2018. We limited the search timeline to capture contemporary evidence in the  
43  
44 light of recently established correlations between medical leadership and performance.[2] We  
45  
46 defined this as the last decade of publications. As the study originally commenced in 2016, we  
47  
48 updated the search on 12<sup>th</sup> of August 2018. Boolean searches were performed in  
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50 Medline/PubMed, Web of Science, and Psychinfo. As the focus was on physicians, other  
51  
52 health care databases such as CINAHL, were excluded. To identify a wide range of studies,  
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54 all possible truncated combinations of keywords and MeSH terms such as  
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57  
58 “clinical/medical/physician/doctor management/leadership”, “organization and management”,  
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1 Conditions affecting medical leadership

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3 “physician executive”, “performance”, and “quality of health care” were used. The search was  
4  
5 complemented with additional articles from the reference lists of the articles selected for full-  
6  
7 text review.  
8

### 9 10 **Study selection**

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12 Aggregated search results were imported to the Mendeley reference management system  
13  
14 where duplicates were removed. Remaining records were subjected to three rounds of  
15  
16 screening. Inclusion criteria were that articles were peer-reviewed, empirical studies or  
17  
18 literature reviews, and in the English language, published between January 2006 and August  
19  
20 2018 which focused on physicians in the leadership and management of health care. We  
21  
22 included literature reviews to capture patterns across a wide span of studies, i.e. we did not  
23  
24 use these to assess the relative importance of individual factors, but rather to identify relevant  
25  
26 themes in the literature.  
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30  
31 Exclusion criteria were publication prior to 2006, non-English language, not empirical or  
32  
33 literature reviews, non-peer-reviewed, did not include physicians as study participants, and  
34  
35 were reports on care and treatment planning for specific medical conditions. These inclusion  
36  
37 and exclusion criteria were applied, when the first author first screened all titles and key  
38  
39 words, and then the remaining abstracts. Then, all authors screened the records eligible for  
40  
41 full text review and applied further exclusion criteria: full-text not available; purely  
42  
43 quantitative reports on organizational performance outcomes or leadership development  
44  
45 evaluations; not addressing physicians in the leadership and management of health care (i.e.  
46  
47 not about their role in quality improvement, coordination of care, resource management, team  
48  
49 leadership, change management, policy reform, or descriptions of their individual experiences  
50  
51 in such roles). Any discrepancies regarding inclusion were resolved through consensus. Due  
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53 to the diversity of study designs and contexts, and the intention to capture a thematic account,  
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1 Conditions affecting medical leadership

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3 the quality of individual studies in terms of strength of evidence was not assessed as per  
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5 established convention.[13,14]  
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### 8 **Data extraction and analysis**

9  
10 Data on general characteristics included type of study design, country of origin, setting, and  
11  
12 study participants. Data extraction and analysis followed an inductive approach. The results  
13  
14 sections were read line-by-line to identify meaning units describing the conditions  
15  
16 instrumental to medical leadership. The first author summarized these as codes, which were  
17  
18 then organized into descriptive themes by all authors.[12] Based on these themes, the authors  
19  
20 developed a preliminary model (analytical themes) to depict conditions that facilitate or  
21  
22 impede physician leadership.[12] The model was tested for face validity and refined to  
23  
24 improve clarity after discussions with practicing clinicians and managers in our graduate and  
25  
26 continuing professional development courses and at conferences in Sweden and Europe. Data  
27  
28 extraction and analysis was performed in NVivo qualitative data analysis software; QSR  
29  
30 International Pty Ltd. Version 10, 2012.  
31  
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### 37 **RESULTS**

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40 The initial search identified 1447 records (PubMed 437, Web of Science 896, and Psychinfo  
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42 114). After removing duplicates and adding 26 records identified from reference lists, the tally  
43  
44 was 1424 records. Titles and key words were screened which yielded 367 records. After their  
45  
46 abstracts were screened, 189 articles remained. After screening the full texts, 62 articles were  
47  
48 included in the thematic synthesis (Figure 2). Of these, fifty-five were empirical articles  
49  
50 (qualitative, quantitative or mixed methods designs) and seven literature reviews.  
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55 <<<Insert Figure 2 here>>>

Conditions affecting medical leadership

### General characteristics

Most studies were conducted in the UK (n=17) and the US (n=14), in hospital settings (n=40), and focused on senior managers (n=14). Qualitative designs were used in 23 studies, followed by 12 surveys and 10 case studies (Figure 3). The empirical studies together reported on 906 hours of observations, 1417 interviews, and 22643 survey responses. A detailed overview of the included studies is provided in Appendix 2.

<<<Insert Figure 3 here>>>

### Conditions instrumental for medical leadership to have an impact on organizational performance

Three themes were identified: From medical protectionism to management through medicine; from command and control to participatory leadership practices; and organizational practices to nurture willing vs. incidental leaders (Table 1). References to the relevant articles are provided in the text.

Table 1 Descriptive themes, categories and sub-categories identified through the thematic synthesis.

	IMPEDING CONDITIONS	FACILITATING CONDITIONS
<b>Theme 1</b>	<b>From medical protectionism to management through medicine</b>	
<i>Category</i>	<i>Medical protectionism</i>	<i>Management through medicine</i>
<i>Sub-category</i>		
Motivation to lead	Safeguard physicians' role, identity & influence	Ensure that management decisions have a positive impact on care and clinical outcomes
Perception of management	Going over to the "dark side", concerns about losing credibility among clinical peers	A collective decision-making process where expert knowledge is integrated through openness, trust, respect, and cooperation
View of oneself as a manager	Struggling heroes "working against the odds or as righteous victims struggling in the face of adversity"	Knowledge brokers who see the opportunity for management to enhance clinical identities

Conditions affecting medical leadership

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4	Role of managerial strategies	To protect autonomy and avoid control, i.e. modernized professionalism	Productivity as individualized professional duty that builds on physicians' inner drive to improve care, i.e. new professionalism
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8	Outcome of managerial strategies	Disengagement from difficult interactions with colleagues and patients	Engagement across professions that mediates status differences and facilitates knowledge-sharing
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11			
12	<b>Theme 2</b>	<b>From command and control to participatory leadership practices</b>	
13			
14	<i>Category</i>	<i>Command and control</i>	<i>Participatory leadership practices</i>
15	Sub-category		
16			
17	Organizational culture	Bureaucratic, policy-driven and hierarchical; poor communication, lack of support, incompetence	Inclusive, soliciting input, participatory decision making, shared vision
18			
19	Performance measurement	Externally imposed performance measures with no authority, staff, budget, time, etc.	Co-designed performance measures to align quality and safety agendas
20			
21			
22	Outcome	Lack of ownership and trust, values conflict, sense of powerlessness, focus on compliance	Autonomy, meaning, local improvement, better management-clinician relationships, managerial job engagement and self-efficacy
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29			
30	<b>Theme 3</b>	<b>Organizational practices to support incidental vs. willing leaders</b>	
31			
32	<i>Category</i>	<i>Practices that support incidental leaders</i>	<i>Practices that support willing leaders</i>
33	Sub-category		
34			
35	Recruitment	Informal networks, <i>ad hoc</i> processes, persuasion, without explicit selection criteria or expectations	Formalized, with explicit expectations to match strategic context, early identification of leadership potential, considers demographics and self-efficacy
36			
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42	Top management support	Remind of responsibilities by nagging and arguing, crowding agendas with operational matters	Acknowledge and engage medical expertise and academic competence, foster collaborative relationships, effective communication and proactive decision-making, remove barriers such as lack of reward and recognition
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49	Strategic leadership development	Expected to learn management on their own and on the fly. Leadership development focused on individuals, divorced from everyday challenges and rarely followed up with opportunities for practice	Starts early, occurs on all levels, benefits patient care and system level challenges not just individuals, and is integral to strategic development
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1 Conditions affecting medical leadership

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3 From medical protectionism to management through medicine

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5 Variations in the perceptions of management, views of oneself as a manager, motivation to  
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7 lead, and the role and outcomes of managerial strategies can be described as medical  
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9 protectionism or management through medicine.  
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13 *Medical protectionism*

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15 Managerial and clinical logics are challenging for physicians to reconcile.[15–18] Medical  
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17 leaders are perceived to occupy a no-mans-land,[19] often not meeting the expectations and  
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19 authority vested in them.[20] Many are concerned with losing their credibility among their  
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21 peers and becoming outsiders,[21] with management referred to as the “dark side”.[15,17,22]  
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23 They perceive themselves as struggling heroes, “working against the odds or as righteous  
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25 victims struggling in the face of adversity”.[15]  
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30 Physicians’ motivation to be involved in leadership is to safeguard their autonomy, identity,  
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32 status, influence, and to resist changes tied to their specialty independent of the organization’s  
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34 needs and goals. They adopt or adapt managerial practices and accept managerial roles as a  
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36 custodial strategy, referred to as “paradigm freeze”.[6,23–26] This “modernized  
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38 professionalism” creates new forms of self-regulation and self-management, such as resisting  
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40 managers’ attempts to control patient safety programs; focusing on minimum necessary  
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42 reporting; selectively participating in managerial meetings; sending out last minute meeting  
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44 agendas to limit managers’ participation; or concealing the significance of certain  
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46 decisions.[24,27] As clinical managers appear to adhere to managerial control, their clinical  
47  
48 identity and professional objectives remain unaffected, i.e. loyalty to the profession has  
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50 trumped loyalty to the organization.[19,24] These dynamics result in personal struggles  
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52 causing clinicians to disengage from difficult interactions with colleagues and patients, and  
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54 the medical decision-making suffers.[28] When ignoring as opposed to engaging with these  
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56 aspects of professional cultures, professional resistance to change can be triggered.[29]  
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1 Conditions affecting medical leadership

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3 *Management through medicine*

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5 Studies suggest an opportunity to move beyond an adversarial view of management and  
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medicine.[24] Knowledge brokering as described in the concept of hybrid managers can be replaced with an integrative mindset where management is intertwined with expert knowledge through openness, trust, respect, and cooperation, and understood through its impact on clinical practice,[16–18,24,30,31] so that medical leaders can enhance their physician identities by bridging management and medicine.[22]

As physicians are driven by a desire to make a difference, improve, and innovate and want to be engaged and become good leaders,[32,33] managerial discourse should build on their inner drive, resonate with their mental models, and be anchored in quality improvement, i.e. a “professional path”.[18] This “new professionalism” identifies productivity as a route to self-governance where medical leaders achieve superior performance by defining their own and other’s roles, connect staff, and focus on goal attainment.[18,34–37]

Management through medicine has been strengthened by new roles for physicians (e.g. pathway coordinators and hospitalists) and multi-professional, team-based service delivery approaches which mediate status differences and facilitate knowledge-sharing across professions.[16,32,38,39] These allow physicians to enter managerial work earlier in their careers,[20] and thereby improve their managerial capabilities, including building their social capital and developing different perspectives on problems and solutions.[16,18] While some leaders feel it is inappropriate to retain clinical commitments due to a risk of being seen as partisan in relation to a specialty or service,[22] most choose to continue clinical practice to maintain a sense of belonging, enhance legitimacy, and provide inspiration and insights into daily work, but also to keep the option of returning to clinical work in case of failure as a leader.[22,31,33,40]

1 Conditions affecting medical leadership

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3 As discourse has not only a descriptive but also a performative role, there has been a  
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5 conscious move to replace the managerial discourse with a leadership discourse.[35,40,41]

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7 The term “medical leadership” resonates better with professional groups, can remove tensions  
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9 between operational requirements and visionary aspirations, and potentially influence new  
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11 work practices.[35,41]  
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18 From command and control to participatory leadership practices

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20 Organizational attributes, strategies in performance measurement and their outcomes can be  
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22 described either as management through command and control or as participatory leadership  
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24 practices.  
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28 *Management through command and control*

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30 Bureaucratic, policy-driven, and hierarchical workplaces with poor organizational  
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32 communication practices, lack of support for innovation, conflicts, and incompetence hinder  
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34 physician engagement.[32,42–44] Matrix organizations and distributed leadership are  
35  
36 presented as solutions, yet medical leaders still believe that real decision-making power lies  
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38 outside of care environments, is externalized, and hierarchical.[15,45] Decentralization has  
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40 been highlighted as a contributor to role ambiguity and overload.[17,46] A lack of support  
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42 leads physicians to rely on personality, status, and hierarchy, which are insufficient for  
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44 complex tasks.[28,47] This has a disengaging effect.[32]  
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50 Clinicians on different management levels in hospitals and primary care describe a sense of  
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52 powerlessness over being held accountable for performance measures and organizational  
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54 issues with neither the authority, staff, budget, time, nor support to actually implement change  
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56 or to improve.[15,21,32,45,46,48] The overwhelming number of performance targets and  
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58 guidelines that are externally imposed conflict with professional values and interests,[26,49]  
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1 Conditions affecting medical leadership

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3 and are so demanding that managers tend to focus on compliance, rather than the proactive  
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5 development of new solutions, and interest in knowledge creation and innovation  
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7 diminishes.[16,49] Lack of internal peer support makes medical leaders feel that they are  
8  
9 alone with their managerial challenges with limited opportunities to discuss and develop ideas  
10  
11 for improvement.[21,44] The positive potential of performance measurement, particularly in  
12  
13 terms of monitoring quality data, does not materialize due to a lack of ownership over the  
14  
15 indicators and also because of problems with access to data and insufficient resources for data  
16  
17 collection.[21,48] The time delay between patient safety incidents and quality reports  
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19 undermine clinicians' confidence in the data[49] and impede accountability for outcomes.[28]  
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### 23 *Participatory leadership practices*

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25 Physicians need to be given the opportunity to exhibit inclusive leadership behaviors such as  
26  
27 explicitly soliciting team input and engaging in participatory decision-making, which in turn  
28  
29 help improve their managerial self-efficacy.[3,50] Working with a shared vision,  
30  
31 demonstrating compassion, and other positive leadership experiences are associated with  
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33 managerial job engagement, performance, and participation in leadership activities.[32,44,51–  
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41 Co-designing performance measures with clinicians, motivates, provides autonomy, makes  
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43 measurement meaningful, enables local improvement, and can reinforce professionalism in  
44  
45 ways that improve the manager-clinician relationship.[24,35,38,39,48,54–56] Physicians can  
46  
47 be engaged through continual dialogue to align agendas for quality and safety[21,39,57] and  
48  
49 through the design of service delivery.[3,15] Anchoring quality improvement in professional  
50  
51 practice, and combining it with education and research, lead to positive views on further  
52  
53 improvement initiatives.[3,21,25,29,32,35,38,39,56]



1 Conditions affecting medical leadership

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3 Similarly, budgetary participation supports accountability through autonomy as it positively  
4  
5 correlates with budget goal commitment, use of budget information, and therefore budgetary  
6  
7 performance.[58] It also improves overall managerial job engagement as it affects managerial  
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9 self-efficacy, helps to identify with organizational goals, and, along with role clarity,  
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11 promotes constructive managerial work attitudes.[51,58–60] Tools, such as managerial  
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13 accounting could co-exist with clinical practice as they are often seen as technical tools  
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15 without threat to professional autonomy.[24]  
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23 *Organizational practices to nurture willing vs. incidental leaders*

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25 Organizational practices that nurture either willing or incidental leaders can be described in  
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27 terms of recruitment of medical leaders, top management support, and strategic leadership  
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29 development.  
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33 *Recruitment of medical leaders*

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35 Health care organizations require a large number of clinically trained leaders at all levels of  
36  
37 the organization, in particular high quality first-line management.[6,19] Despite the fact that  
38  
39 interest in leadership can arise from boredom with clinical routine and a desire to take on new  
40  
41 challenges,[23] sixty-two percent of executive positions in teaching hospitals are filled by  
42  
43 external hires, which suggests a failure to identify, develop, and promote emerging leaders  
44  
45 from within the organization.[40,61] Recruitment of medical leaders most often occurs  
46  
47 through informal networks and succeeds through the persuasive ability of the current  
48  
49 managers, without explicit selection criteria or expectations related to performance objectives,  
50  
51 goals, or measures of success.[23,33,44,45] When formal recruitment procedures are  
52  
53 followed, the process still tends to be *ad hoc* and lessons learned by search committees are  
54  
55 neither captured nor shared. The consequence of these coercive or *ad hoc* approaches that  
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1 Conditions affecting medical leadership

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3 generate “incidental” leaders instead of “willing” leaders can be seen early in leadership  
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5 development, where the latter are more able to “absorb” or construct managerial  
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7 expertise.[40,51,62]  
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9  
10 To avoid “incidental” medical leaders, recruitment should be formalized, identification of  
11  
12 leadership potential should start at an early stage by engaging in conversations with front-line  
13  
14 physicians, and these future physician leaders should be supported and molded through op-  
15  
16 portunities to lead new initiatives.[2,23,32,40,44] In that process, assessment of professionals’  
17  
18 self-efficacy as a predictor of motivation to lead is recommended.[46] Selection of leaders  
19  
20 should be part of the overall talent management system[61] and the position should be  
21  
22 matched to the strategic, structural, and political context.[21,45,63] Demographics should be  
23  
24 considered to avoid management by the “old boys’ club”.[32] The recruitment process should  
25  
26 set clear expectations on what is acceptable professional behavior as a medical leader in order  
27  
28 to be able to enforce these behaviors in case of a mismatch.[63] While the most frequently  
29  
30 displayed and among the most valued leadership attributes among physicians is being  
31  
32 inspirational, it has the least impact on staff satisfaction.[4] Those physicians who  
33  
34 demonstrate interest in quality, patient safety, and overall leadership aptitude should be  
35  
36 sought.[21,45,63] Backgrounds as general internists and practicing hospitalists (or other  
37  
38 holistic specializations) seem favorable.[16,21]  
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#### 46 *Top management support*

47  
48 Senior leadership teams, particularly CEOs, manage physicians by nagging, arguing, and  
49  
50 reminding them of their responsibilities, i.e. they fail to meaningfully engage medical  
51  
52 leaders.[43,64,65] CEOs and senior leadership teams tend to crowd medical leaders’ agendas  
53  
54 with numerous committees or “strategic” meetings that are filled with operational, not  
55  
56 strategic matters.[21,41,44]  
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## Conditions affecting medical leadership

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3 A questionnaire study among staff at the NHS concluded that effective leadership practice  
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5 (e.g. engaging staff and collaborators in achieving a compelling vision) is correlated with  
6  
7 hospital performance.[1] In addition, there is a correlation between how effectively boards  
8  
9 work with quality of care and how well executive management teams as a consequence  
10  
11 monitor quality and manage operations.[55,57,66] Top-level teams should be stable and  
12  
13 acknowledge physicians' medical expertise and academic competence,[52,65] and foster  
14  
15 collaborative relationships, effective communication, diffusion of expert knowledge between  
16  
17 managers and professionals, and demonstrate a proactive culture for decision-  
18  
19 making.[24,32,49,54,63,67] They also need to remove barriers to medical leadership, e.g.  
20  
21 reduce the burden of administrative tasks related to information technology, performance  
22  
23 analysis, and financial management; lack of financial incentives; time commitment pressures;  
24  
25 overall lack of support, and challenges tied to the timing, location, and process of managerial  
26  
27 meetings.[17,20,23,28,31–33,44] This can be done by setting clear expectations[44],  
28  
29 introducing collective leadership[19] or through hybrid organizations.[68] The latter resonates  
30  
31 well with the idea of professional bureaucracies where staff has greater influence on decision  
32  
33 making than people in formal positions of authority.[19]

### *Strategic leadership development*

34  
35 Current undergraduate medical education programs provide only limited opportunities for  
36  
37 professional development and neglect strengthening the ethos and professionalism that would  
38  
39 make physicians better fit for the purpose of their work.[21] During their clinical careers, they  
40  
41 are not sufficiently exposed to professionals who are able to develop their managerial  
42  
43 mindset.[20] Management skills are perceived to be in conflict with a medical case-  
44  
45 orientation and interventionist professional action.[29] Previous experiences of being a  
46  
47 manager at the unit level are not enough either – physicians still have the tendency to be  
48  
49 occupied with small scale problem solving which makes it difficult to develop the essential  
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1 Conditions affecting medical leadership

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3 strategic hospital-wide perspective.[20] Even if physicians enter management, they see this  
4  
5 merely as an intermediate role.[31] Medical leaders feel they are thrown into their roles and  
6  
7 then expected to learn management on their own and on-the-fly.[23,33] Traditional leadership  
8  
9 development programs tend to emphasize the difference between management and leadership,  
10  
11 which adds to the problem of translating these to practical situations where they actually are  
12  
13 intertwined.[41] Leadership training is rarely followed up with concrete opportunities to  
14  
15 engage in hospital strategy development.[20]  
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20 The introduction of management competencies needs to start early and focus on taking  
21  
22 initiative, organizational and system understanding, becoming team players, communication,  
23  
24 and shared decision-making.[20,28,65] Leadership development provides four important  
25  
26 opportunities to improve quality and efficiency in healthcare, by (1) increasing the caliber of  
27  
28 the workforce, (2) enhancing efficiency in the organization's education and development  
29  
30 activities, (3) reducing turnover and related expenses, and (4) focusing organizational  
31  
32 attention on specific strategic priorities.[69] Training should improve leaders abilities to  
33  
34 address system level challenges and benefit the service, not just the individual.[19,70]  
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38 Development initiatives create a space for informal conversations that shape attitudes towards  
39  
40 teamwork, safety, management and working conditions.[16,41,71] Investments in leadership  
41  
42 development should be made at all organizational levels and be seen as part of the strategic  
43  
44 development of an organization.[19]  
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47  
48 Teaching approaches should move from competency to capability development through  
49  
50 integration with ongoing improvement efforts where the focus is on participants' actual  
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52 challenges as opposed to merely talking about problem solving.[22,23,29,62,63] Everyday  
53  
54 work practices can become opportunities to develop and test new approaches to service  
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56 provision and to acquire management and leadership skills (e.g. via efficient meetings,  
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58 medical teamwork, joint decision-making, and the delegation of responsibilities).[25,29]  
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1 Conditions affecting medical leadership

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3 Inter-professional education and training are critical to improve managerial self-efficacy,  
4 interest, and readiness to be involved in managerial work.[32,38,40,46] Through mentoring,  
5 coaching and networks, medical leaders with similar roles can share experiences, tools, and  
6 strategies.[21,22,32,40]  
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## 12 **DISCUSSION**

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16 This review provides an in-depth analysis of the conditions instrumental for medical  
17 leadership to have an impact on organizational performance. Based on the identified  
18 conditions that facilitate or impede the influence of medical leadership, two opposing  
19 schemata related to willing vs. incidental leadership can be discerned (Figure 4).  
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26 <<<Insert Figure 4 here>>>

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33 The virtuous cycle describes a set of interdependent strategies that help to anchor  
34 management in medicine. The pivotal point is to identify willing leaders who are committed  
35 to continually improve their own management and leadership competencies. They are  
36 nurtured by an embedded leadership development strategy that fosters participatory leadership  
37 practices. Participation cultivates medical engagement among staff and thereby increases  
38 interest in leadership roles and management positions. This, in turn, contributes to favorable  
39 conditions for formal recruitment and expands the recruitment pool of future willing leaders.  
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50 In the vicious cycle, managerial positions are filled by incidental leaders with little interest to  
51 improve their own leadership competencies. The lack of interest is reinforced by disconnected  
52 leadership development efforts that are perceived as irrelevant to the improvement of health  
53 care. Managers mimic historically dominant managerial approaches, i.e. management by  
54 command and control, which leads to medical disengagement among staff. Disinterest in  
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1 Conditions affecting medical leadership

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3 leadership roles encourages informal recruitment practices which perpetuates the risk for  
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5 incidental leaders.  
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11 The findings of this review resonate with the emerging field of research tied to physician or  
12  
13 medical engagement. Medical engagement is defined as a reciprocal relationship between the  
14  
15 individuals and the organizational system: “the active and positive contribution of doctors,  
16  
17 within their normal working roles, to maintaining and enhancing the performance of the  
18  
19 organization, which itself recognizes this commitment, in supporting and encouraging high  
20  
21 quality care”.<sup>[52]</sup> A recent review elaborates that physician engagement is about “regular  
22  
23 participation of physicians in (1) deciding how their work is done, (2) making suggestions for  
24  
25 improvement, (3) goal setting, (4) planning, and (5) monitoring of their performance in  
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27 activities targeted at the micro (patient), meso (organization), and/or macro (health system)  
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29 levels.”<sup>[72]</sup>  
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35 While Spurgeon *et al.*<sup>[63]</sup> ask if it is medical leadership or medical engagement that is needed  
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37 for better performance, we suggest that medical engagement is intimately dependent on the  
38  
39 quality of medical leadership. The virtuous cycle of medical leadership illustrates how  
40  
41 medical leadership can intervene at the individual, organizational and system levels to  
42  
43 enhance medical engagement. At the individual level, medical leaders can explicitly use their  
44  
45 medical knowledge to interpret and explain the medical consequences of managerial  
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47 decisions.<sup>[73]</sup> This would demonstrate commitment to improve health care, model an  
48  
49 integrative view of management and medicine, and subsequently, enhance professional  
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51 identities. At the organizational level, medical leaders should formalize recruitment processes,  
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54 get top management teams to acknowledge and engage medical expertise and academic  
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56 competence, and embed leadership development in medical practice through quality  
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## Conditions affecting medical leadership

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3 improvement. Finally, the highest level of medical leadership, including political decision  
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5 makers, need to develop an inclusive and collaborative culture characterized by openness,  
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7 trust, and respect, by engaging health professionals in the design and monitoring of  
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9 performance measures. These combined efforts will not only cultivate medical engagement  
10  
11 and by that improve the performance of individual health care organizations. They will also  
12  
13 enable a shift to new leadership paradigms suitable to the complexity of health care,[74] and  
14  
15 establish conditions favorable for large-system transformation and health care reform.[75]  
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20 In terms of future research, the field of medical leadership would benefit from studies  
21  
22 conducted in primary care, include leaders at other than senior managerial levels, and from  
23  
24 non-Anglo-American settings. While we came across a few studies on gender balance and  
25  
26 internationalization of the clinical workforce, perspectives on the consequences for medical  
27  
28 leadership are lacking. Qualitative studies could further deepen our understanding of the  
29  
30 relationship between management and medicine in everyday clinical practice in order to  
31  
32 inform leadership development and human resource management efforts. Finally, this review  
33  
34 alludes to a need to design and evaluate medical leadership development programs that are  
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36 theory-based, evidence-informed, and organizationally embedded.  
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41 This review is limited by the quality and heterogeneity of included studies. Quality appraisal  
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43 of the individual studies in terms of strength of evidence was not conducted due to the  
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45 reviews broad focus which lead to significant diversity of research designs. Since the search  
46  
47 was timebound to capture contemporary evidence and limited to three databases, we cannot  
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49 guarantee that all relevant articles were found. While plausible correlations between  
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51 conditions and performance outcomes are explored, to establish causality requires other  
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53 approaches to test and determine the strength of the relationships.  
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Conditions affecting medical leadership

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### CONCLUSION

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The identification of the virtuous or vicious cycles of medical leadership can help us better understand how medical leadership can be both a boon or a barrier to the positive impact that health care organizations desire for their patients, staff, and society. We can choose to either create willing leaders through medical engagement or accept incidental leaders through medical protectionism. This complex challenge involves questioning conventional wisdom on management and medicine in favor of more participative practices that require long-term investments at the individual, organizational, and system levels.

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**Authors' contributions:** MS, CS, MB, and PM designed the study. MS conducted the search with support from a professional research librarian. MS screened titles, key words, and abstracts for inclusion. All authors screened full texts for inclusion. MS extracted data and performed line-by-line coding of the included studies. Based on codes, all authors collectively developed descriptive and analytic themes. MS drafted the manuscript. All authors read, revised, contributed to, and approved the final manuscript. PM was the principal investigator.

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**Ethical approval:** An ethical vetting was deemed unnecessary.



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For peer review only

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**FIGURE LEGENDS**

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34 Figure 1 An explanatory model of factors that mediate the positive and negative effects of  
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36 physician leadership (adapted from (Sarto and Veronesi 2016)).  
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39 Figure 2 PRISMA Flowchart.  
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42 Figure 3 General characteristics of included studies.  
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46 Figure 4 The virtuous and vicious cycles of medical leadership.  
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**Benefits**

- Critical knowledge for decision making process and related improvement of decision making quality
- Higher credibility and related higher adoption of hospital policies by medical staff
- Improved organizational reputation and attraction of talented personnel
- Reinforcement of medical commitment to cost containment
- Greater attention to patient needs due to clinicians' ethical beliefs and professional norms

+ Quality of care

+/- Management of financial and operational resources

+/- Social performance

**Problems**

- Conflicts between clinicians and managers
- Role conflict of clinical-managers and related decisions made at the expense of financial performance
- Lack of managerial and accounting expertise
- Conflict of interest of private doctors

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Records identified through database searching  
(n = 1447)

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Records excluded after screening titles and key words  
(n = 1057)

Records screened for abstract  
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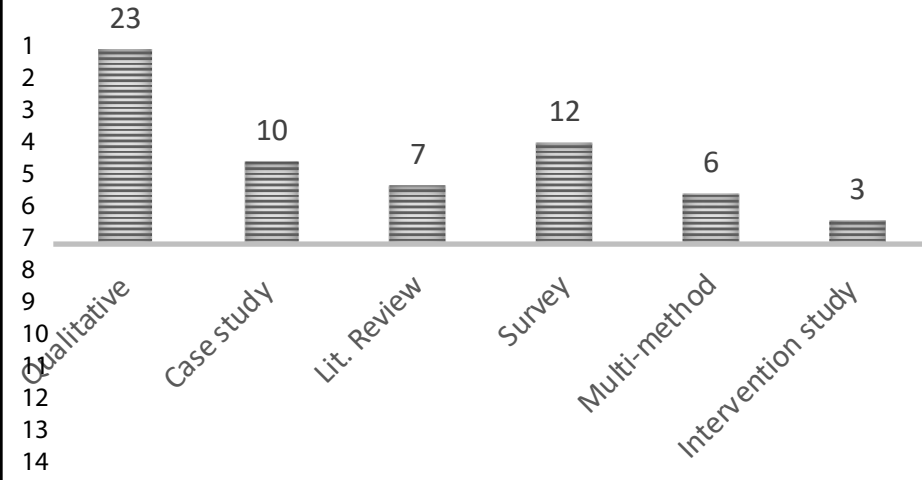
Records excluded after screening abstracts  
(n = 178)

Full-text records assessed for eligibility  
(n = 189)

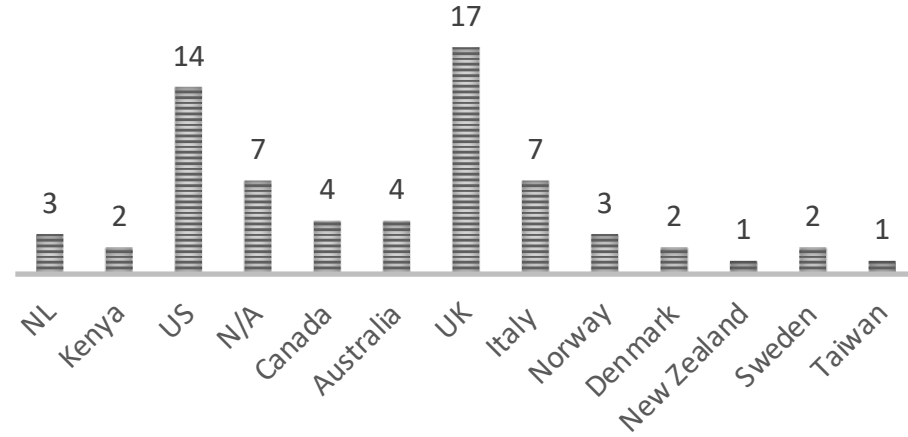
Full-text records excluded based on criteria: full-text not available; purely quantitative reports on organizational performance outcomes or leadership development evaluations; not addressing physicians in the leadership and management of health care  
(n = 127)

Studies included in thematic synthesis  
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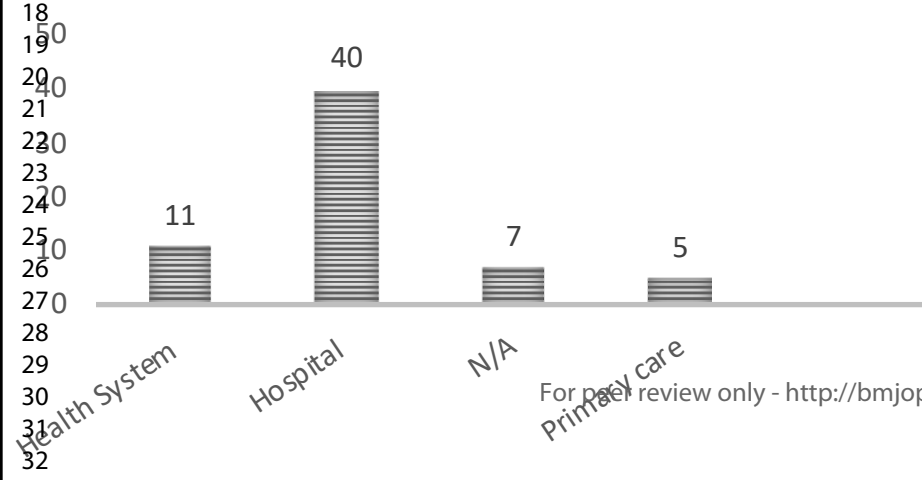
# STUDY DESIGN



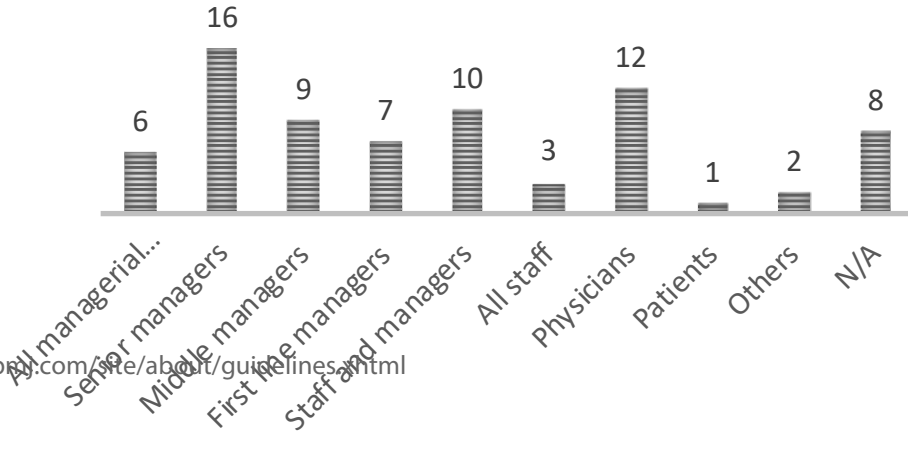
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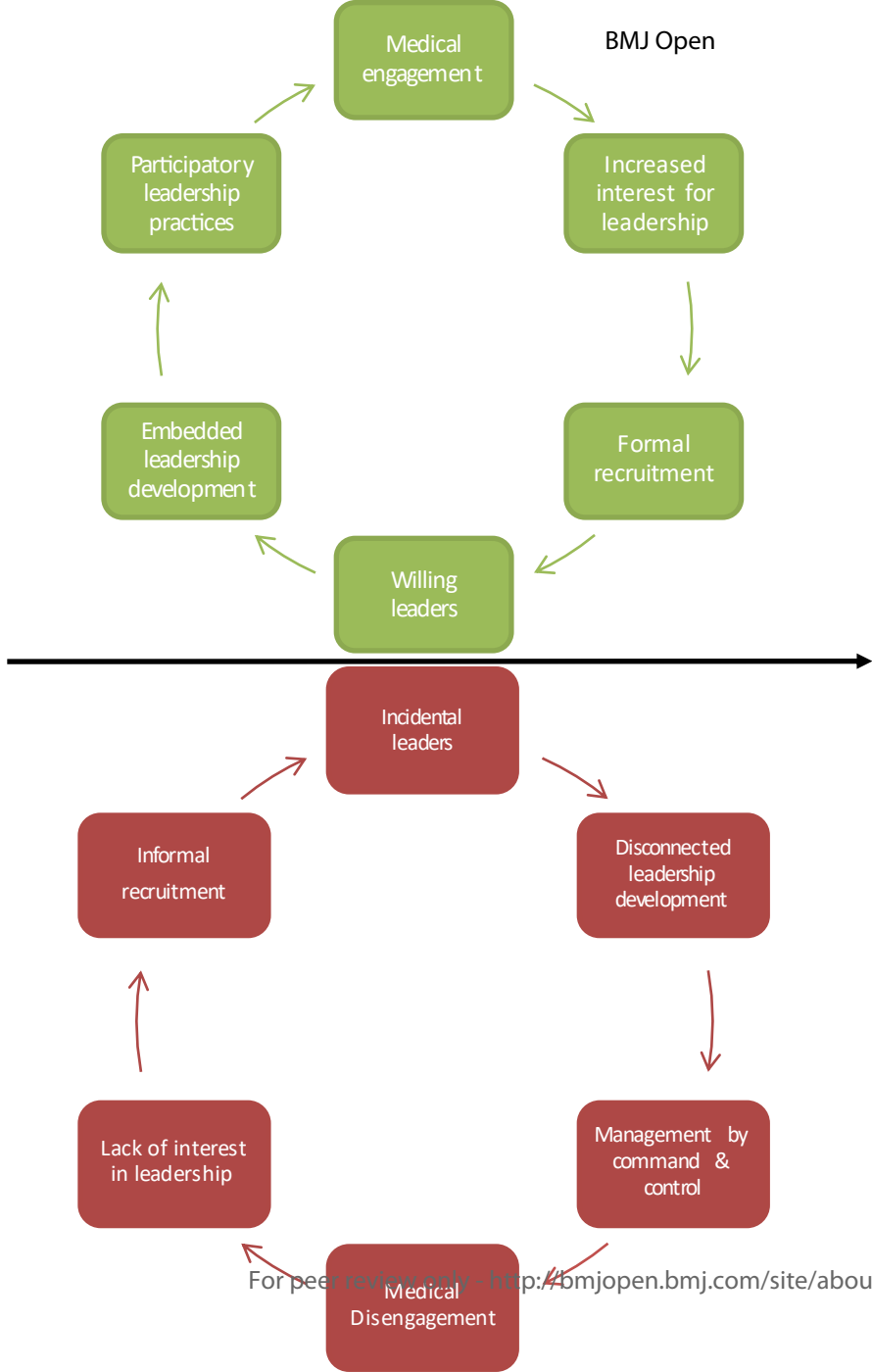


# STUDY PARTICIPANTS



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# Physician leadership



- **Quality of care**
- **Financial performance**
- **Staff satisfaction, retention, burnout & performance**
- **IT adoption**
- **Approval of reforms**

## Conditions affecting medical leadership

## APPENDIX 1 THE ENTREQ STATEMENT

No	Item	Guide and description	Page
1.	Aim	State the research question the synthesis addresses.	4
2.	Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology (e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis).	5
3.	Approach to searching	Indicate whether the search was pre-planned (comprehensive search strategies to seek all available studies) or iterative (to seek all available concepts until they theoretical saturation is achieved).	5
4.	Inclusion criteria	Specify the inclusion/exclusion criteria (e.g. in terms of population, language, year limits, type of publication, study type).	6
5.	Data sources	Describe the information sources used (e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists) and when the searches conducted; provide the rationale for using the data sources.	5
6.	Electronic Search strategy	Describe the literature search (e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits).	5
7.	Study screening methods	Describe the process of study screening and sifting (e.g. title, abstract and full text review, number of independent reviewers who screened studies).	6
8.	Study characteristics	Present the characteristics of the included studies (e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions).	7
9.	Study selection	Identify the number of studies screened and provide reasons for study exclusion (e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development).	7
10.	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings).	6
11.	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope [25]; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting).	N/A
12.	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	N/A
13.	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	N/A
14.	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? (e.g. all text under the headings "results /conclusions" were extracted electronically and entered into a computer software).	6



## Conditions affecting medical leadership

15.	Software	State the computer software used, if any.	7
16.	Number of reviewers	Identify who was involved in coding and analysis.	6-7
17.	Coding	Describe the process for coding of data (e.g. line by line coding to search for concepts).	6-7
18.	Study comparison	Describe how were comparisons made within and across studies (e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary).	N/A
19.	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	6
20.	Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations or the author's interpretation.	N/A
21.	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct).	8-17

## Conditions affecting medical leadership

**APPENDIX 2 DETAILED OVERVIEW OF THE INCLUDED STUDIES**

No	Reference	Study design	Country	Setting	Study participants
1.	Berghout, M., <i>et al.</i> (2018).	Qualitative: observations and document analysis	The Netherlands	Health system	Opinion-making physicians
2.	Nzinga, J., McGivern, G., & English, M. (2018).	Case study: ethnographic observation (480 h), interviews, focus groups (n=61)	Kenya	Hospital	Mid-level departmental leaders, nurses in charge of inpatient wards, senior managers, frontline workers
3.	Yanchus, N. J., <i>et al.</i> (2018).	Qualitative survey comments	US	Health system	Physicians
4.	Berghout, M. A., <i>et al.</i> (2017).	Literature review	N/A	Hospital	Physicians in managerial or leadership roles
5.	Bharwani, A., <i>et al.</i> (2017).	Interview study (n=77)	Canada	Academic medicine system	Trainees, mid-level university leaders, senior medical clinical leaders, senior university leaders, medical scientists, senior executives and directors
6.	Canaway, R., <i>et al.</i> (2017).	Semi-structured interviews (n=17)	Australia	Hospital	Senior management
7.	Clay-Williams, R., <i>et al.</i> (2017).	Literature review	N/A	N/A	Senior management
8.	Dickinson, H. <i>et al.</i> (2017).	Case study: 9 cases, 150 interviews	UK	Hospital	Doctors, nurses and managers
9.	Giri, P., Aylott, J., & Kilner, K. (2017).	Quantitative: survey study (n=249)	UK	N/A	Faculty of Occupational Medicine

## Conditions affecting medical leadership

10.	Ileri, S. K., <i>et al.</i> (2017).	Multi-method: 25 interviews, survey (n=292)	UK & Kenya	Hospital	Middle and senior management
11.	Jones, L., <i>et al.</i> (2017).	Qualitative: interviews (n=65), observations (60 hours), document analysis	UK	Hospital	Senior management
12.	Kerrissey, M., <i>et al.</i> (2017).	Case study: 16 clinics, 18 interviews	US	Primary care	All staff, interviews with heads of clinics
13.	Macinati, M. S., Cantaluppi, G., & Rizzo, M. G. (2017).	Multi-method study: literature review, performance data, unstructured interviews, questionnaire n=72	Italy	Hospital	Physicians
14.	Spehar, I., <i>et al.</i> (2017).	Interview study: Focus group interviews with 17 GPs	Norway	Primary care	Physicians
15.	Storkholm, M. <i>et al.</i> (2017).	Interview study (n=30)	Denmark	Hospital	Staff and managers
16.	Waring, J., & Crompton, A. (2017).	Case study: non-participant observation's (90 hours), semi-structured interviews (n=34), focus groups (n=3) and document analysis	UK	Hospital	Senior managers, senior medical and nursing leaders, quality and safety managers, senior human resources, communications and operations managers, nurses, doctors, departmental managers, and support workers.

## Conditions affecting medical leadership

17.	Clark, K. D., <i>et al.</i> (2016).	Case study: Observational cross-case comparative study (19 practices)	US	Primary care	Staff and leaders at all levels
18.	Denis, J.-L., & van Gestel, N. (2016).	Qualitative: Document analysis	The Netherlands and Canada	Health system	N/A
19.	Kristensen, S., <i>et al.</i> (2016).	Intervention study: A repeated cross- sectional experimental study, 2 surveys	Denmark	Hospital	Staff and managers
20.	Lega, F., & Sartirana, M. (2016).	Qualitative: literature review, action-research and field investigations	Italy	Hospital	N/A
21.	Macinati, M. S., Bozzi, S., & Rizzo, M. G. (2016).	Multi-method: Literature review to develop hypothesis, performance data, unstructured interviews, questionnaire (n=65)	Italy	Hospital	First and middle managers
22.	Macinati, M. S., & Rizzo, M. G. (2016).	Multi-method: key informant interviews, document analysis, questionnaire n=53	Italy	Hospital	General manager, administrative officer, controller, clinical managers
23.	Noordegraaf, M., <i>et al.</i> (2016).	Qualitative: document analysis, observation, interviews (n=38)	The Netherlands	Hospital	Residents and program directors
24.	Sarto, F., & Veronesi, G. (2016).	Literature review	N/A	Hospital	Senior management

## Conditions affecting medical leadership

25.	Bresnen, M., <i>et al.</i> (2015).	Qualitative: n=85 interviews with 68 respondents, 54 hours of observations	UK	Two hospitals and a trust providing mental health and community services	Medical, general, and functional managers.
26.	Burgess, N., <i>et al.</i> (2015).	Interview study (n=91)	UK	Hospital	Middle managers
27.	Martin, G., <i>et al.</i> (2015).	Interview study: 56 focus group interviews, 46 individual interviews, 25 in-depth individual interviews	UK	Primary and secondary care	Staff and managers
28.	Mascia, D., <i>et al.</i> (2015).	Survey, n=791	Italy	Hospital	Physicians
29.	Quinn, J. F. (2015).	Survey, (n=677)	US	N/A	Senior managers
30.	Spurgeon, P., <i>et al.</i> (2015).	Survey, UK 30 trusts, Australia and New Zealand 4 sites	UK, Australia and New Zealand	Hospital	All staff
31.	Tsai, T. C., <i>et al.</i> (2015).	Survey (n=722 in the US, n=132 in the UK)	UK & US	Hospital	First line and senior managers
32.	Damschroder, L. J., <i>et al.</i> (2014).	Interview study (n=62)	US	Hospital	Network-level and facility-level executives, managers, front-line providers and staff
33.	Macinati, M. S., & Rizzo, M. G. (2014). <i>et al.</i>	Multi-method: key informant interviews, document analysis, questionnaire (n=70)	Italy	Hospital	First and middle managers
34.	Moffatt, F., Martin, P., &	Qualitative:	UK	Health system	N/A

## Conditions affecting medical leadership

	Timmons, S. (2014).	Document analysis			
35.	Nelson, M. F., <i>et al.</i>	Intervention study	US	Hospital	Physicians, nurse managers, administration, and board members
36.	Nicol, E. D., Mohanna, K., & Cowpe, J. (2014).	Interview study (n=20)	UK	Health system	Senior management
37.	Lega, F., Prenestini, A., & Spurgeon, P. (2013).	Literature review	N/A	N/A	N/A
38.	Fulop, L. (2012).	Interview study (n=31)	Australia	Hospital	Clinical managers
39.	Howard, J., <i>et al.</i> (2012).	Case study: observation notes, meeting recordings, interviews (n=8)	US	Primary care	Physician leaders
40.	Mallon, W. T., & Buckley, P. F. (2012).	Literature review	N/A	Hospital	Senior management
41.	Numerato, D., Salvatore, D., & Fattore, G. (2012).	Literature review	N/A	N/A	N/A
42.	Spehar, I., Frich, J. C., & Kjekshus, L. E. (2012).	Qualitative: In-depth interviews (n=30) and participant observations (n=20)	Norway	Hospital	First line and middle managers
43.	Choi, S., <i>et al.</i> (2011).	Single case study: 22 interviews, 22 hours of observations and document analysis	Sweden	Hospital	Senior management

## Conditions affecting medical leadership

44.	Ham, C., <i>et al.</i> (2011).	Interview study (n=20)	UK	Health system	Senior management
45.	Lin, B. Y.-J., <i>et al.</i> (2011).	Survey (n=448)	Taiwan	Hospital	Staff and middle managers
46.	Snell, A. J., Briscoe, D., & Dickson, G. (2011).	Survey (n=51)	Canada	N/A	Physicians who have attended leadership development courses
47.	Spurgeon, P., Mazelan, P. M., & Barwell, F. (2011).	Survey: (n=30 secondary care trusts)	UK	Secondary care trusts	Physicians
48.	Albert, K., Sherman, B., & Backus, B. (2010).	Intervention study	US	Hospital	First line and middle managers
49.	Hayes, C., <i>et al.</i> (2010).	Case study	Canada	Hospital	Middle managers
50.	von Knorring, M., de Rijk, A., & Alexanderson, K. (2010).	Interview study (n=18)	Sweden	Health system	Senior management
51.	Jiang, H. J., <i>et al.</i> (2009).	Quantitative (n=562)	US	Hospitals and health system	Senior management
52.	Johansen, M. S., & Gjerberg, E. (2009).	Multi-method (interviews 44; survey 166)	Norway	Hospital	Managers from different levels
53.	Waring, J., & Currie, G. (2009).	Case study (observations 200hrs, semi-structured interviews n=43)	UK	Hospital	Hospital managers, senior physician leaders, nursing director, senior physicians, staff
54.	Epstein, A. L., & Bard, M. A. (2008).	Interview study (n=68)	US	Hospital	Middle managers
55.	Ham, Chris, & Dickinson, H. (2008).	Literature review	N/A	N/A	N/A
56.	Lega, F. (2008).	Qualitative: Literature review, action-	Italy	Health system	N/A

## Conditions affecting medical leadership

		research and field investigations			
57.	McAlearney, A. S. (2008).	Interview study (n=200)	US	Health system	Hospital and health system managers and executives, academic experts, consultants, association reps, vendors of leadership development programs, program participants
58.	Menaker, R., & Bahn, R. S. (2008).	Survey (n=314)	US	Hospital	Physicians and senior managers
59.	Shipton, H., <i>et al.</i> (2008).	Survey (n=17 949)	UK	Hospital	Staff
60.	Sorensen, R., & ledema, R. (2008). R	Ethnographic study: observation, interviews, focus groups (n=89)	Australia	Hospital	Medical managers, physicians, nursing managers, nurses, patients, other external palliative care specialists
61.	Waring, J. (2007).	Case study (observations 200hrs, semi-structured interviews n=43)	UK	Hospital	Hospital managers, senior physician leaders, nursing director, senior physicians, staff
62.	Prybil, L. D. (2006).	Quantitative (14 hospitals)	US	Hospitals	N/A



# BMJ Open

## Medical leadership – a boon or barrier to organisational performance? A thematic synthesis of the literature

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Conditions affecting medical leadership

**Title:**

Medical leadership – a boon or barrier to organisational performance? A thematic synthesis of the literature

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Conditions affecting medical leadership

## Abstract

**Objective:** The influx of management ideas into health care has triggered considerable debate about if and how managerial and medical logics can co-exist. Recent reviews suggest that clinician involvement in hospital management can lead to superior performance. We therefore sought to systematically explore conditions that can either facilitate or impede the influence of medical leadership on organisational performance.

**Design:** Systematic review using thematic synthesis guided by the Enhancing Transparency in Reporting the synthesis of Qualitative research statement (ENTREQ).

**Data sources:** We searched PubMed, Web of Science, and Psycinfo from January 1, 2006 through January 21, 2020.

**Eligibility Criteria:** We included peer-reviewed, empirical, English language articles and literature reviews that focused on physicians in the leadership and management of health care.

**Data extraction and synthesis:** Data extraction and thematic synthesis followed an inductive approach. The results sections of the included studies were subjected to line-by-line coding to identify relevant meaning units. These were organized into descriptive themes and further synthesized into analytic themes presented as a model.

**Results:** The search yielded 2176 publications, of which 73 were included. The descriptive themes illustrated a movement from medical protectionism to management through medicine; command and control to participatory leadership practices; and organisational practices that form either incidental or willing leaders. Based on the synthesis, the authors propose a model that describes a virtuous cycle of management through medicine or a vicious cycle of medical protectionism.

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Conditions affecting medical leadership

**Conclusions:** This review helps individuals, organisations, educators, and trainers better understand how medical leadership can be both a boon and a barrier to organisational performance. In contrast to the conventional view of conflicting logics, medical leadership would benefit from a more integrative model of management and medicine. Nurturing medical engagement requires participatory leadership enabled through long-term investments at the individual, organisational, and system levels.

**Key words:** medical leadership; literature review; hospital performance; physician executive

### **Strengths and limitations of this study**

- Previous literature reviews have established a correlation between physicians in leadership roles and organisational performance, this study seeks to explore what contributes to that link.
- The review expands on the typically quantitative focus of systematic reviews by providing a thematic synthesis of sixty-three empirical studies and ten literature reviews.
- The synthesis depicts a virtuous cycle of management through medicine and a vicious cycle of medical protectionism.
- This review is limited by the quality and heterogeneity of the included studies.
- While plausible correlations between conditions and performance outcomes are explored, to establish causality requires study designs that determine the strength of the relationships.

Conditions affecting medical leadership

## INTRODUCTION

Organisational research has established a link between leadership practices and performance.[1] As health care searches for its success formula, the impact of medical leadership on performance has become an increasingly relevant research objective. The two most recent systematic reviews on the subject suggest that clinician involvement in hospital leadership can be linked to superior performance.[2,3] The inclusion of clinical leaders (primarily physicians) in senior management roles has a positive impact on care quality, management of financial and operational resources, and social performance, albeit a few studies showed a negative impact on the latter two.[2] Additional reviews have found effects on staff satisfaction, retention, performance, and burnout;[4–6] psychological safety, respect, and shared goals;[7] approval and support of political reforms[8]; and the adoption of information technology.[9]

While the reviews describe the challenge to discern why medical leadership makes a difference, Sarto and Veronesi,[2] hypothesize about possible mediating mechanisms (Figure 1).

<<<Insert Figure 1 here>>>

The core explanation proffered is centred on the individual's credibility and competence generated by a medical degree.[2] However, two observations can be made, both of which warrant further qualitative exploration. The first is that the mediating mechanisms are drawn from authors' discussions of their quantitative results rather than research designed to specifically explore the mechanisms behind the connections. The second is that the mediating mechanisms exist within a context,[10] i.e. there are conditions that influence to what extent medical competence and credibility can benefit organisational performance. The aim of this

1 Conditions affecting medical leadership

2  
3 study is therefore to systematically explore the conditions that can either facilitate or impede  
4  
5 the influence of medical leadership on organisational performance.  
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## 8 **METHODS**

### 9 **Review protocol**

10  
11  
12 This systematic literature review is a thematic synthesis of empirical studies and literature  
13  
14 reviews. Thematic synthesis was chosen in order to expand the traditionally quantitative focus  
15  
16 of systematic reviews with a method that accommodates a diversity of study designs, provides  
17  
18 policy-makers and practitioners more nuanced evidence for a complex question,[11] and  
19  
20 enables the development of insights beyond those of the original studies through an higher-  
21  
22 order thematic structure.[11,12] Given its qualitative nature, it was guided by the ENhancing  
23  
24 Transparency in REporting the synthesis of Qualitative research (ENTREQ) statement  
25  
26 (Appendix 1).[13]  
27  
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32

### 33 **Patient and Public Involvement**

34  
35 Patients or the public were not involved in the design, conduct, reporting, or dissemination  
36  
37 plans of our research.  
38  
39  
40

### 41 **Search strategy**

42  
43 The strategy was developed with assistance from a professional research librarian. We  
44  
45 conducted a comprehensive search for scientific articles published between January 1<sup>st</sup> 2006  
46  
47 and January 21<sup>st</sup> 2020. We limited the search timeline to capture contemporary evidence in  
48  
49 the light of recently established correlations between medical leadership and performance.[2]  
50  
51 We defined this as the last decade of publications. As the study originally commenced in  
52  
53 2016, we updated the search on 12<sup>th</sup> of August 2018 and on the 21<sup>st</sup> of January 2020. Boolean  
54  
55 searches were performed in Medline/PubMed, Web of Science, and Psychinfo. As the focus  
56  
57 was on physicians, other health care databases such as CINAHL, were excluded. To identify a  
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Conditions affecting medical leadership

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3 wide range of studies, all possible truncated combinations of keywords and MeSH terms such  
4  
5 as “clinical/medical/physician/doctor”, “management/leadership”, “organisation and  
6  
7 management”, “physician executive”, “performance”, and “quality of health care” were used  
8  
9 (Appendix 2). The search was complemented with additional articles from the reference lists  
10  
11 of the articles selected for full-text review.  
12  
13  
14

### 15 **Study selection**

16  
17 Aggregated search results were imported to the Mendeley reference management system  
18  
19 where duplicates were removed. Remaining records were subjected to three rounds of  
20  
21 screening. Inclusion criteria were that articles were peer-reviewed, empirical studies or  
22  
23 literature reviews, and in the English language, published between January 2006 and January  
24  
25 2020 which focused on physicians in the leadership and management of health care. We  
26  
27 included literature reviews to capture patterns across a wide span of studies, i.e. we did not  
28  
29 use these to assess the relative importance of individual factors, but rather to identify relevant  
30  
31 themes in the literature.  
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36  
37 Exclusion criteria were publication prior to 2006, non-English language, not empirical or  
38  
39 literature reviews, non-peer-reviewed, did not include physicians as study participants, and  
40  
41 were reports on care and treatment planning for specific medical conditions. These inclusion  
42  
43 and exclusion criteria were applied when the first author screened all titles and key words, and  
44  
45 then the remaining abstracts. Then, all authors screened the records eligible for full text  
46  
47 review and applied further exclusion criteria: full-text not available; purely quantitative  
48  
49 reports on organisational performance outcomes; studies on attributes and competencies or  
50  
51 leadership development evaluations; or do not address physicians in the leadership and  
52  
53 management of health care (i.e. not about their role in quality improvement, coordination of  
54  
55 care, resource management, team leadership, change management, policy reform, or  
56  
57 descriptions of their individual experiences in such roles). Any discrepancies regarding  
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1 Conditions affecting medical leadership

2  
3 inclusion were resolved through consensus. All included studies were then subjected to a  
4  
5 critical appraisal performed by the first author (Appendix 3). Qualitative studies were  
6  
7 assessed using the Standards for Reporting Qualitative Research.[14] For literature reviews, a  
8  
9 14-item checklist was developed informed by Smith *et al.*[15] and Shea *et al.*[16] Mixed  
10  
11 methods and quantitative studies were subjected to a Mixed Methods Appraisal Tool.[17] The  
12  
13 appraisals primarily assessed the quality of reporting and no articles were excluded based on  
14  
15 the appraisal.[18]  
16  
17

### 18 **Data extraction and analysis**

19  
20 Data on general characteristics included type of study design, country of origin, setting, and  
21  
22 study participants. Data extraction and analysis followed an inductive approach. The results  
23  
24 sections were read line-by-line to identify meaning units describing the conditions (i.e.  
25  
26 situations, settings, circumstances, behaviours, contextual factors etc.) that influenced medical  
27  
28 leadership and organisational performance. The first author summarized these as codes, which  
29  
30 were then organized into descriptive themes by all authors.[12] Data extraction and analysis  
31  
32 was performed in NVivo qualitative data analysis software; QSR International Pty Ltd.  
33  
34 Version 10, 2012.  
35  
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41 Given the interpretative nature of thematic synthesis, its primary output is a high-order  
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43 theoretical structure.[11] Therefore, based on descriptive themes, the authors developed a  
44  
45 preliminary model (analytical themes) to depict conditions that facilitate or impede the impact  
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47 of medical leadership.[12] The model was presented and refined after discussions with  
48  
49 practicing clinicians and managers in our graduate and continuing professional development  
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51 courses and at conferences in Sweden and Europe.  
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Conditions affecting medical leadership

## RESULTS

The search identified 2176 records (PubMed 723, Web of Science 1119, and Psychinfo 353). After removing duplicates and adding 26 records identified from reference lists, the tally was 2151 records. Titles and key words were screened which yielded 447 records. After abstracts were screened, 216 articles remained. After a full-text screening, 73 articles were included in the thematic synthesis (Figure 2). Of these, sixty-three were empirical articles (qualitative, quantitative or mixed methods designs) and ten literature reviews.

<<<Insert Figure 2 here>>>

### General characteristics

Most studies were conducted in the UK (n=17) and the US (n=16), in hospital settings (n=45), and focused on senior managers (n=19). Qualitative designs were used in 29 studies, followed by 13 surveys and 11 case studies (Figure 3). The empirical studies together reported on 1006 hours of observations, 1697 interviews, and 24744 survey responses. A detailed overview of the included studies is provided in Appendix 4.

<<<Insert Figure 3 here>>>

### Conditions that can either facilitate or impede the influence of medical leadership on organisational performance

Three themes were identified: From medical protectionism to management through medicine; from command and control to participatory leadership practices; and organisational practices that form willing vs. incidental leaders (Table 1). References to the relevant articles are provided in the text.

Table 1 Descriptive themes, categories and sub-categories identified through the thematic synthesis.

Conditions affecting medical leadership

		<i>IMPEDING CONDITIONS</i>	<i>FACILITATING CONDITIONS</i>
<b>Theme 1</b>		<b>From medical protectionism to management through medicine</b>	
<i>Category</i>	<i>Medical protectionism</i>	<i>Management through medicine</i>	
<i>Sub-category</i>			
<i>Motivation to lead</i>	Safeguard physicians' role, identity & influence	Ensure that management decisions have a positive impact on care and clinical outcomes	
<i>Perception of management</i>	Going over to the "dark side", concerns about losing credibility among clinical peers	A collective decision-making process where expert knowledge is integrated through openness, trust, respect, and cooperation	
<i>View of oneself as a manager</i>	Heroes "working against the odds" or righteous victims "struggling in the face of adversity"	Knowledge brokers who see the opportunity for management to enhance clinical identities	
<i>Role of managerial strategies</i>	To protect autonomy and avoid control, i.e. modernized professionalism	Productivity as individualized professional duty that builds on physicians' inner drive to improve care, i.e. new professionalism	
<i>Outcome of managerial strategies</i>	Disengagement from difficult interactions with colleagues and patients	Engagement across professions that mediates status differences and facilitates knowledge-sharing	
<b>Theme 2</b>		<b>From "command and control" to participatory leadership practices</b>	
<i>Category</i>	<i>Command and control</i>	<i>Participatory leadership practices</i>	
<i>Sub-category</i>			
<i>Organisational attributes</i>	Bureaucratic, policy-driven and hierarchical; poor communication, lack of support, incompetence	Inclusive, solicit input, participatory decision making, shared vision	
<i>Performance measurement</i>	Externally imposed performance measures with no authority, staff, budget, time, etc.	Co-designed performance measures to align quality and safety agendas	
<i>Outcome</i>	Lack of ownership and trust, values conflict, sense of powerlessness, focus on compliance	Autonomy, meaning, local improvement, better management-of clinician relationships, managerial job engagement and self-efficacy	
<b>Theme 3</b>		<b>Organisational practices that form incidental vs. willing leaders</b>	
<i>Category</i>	<i>Practices that form incidental leaders</i>	<i>Practices that form willing leaders</i>	
<i>Sub-category</i>			

## Conditions affecting medical leadership

<i>Recruitment</i>	Informal networks, <i>ad hoc</i> processes, persuasion, lack of explicit selection criteria or expectations	Formalized, with explicit expectations to match strategic context, early identification of leadership potential, considers demographics and self-efficacy
<i>Top management support</i>	Remind of responsibilities by nagging and arguing, crowd agendas with operational matters	Acknowledge and engage medical expertise and academic competence, foster collaborative relationships, effective communication and proactive decision-making, remove barriers such as lack of reward and recognition
<i>Strategic leadership development</i>	Expected to learn management on their own and on-the-fly. Leader development focused on individuals, divorced from everyday challenges and rarely followed up with opportunities for practice	Starts early, occurs on all levels, benefits patient care and system level challenges not just individuals, and is integral to strategic development

## From medical protectionism to management through medicine

The movement from medical protectionism to management through medicine can be described in terms of motivation to lead, perceptions of management, view of oneself as a manager, and the role and outcomes of managerial strategies.

*Motivation to lead*

While some studies describe physicians' motivation to be involved in leadership as a way to safeguard their autonomy, identity, status, influence, and to resist changes tied to their specialty independent of the organisation's needs and goals,[6,19–24] others emphasize physicians' drive to make a difference, improve, and innovate, and their desire to be engaged, and become good leaders.[25,26]

*Perceptions of management*

Managerial and clinical logics are challenging for physicians to reconcile.[27–30]

Management, perceived as an administrative domain, and the medical domain have distinct cultural differences.[31] Physicians are socialized into a specialty with a focus on individual excellence, whereas administrators are team players with diverse backgrounds; clinical

1 Conditions affecting medical leadership

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3 decision-making has a short time horizon with a single course of action whereas  
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5 administrative decision-making results in multiple alternatives.[31] When clinicians take on  
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7 managerial roles, they are perceived to occupy a no-mans-land,[32] often not meeting the  
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9 expectations and authority vested in them.[33] Many are concerned with losing their  
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11 credibility among their peers and becoming outsiders,[34] with management referred to as the  
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13 “dark side”. [27,29,35]  
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17 Other studies suggest an opportunity to move beyond an adversarial view of management and  
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19 medicine where management is intertwined with expert knowledge through openness, trust,  
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21 respect, and cooperation, and understood through its impact on clinical practice.[20,28–  
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23 30,36,37]  
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### 26 27 *View of oneself as a manager*

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29 Medical leaders perceive themselves either as heroes “working against the odds” or as  
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31 righteous victims “struggling in the face of adversity”. [27] The heroic narrative is about  
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33 assuming individual responsibility for achieving one’s vision of the future of health care and  
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35 seeing others, primarily physician-colleagues, in opposition as they are “unwilling to change”,  
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37 “pursuing different interests”, and “bad communicators”. [24]  
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41 In contrast, other medical leaders see themselves as knowledge brokers who can enhance their  
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43 physician identities by bridging management and medicine.[35] Clinicians and non-clinicians  
44  
45 act as partners where understanding is built through communication and presence.[31]  
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48  
49 While some leaders feel it is inappropriate to retain clinical commitments due to a risk of  
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51 being seen as partisan in relation to a specialty or service,[35] most choose to continue  
52  
53 clinical practice to maintain a sense of belonging, enhance legitimacy, and provide inspiration  
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55 and insights into daily work, as well as to keep open the option of returning to clinical work in  
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57 case of failure as a leader.[26,35,37,38]  
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1 Conditions affecting medical leadership

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3 *Role of managerial strategies*

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5 Medical leaders adopt or adapt managerial practices and accept managerial roles as a  
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7 custodial strategy, referred to as “paradigm freeze”.[6,19–22] This “modernized  
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9 professionalism” creates new forms of self-regulation and self-management, such as resisting  
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11 managers’ attempts to control patient safety programs; focusing on minimum necessary  
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13 reporting; selectively participating in managerial meetings; sending out last minute meeting  
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15 agendas to limit managers’ participation; or concealing the significance of certain  
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17 decisions.[20,39] Such behaviours have been characterized as a clinical narrative in medical  
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19 leaders’ identity where the primary focus is on the exclusive nature of caring for patients, i.e.  
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21 health care needs to be safeguarded from non-clinicians.[24] Any collaboration with non-  
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23 clinicians is thought of as ‘making them understand’ or ‘getting them on board’.[31]

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25  
26 On the other hand, managerial strategies can follow a “professional path”, i.e. build on  
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28 medical leaders’ inner drive, resonate with their mental models, and be anchored in quality  
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30 improvement.[30] Collaborative leaders surpass organisational and disciplinary boundaries to  
31  
32 co-produce care with high quality and cost efficiency, i.e. they see the context as a resource  
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34 that can be collectively adjusted as opposed to individually shaped (heroic leaders).[24]

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37 As a support, there has been a conscious move to replace the managerial discourse with a  
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39 leadership discourse.[38,40,41] The term “medical leadership” resonates better with pro-  
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41 fessional groups, can remove tensions between operational requirements and visionary  
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43 aspirations, and potentially influence new work practices.[40,41]

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46 *Outcome of managerial strategies*

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49 As clinical managers appear to adhere to managerial control, their clinical identity and  
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51 professional objectives remain unaffected, i.e. loyalty to the profession trumps loyalty to the  
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53 organisation.[20,32] These dynamics result in personal struggles, causing clinicians to  
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1 Conditions affecting medical leadership

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3 disengage from difficult interactions with colleagues and patients, and medical decision-mak-  
4 ing suffers.[42] When ignoring as opposed to engaging with these aspects of professional  
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6 cultures, professional resistance to change can be triggered.[43]  
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9  
10 When medical leaders choose engagement in management over adherence to managerial  
11 control by defining their own and other's roles, connecting staff, and focusing on goal  
12 attainment, they make way for a "new professionalism".[30,41,44–46] This has been  
13 strengthened by new physician roles (e.g. pathway coordinators and hospitalists), which allow  
14 physicians to engage in managerial work earlier in their careers,[33] and thereby improve  
15 their managerial capabilities, including building their social capital and developing different  
16 perspectives on problems and solutions.[28,30]. In addition, the increasingly multi-  
17 professional, team-based service delivery approaches mediate status differences and facilitate  
18 knowledge-sharing across professions.[25,28,47,48]  
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32 From "command and control" to participatory leadership practices

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34 The movement from management through "command and control" to participatory leadership  
35 practices can be described in terms of differences in organisational attributes, strategies in  
36 performance measurement and their outcomes.  
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#### 41 42 *Organisational attributes*

43  
44 Health care organisations are frequently characterized as bureaucratic, policy-driven, and  
45 hierarchical workplaces with poor organisational communication practices, lack of support for  
46 innovation, conflicts, and incompetence.[25,49–51] Matrix organisations and distributed  
47 leadership are presented as solutions, yet medical leaders still believe that the real decision-  
48 making power lies outside of care environments, is externalized, and hierarchical.[27,52]  
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57 Instead, physicians can be given the opportunity to exhibit inclusive leadership behaviours  
58 such as explicitly soliciting team input, engaging in participatory decision-making, working  
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1 Conditions affecting medical leadership

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3 with a shared vision, demonstrating compassion, establishing accountability for key  
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5 outcomes, transparent communication, nurturing an open space for feedback, and good  
6  
7 working relations.[3,25,51,53–56]  
8  
9

### 10 *Performance measurement*

11  
12 Clinicians on different management levels in hospitals and primary care are held accountable  
13  
14 for performance measures and organisational issues with neither the authority, staff, budget,  
15  
16 time, nor support to actually implement change or to improve.[25,27,34,52,57,58] They find  
17  
18 the channels to contribute to policy-making processes inaccessible or exclusionary or with an  
19  
20 intention to get buy-in as opposed to improve.[59] Executives develop a hostile relationship  
21  
22 with policy makers and a protectionist attitude to their work which spills over to the  
23  
24 organisation and is reflected in the disengagement of care delivery staff.[59] The positive  
25  
26 potential of performance measurement, particularly in terms of monitoring quality data, does  
27  
28 not materialize due to a lack of ownership over the indicators and also because of problems  
29  
30 with access to data and insufficient resources for data collection.[34,57] The time-delay  
31  
32 between patient safety incidents and quality reports undermine clinicians' confidence in the  
33  
34 data[60] and impede accountability for outcomes.[42]  
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41 Instead of being externally imposed, performance measures can be co-designed through  
42  
43 continual dialogue to align agendas for quality and safety[34,48,61] and through the design of  
44  
45 service delivery.[3,27]. Similarly, budgetary participation supports accountability through  
46  
47 autonomy as it positively correlates with budget goal commitment, use of budget information,  
48  
49 and therefore budgetary performance.[62] Tools, such as managerial accounting could co-  
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51 exist with clinical practice as they are often seen as technical tools without threat to  
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53 professional autonomy.[20]  
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1 Conditions affecting medical leadership

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3 These practices can be described as medical engagement, i.e. the ability to (1) decide how  
4 work is done, (2) make suggestions for improvement, (3) set goals, (4) plan, and (5) monitor  
5 performance in activities targeted at the micro (patient), meso (organisation), and/or macro  
6 (health system) levels.[63]  
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12  
13 *Outcomes of management through “command and control” vs. participatory leadership*  
14 *practices*  
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17 Organisational culture that relies primarily on management through command and control,  
18 hamper physician engagement and contribute to a sense of powerlessness.[25,27,34,49–  
19 52,57,58] The overwhelming number of performance targets and guidelines that are externally  
20 imposed conflict with professional values and interests,[22,60] and are so demanding that  
21 managers tend to focus on compliance, rather than the proactive development of new  
22 solutions, and interest in knowledge creation and innovation diminishes.[28,60] A lack of  
23 internal support makes medical leaders feel that they are alone with their managerial  
24 challenges with limited opportunities to discuss and develop ideas for improvement.[34,51]  
25  
26 This leads them to rely on personality, status, and hierarchy – all insufficient for complex  
27 tasks.[42,64]  
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41 When given the opportunity to participate in policy-making, clinicians feel their expertise and  
42 contribution are valued and that policies are rooted in practice realities.[59] Having physicians  
43 act as champions of a policy change, can help to get buy-in from other clinicians and thereby  
44 facilitated the implementation of a policy reform.[65]  
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51 Participatory leadership practices motivate, provide autonomy, make performance  
52 measurement more accurate and meaningful, enable local improvement, and can reinforce  
53 professionalism in ways that improve the manager-clinician relationship. [20,41,47,48,57,66–  
54 68] Anchoring quality improvement in professional practice develops a sense of common  
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1 Conditions affecting medical leadership

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3 responsibility in the organisation, and combining it with education and research nurtures  
4  
5 positive views on further improvement initiatives.[3,21,25,34,41,43,47,48,59,68,69]

6  
7 Budgetary participation improves overall managerial job engagement as it affects managerial  
8  
9 self-efficacy, helps to identify with organisational goals, and, along with role clarity,  
10  
11 promotes constructive managerial work attitudes.[54,62,70,71] Such positive leadership  
12  
13 experiences are associated with managerial job engagement, performance, and participation in  
14  
15 leadership activities.[25,51,54–56] Medical engagement results in increased use of quality-of-  
16  
17 care feedback reports, improved data quality, efficiency, innovation, job satisfaction, and  
18  
19 patient satisfaction.[63,72]

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25 **Organisational practices that form willing vs. incidental leaders**

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27 Organisational practices that form either willing or incidental leaders can be described in  
28  
29 terms of recruitment of medical leaders, top management support, and strategic leadership  
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31 development.

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35 *Recruitment of medical leaders*

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37 Health care organisations require a large number of clinically trained leaders at all levels of  
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39 the organisation, in particular high quality first-line management.[6,32] Despite that interest  
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41 in leadership can arise from boredom with clinical routine, a desire to take on new  
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43 challenges,[19] or aptitude and energy,[73] sixty-two percent of executive positions in  
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45 teaching hospitals are filled by external hires, which suggests a failure to identify, develop,  
46  
47 and promote emerging leaders from within the organisation.[38,74] Recruitment of medical  
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49 leaders most often occurs through informal networks and succeeds through practical reasons  
50  
51 such as availability or the persuasive ability of the current managers, without explicit  
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53 selection criteria or expectations related to performance objectives, goals, or measures of suc-  
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55 cess.[19,23,26,51,52] When formal recruitment procedures are followed, the process still  
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57 tends to be *ad hoc* and lessons learned by search committees are neither captured nor shared.  
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Conditions affecting medical leadership

The consequence of these coercive or *ad hoc* approaches that generate “incidental” leaders instead of “willing” leaders can be seen early in leadership development, where the latter are more able to “absorb” or construct managerial expertise.[38,54,75]

To avoid “incidental” medical leaders, recruitment should be formalized with clear financial incentives, identification of leadership potential should start at an early stage by engaging in conversations with front-line physicians, and these future physician leaders should be supported and moulded through opportunities to lead new initiatives.[2,19,25,38,51,63] In that process, assessment of professionals’ self-efficacy as a predictor of motivation to lead is recommended.[58] Selection of leaders should be part of the overall talent management system[74] and the position should have a clear job description that matches the strategic, structural, and political contexts.[23,34,52,76] Demographics should be considered to avoid management by the “old boys’ club”. [25] The recruitment process should set clear expectations on what is acceptable professional behaviour as a medical leader, in order to be able to enforce these behaviours in case of a mismatch.[76] While the most frequently displayed and among the most valued leadership attributes among physicians is being inspirational, it has the least impact on staff satisfaction.[4] Those physicians who demonstrate interest in quality, patient safety, and overall leadership aptitude should be sought.[34,52,76] Backgrounds as general internists and practicing hospitalists (or other holistic specializations) seem favourable.[28,34]

### *Top management support*

Senior leadership teams, particularly CEOs, manage physicians by nagging, arguing, and reminding them of their responsibilities, i.e. they fail to meaningfully engage medical leaders.[50,77,78] CEOs and senior leadership teams tend to crowd medical leaders’ agendas with numerous committees or “strategic” meetings that are filled with operational, not strategic matters.[34,40,51]

## Conditions affecting medical leadership

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3 A questionnaire study among staff at the NHS concluded that effective leadership practice  
4 (e.g. engaging staff and collaborators in achieving a compelling vision) is correlated with  
5 hospital performance.[1] In addition, there is a correlation between how effectively boards  
6 work with quality of care and how well executive management teams as a consequence  
7 monitor quality and manage operations.[61,67,79] Top-level teams should be stable and  
8 acknowledge physicians' medical expertise and academic competence,[55,78] and foster  
9 collaborative relationships, professional development, effective communication, diffusion of  
10 expert knowledge between managers and professionals, and demonstrate a proactive culture  
11 for decision-making.[20,25,60,66,76,80] They also need to remove barriers to medical  
12 leadership, e.g. reduce the burden of administrative tasks related to information technology,  
13 performance analysis, and financial management; lack of financial incentives; time  
14 commitment pressures; overall lack of support, and challenges tied to the timing, location, and  
15 process of managerial meetings.[19,25,26,29,33,37,42,51] This can be done by setting clear  
16 expectations[51], introducing collective leadership[32] or through hybrid organisations.[81]  
17 The latter resonates well with the idea of professional bureaucracies where staff has greater  
18 influence on decision making than people in formal positions of authority.[32]

### *Strategic leadership development*

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21 Current undergraduate medical education programs provide only limited opportunities for  
22 professional development and neglect strengthening the ethos and professionalism that would  
23 make physicians better fit for the purpose of their work.[34] During their clinical careers, they  
24 are not sufficiently exposed to professionals who are able to develop their managerial  
25 mindset.[33] Management skills are perceived to be in conflict with a medical case-  
26 orientation and interventionist professional action.[43] Previous experiences of being a  
27 manager at the unit level are not enough either – physicians still have the tendency to be  
28 occupied with small-scale problem-solving, which makes it difficult to develop the essential  
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1 Conditions affecting medical leadership

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3 strategic hospital-wide perspective.[33] Even if physicians enter management, they see this  
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5 merely as an intermediate role.[37] Medical leaders feel they are thrown into their roles and  
6  
7 then expected to learn management on their own and on-the-fly.[19,26] Traditional leadership  
8  
9 development programs tend to be offered post-promotion,[73] and emphasize the difference  
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11 between management and leadership, which adds to the problem of translating these to  
12  
13 practical situations where they actually are intertwined.[40] Leadership training is rarely  
14  
15 followed up with concrete opportunities to engage in hospital strategy development.[33]  
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20 The introduction of management competencies needs to start early and focus on taking  
21  
22 initiative, organisational and system understanding, becoming team players, communication,  
23  
24 and shared decision-making.[33,42,78] Leadership development provides four important  
25  
26 opportunities to improve quality and efficiency in healthcare, by (1) increasing the calibre of  
27  
28 the workforce, (2) enhancing efficiency in the organisation's education and development  
29  
30 activities, (3) reducing turnover and related expenses, and (4) focusing organisational  
31  
32 attention on specific strategic priorities.[82] Training should improve leaders abilities to  
33  
34 address system level challenges and benefit the service, not just the individual.[32,83,84]  
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38 Development initiatives create a space for informal conversations that shape attitudes towards  
39  
40 teamwork, safety, management, and working conditions.[28,40,85] Investments in leadership  
41  
42 development should be made at all organisational levels and be seen as part of the strategic  
43  
44 development of an organisation.[32]  
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48 Teaching approaches should move from competency to capability development through  
49  
50 integration with ongoing improvement efforts where the focus is on participants' actual  
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52 challenges as opposed to merely talking about problem solving.[19,35,43,75,76] Everyday  
53  
54 work practices can become opportunities to develop and test new approaches to service  
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56 provision and to acquire management and leadership skills (e.g. via efficient meetings,  
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58 medical teamwork, joint decision-making, and the delegation of responsibilities).[21,43]  
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1 Conditions affecting medical leadership

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3 Inter-professional education and training are critical to improve managerial self-efficacy,  
4 interest, and readiness to be involved in managerial work.[25,38,47,58] Through mentoring,  
5 coaching and networks, medical leaders with similar roles can share experiences, tools, and  
6 strategies.[25,34,35,38]  
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### 12 **Synthesis**

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15 Based on the descriptive themes, we generated a hypothetical model, a critical component of  
16 thematic synthesis.[12] The model illustrates two opposing schemata related to willing vs.  
17 incidental leaders (Figure 4).  
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23 <<<Insert Figure 4 here>>>

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30 The virtuous cycle describes a set of interdependent strategies that help to anchor  
31 management in medicine. The pivotal point is to identify willing leaders who are committed  
32 to continually improve their own management and leadership competencies. They are  
33 nurtured by an embedded leadership development strategy that fosters participatory leadership  
34 practices. Participation cultivates medical engagement among staff and thereby increases  
35 interest in leadership roles and management positions. This, in turn, contributes to favourable  
36 conditions for formal recruitment and expands the recruitment pool of future willing leaders.  
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46 In the vicious cycle, managerial positions are filled by incidental leaders with little interest to  
47 improve their own leadership competencies. The lack of interest is reinforced by disconnected  
48 leadership development efforts that are perceived as irrelevant to the improvement of health  
49 care. Managers mimic historically dominant managerial approaches, i.e. management through  
50 “command and control”, which leads to medical disengagement among staff. Disinterest in  
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1 Conditions affecting medical leadership

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3 leadership roles encourages informal recruitment practices which perpetuates the risk for  
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5 forming incidental leaders.  
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## 8 **DISCUSSION**

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11 This systematic literature review presents a thematic synthesis of the conditions that can either  
12  
13 facilitate or impede the influence of medical leadership on organisational performance. The  
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15 data suggests that it is the nurturing and engagement of willing leaders that facilitate and the  
16  
17 safeguarding strategy of incidental leaders that impede a positive influence on organisational  
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19 performance. This influence is summarized in a model that describes a virtuous cycle of  
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21 management through medicine and a vicious cycle of medical protectionism.  
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26 The findings of this review resonate with the emerging field of research tied to physician or  
27  
28 medical engagement. Medical engagement is defined as a reciprocal relationship between the  
29  
30 individuals and the organisational system: “the active and positive contribution of doctors,  
31  
32 within their normal working roles, to maintaining and enhancing the performance of the  
33  
34 organisation, which itself recognizes this commitment, in supporting and encouraging high  
35  
36 quality care”.<sup>[55]</sup>  
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41 While Spurgeon *et al.*<sup>[76]</sup> ask if it is medical leadership or medical engagement that is needed  
42  
43 for better performance, we suggest that medical engagement is intimately dependent on the  
44  
45 quality of medical leadership. The virtuous cycle of medical leadership illustrates how  
46  
47 medical leadership can intervene at the individual, organisational and system levels to  
48  
49 enhance medical engagement. At the individual level, medical leaders can explicitly use their  
50  
51 medical knowledge to interpret and explain the medical consequences of managerial  
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53 decisions.<sup>[86]</sup> This would demonstrate commitment to improve health care, model an  
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55 integrative view of management and medicine, and subsequently, enhance professional  
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57 identities. At the organisational level, medical leaders should formalize recruitment processes,  
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## Conditions affecting medical leadership

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2  
3 get top management teams to acknowledge and engage medical expertise and academic  
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5 competence, and embed leadership development in medical practice through quality  
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7 improvement. Finally, the highest level of medical leadership, including political decision  
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9 makers, need to develop an inclusive and collaborative culture characterized by openness,  
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11 trust, and respect, by engaging health professionals in the design and monitoring of  
12  
13 performance measures. These combined efforts will not only cultivate medical engagement  
14  
15 and by that improve the performance of individual health care organisations. They will also  
16  
17 enable a shift to new leadership paradigms suitable to the complexity of health care,[87] and  
18  
19 establish conditions favourable for large-system transformation and health care reform.[88]  
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## Implications for research

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26 In terms of future research, the field of medical leadership would benefit from studies  
27  
28 conducted in primary care, that include leaders at other than senior managerial levels, and  
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30 from non-Anglo-American settings. While we came across a few studies on gender balance  
31  
32 and internationalization of the clinical workforce, perspectives on the consequences for  
33  
34 medical leadership are lacking. Qualitative studies could further deepen our understanding of  
35  
36 the relationship between management and medicine in everyday clinical practice in order to  
37  
38 inform leadership development and human resource management efforts. Finally, this review  
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40 alludes to a need to design and evaluate medical leadership development programs that are  
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42 theory-based, evidence-informed, and organisationally embedded.  
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## Limitations

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50 This review is limited by the quality and heterogeneity of included studies. The critical  
51  
52 appraisal shed light on the variation of the quality of reporting, primarily in qualitative  
53  
54 studies. Similar to a sensitivity analysis, studies which scored below average (n=22) were  
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56 revisited in terms of their contribution to the synthesis.[18] We found that these studies: a) did  
57  
58 not strengthen nor disprove the presented synthesis; b) made no conceptual contributions, but  
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1 Conditions affecting medical leadership

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3 were relevant for the transferability of the synthesis findings due to their country of origin,  
4 setting, or study participants; c) made conceptual contributions, but originated from different  
5 disciplines or methods; or d) made conceptual contributions, but originated from key  
6 researchers in the field who prioritized new insights over detailed accounts of their extensive  
7 research efforts. Therefore, excluding these studies would not improve the synthesis, but  
8 would potentially risk relevant contributions.[18] Since the search was timebound to capture  
9 contemporary evidence and limited to three databases, we cannot guarantee that all relevant  
10 articles were found. While plausible correlations between conditions and performance  
11 outcomes are explored, to establish causality requires other approaches to test and determine  
12 the strength of the relationships.  
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## 29 **CONCLUSION**

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32 The identification of the virtuous or vicious cycles of medical leadership can help us better  
33 understand how medical leadership can be both a boon or a barrier to the positive impact that  
34 health care organisations desire for their patients, staff, and society. We can choose to either  
35 create willing leaders through medical engagement or accept incidental leaders through  
36 medical protectionism. This complex challenge involves questioning conventional wisdom on  
37 management and medicine in favour of more participative practices that require long-term  
38 investments at the individual, organisational, and system levels.  
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49 **Authors' contributions:** MS, CS, MB, and PM designed the study. MS conducted the search  
50 with support from a professional research librarian. MS screened titles, key words, and  
51 abstracts for inclusion. All authors screened full texts for inclusion. MS extracted data and  
52 performed line-by-line coding of the included studies. Based on codes, all authors collectively  
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1 Conditions affecting medical leadership

2  
3 developed descriptive and analytic themes. MS drafted the manuscript. All authors read,  
4 revised, contributed to, and approved the final manuscript. PM was the principal investigator.  
5  
6  
7

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17  
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27  
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29  
30

31 **Ethical approval:** An ethical vetting was deemed unnecessary.  
32

33 **Data availability:** Data for this study includes peer-reviewed empirical studies and literature  
34 reviews. The detailed overview of included studies is provided as supplementary information.  
35 Data extraction and analysis was performed in NVivo qualitative data analysis software; QSR  
36 International Pty Ltd. Version 10, 2012. The NVivo file can be made available upon  
37 reasonable request.  
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## 11 **FIGURE LEGENDS**

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15 Figure 1 An explanatory model of factors that mediate the positive and negative effects of  
16 physician leadership (adapted from (Sarto and Veronesi 2016)).  
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20 Figure 2 Study selection flowchart.  
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24 Figure 3 General characteristics of included studies.  
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27 Figure 4 The virtuous and vicious cycles of medical leadership.  
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**Benefits**

- Critical knowledge for decision making process and related improvement of decision making quality
- Higher credibility and related higher adoption of hospital policies by medical staff
- Improved organizational reputation and attraction of talented personnel
- Reinforcement of medical commitment to cost containment
- Greater attention to patient needs due to clinicians' ethical beliefs and professional norms

+ Quality of care

+/- Management of financial and operational resources

+/- Social performance

**Problems**

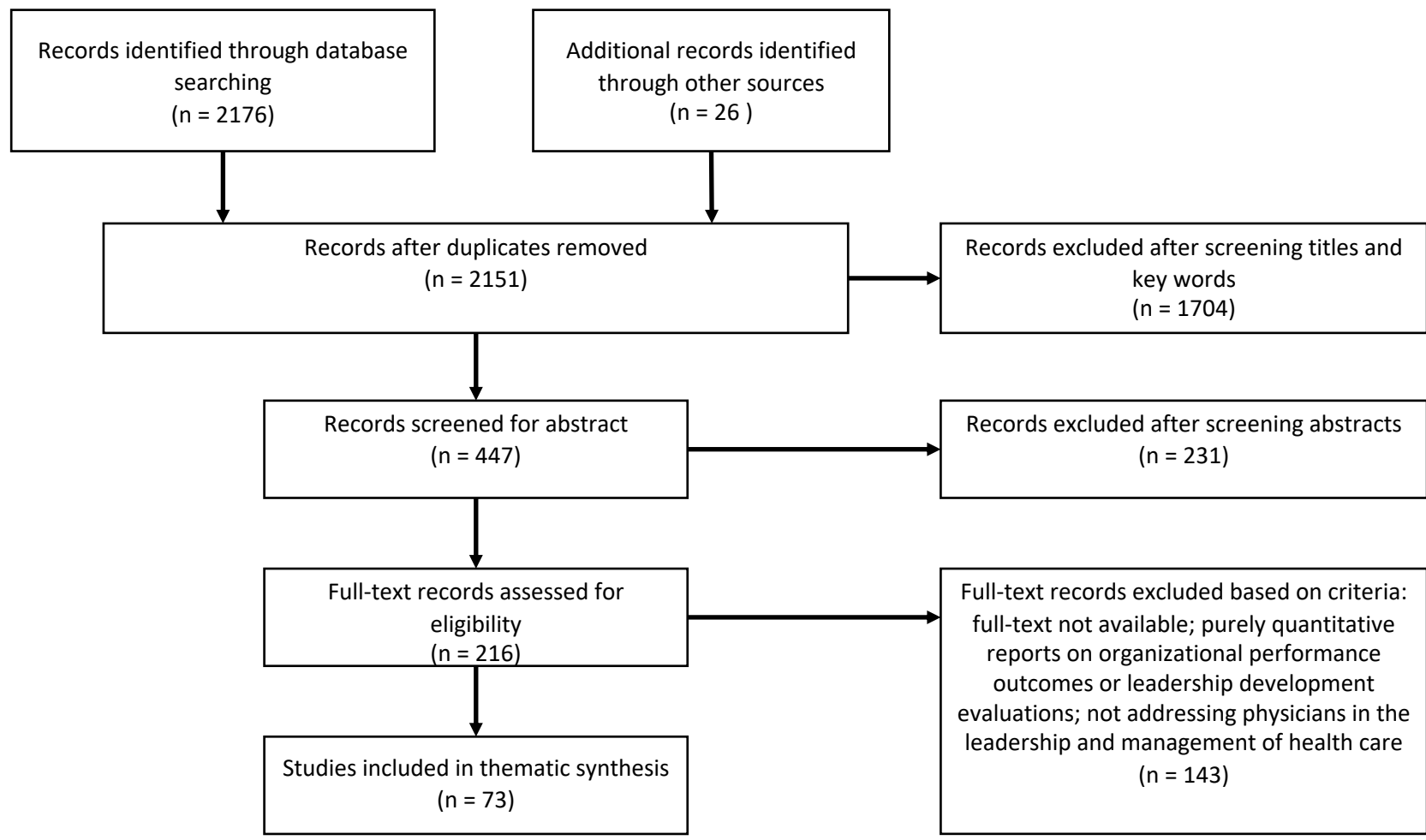
- Conflicts between clinicians and managers
- Role conflict of clinical-managers and related decisions made at the expense of financial performance
- Lack of managerial and accounting expertise
- Conflict of interest of private doctors

For peer review only: <http://bmjopen.bmj.com/site/about/guidelines.xhtml>

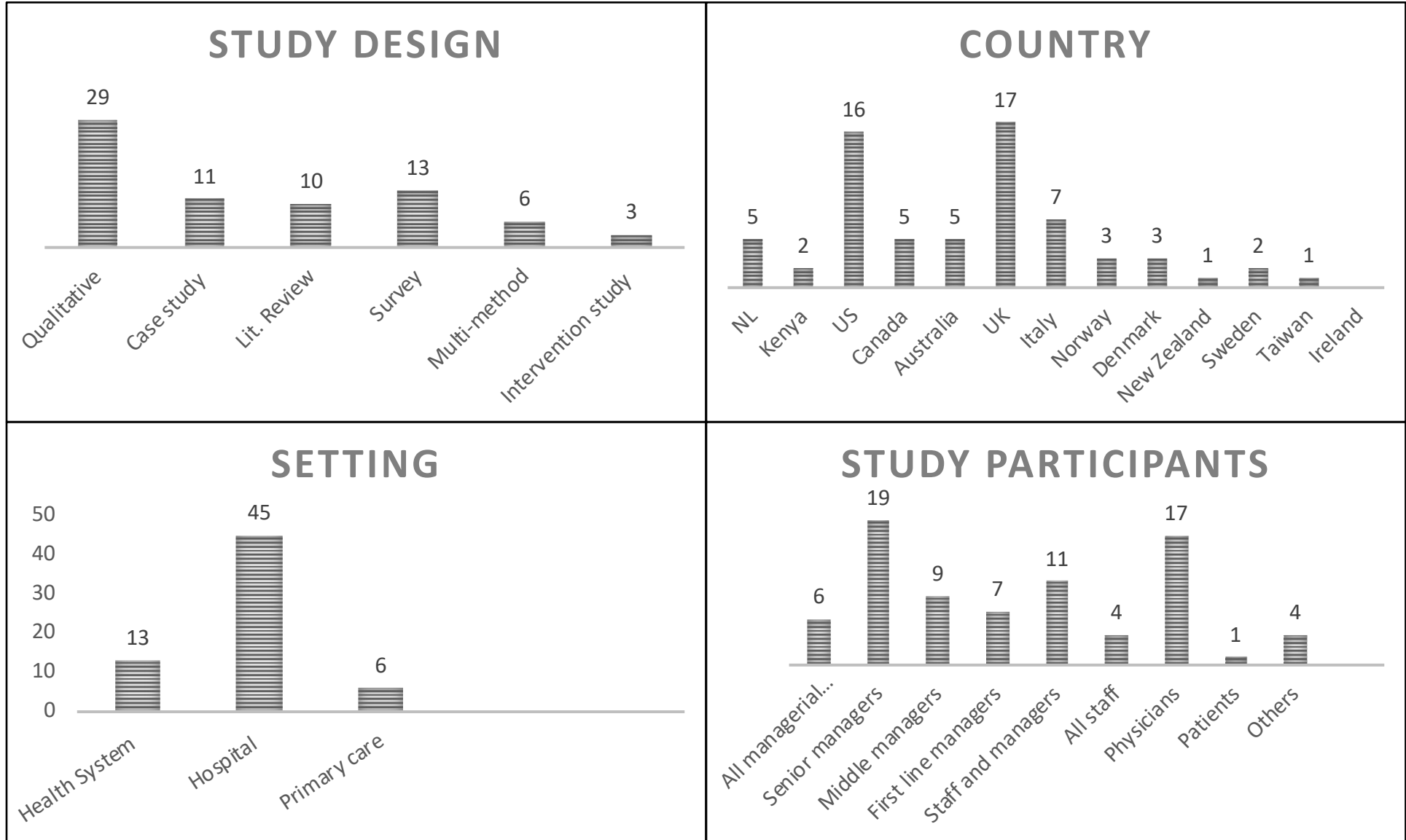
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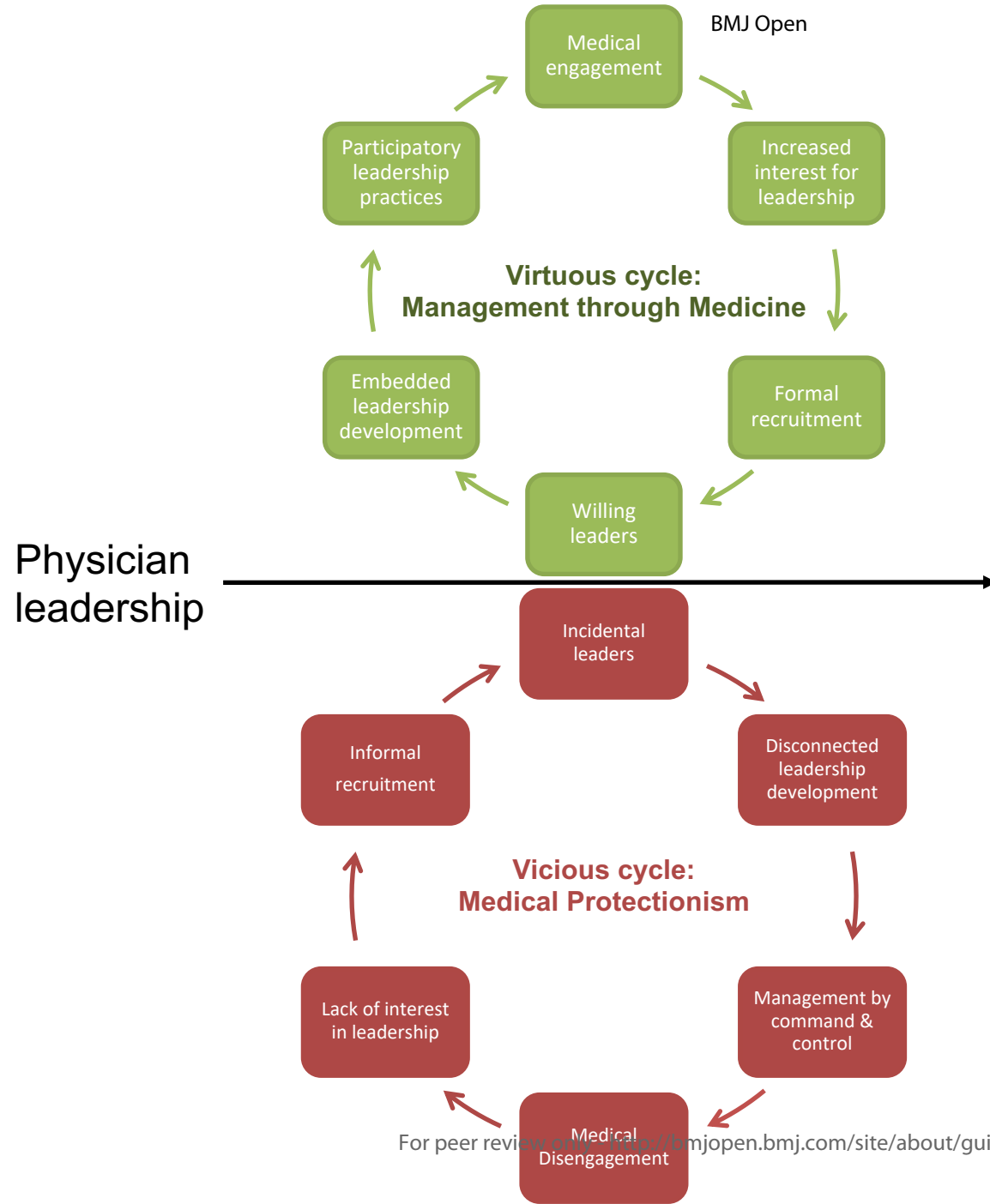








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- Quality of care
- Financial performance
- Staff satisfaction, retention, burnout & performance
- IT adoption
- Approval of reforms

## Conditions affecting medical leadership

## APPENDIX 1 THE ENTREQ STATEMENT

No	Item	Guide and description	Page
1.	Aim	State the research question the synthesis addresses.	4
2.	Synthesis methodology	Identify the synthesis methodology or theoretical framework which underpins the synthesis, and describe the rationale for choice of methodology (e.g. meta-ethnography, thematic synthesis, critical interpretive synthesis, grounded theory synthesis, realist synthesis, meta-aggregation, meta-study, framework synthesis).	5
3.	Approach to searching	Indicate whether the search was pre-planned (comprehensive search strategies to seek all available studies) or iterative (to seek all available concepts until they theoretical saturation is achieved).	5
4.	Inclusion criteria	Specify the inclusion/exclusion criteria (e.g. in terms of population, language, year limits, type of publication, study type).	6
5.	Data sources	Describe the information sources used (e.g. electronic databases (MEDLINE, EMBASE, CINAHL, psycINFO, Econlit), grey literature databases (digital thesis, policy reports), relevant organisational websites, experts, information specialists, generic web searches (Google Scholar) hand searching, reference lists) and when the searches conducted; provide the rationale for using the data sources.	5
6.	Electronic Search strategy	Describe the literature search (e.g. provide electronic search strategies with population terms, clinical or health topic terms, experiential or social phenomena related terms, filters for qualitative research, and search limits).	5
7.	Study screening methods	Describe the process of study screening and sifting (e.g. title, abstract and full text review, number of independent reviewers who screened studies).	6
8.	Study characteristics	Present the characteristics of the included studies (e.g. year of publication, country, population, number of participants, data collection, methodology, analysis, research questions).	7
9.	Study selection	Identify the number of studies screened and provide reasons for study exclusion (e.g. for comprehensive searching, provide numbers of studies screened and reasons for exclusion indicated in a figure/flowchart; for iterative searching describe reasons for study exclusion and inclusion based on modifications to the research question and/or contribution to theory development).	7
10.	Rationale for appraisal	Describe the rationale and approach used to appraise the included studies or selected findings (e.g. assessment of conduct (validity and robustness), assessment of reporting (transparency), assessment of content and utility of the findings).	7
11.	Appraisal items	State the tools, frameworks and criteria used to appraise the studies or selected findings (e.g. Existing tools: CASP, QARI, COREQ, Mays and Pope [25]; reviewer developed tools; describe the domains assessed: research team, study design, data analysis and interpretations, reporting).	7
12.	Appraisal process	Indicate whether the appraisal was conducted independently by more than one reviewer and if consensus was required.	7
13.	Appraisal results	Present results of the quality assessment and indicate which articles, if any, were weighted/excluded based on the assessment and give the rationale.	7, 22-23
14.	Data extraction	Indicate which sections of the primary studies were analysed and how were the data extracted from the primary studies? (e.g. all text under the headings "results /conclusions" were extracted electronically and entered into a computer software).	6
15.	Software	State the computer software used, if any.	7

## Conditions affecting medical leadership

16.	Number of reviewers	Identify who was involved in coding and analysis.	6-7
17.	Coding	Describe the process for coding of data (e.g. line by line coding to search for concepts).	6-7
18.	Study comparison	Describe how were comparisons made within and across studies (e.g. subsequent studies were coded into pre-existing concepts, and new concepts were created when deemed necessary).	N/A
19.	Derivation of themes	Explain whether the process of deriving the themes or constructs was inductive or deductive.	6
20.	Quotations	Provide quotations from the primary studies to illustrate themes/constructs, and identify whether the quotations were participant quotations of the author's interpretation.	N/A
21.	Synthesis output	Present rich, compelling and useful results that go beyond a summary of the primary studies (e.g. new interpretation, models of evidence, conceptual models, analytical framework, development of a new theory or construct).	7-21

## Appendix 2 Search strategy

### Web of Science

TOPIC: ("clinical manage\*" OR "medical manage\*" OR "clinical leader\*" or "medical leader\*" OR "physician executive\*" OR "medical director\*") AND TOPIC: (health care quality OR hospital performance) NOT TOPIC: (disease)

Limits:

Publication date: 2006.01.01-2020.01.21

English

### PubMed

(((((("physician executives"[MeSH Terms] OR ("physician"[All Fields] AND "executives"[All Fields]) OR "physician executives"[All Fields] OR ("physician"[All Fields] AND "executive"[All Fields]) OR "physician executive"[All Fields]) AND ("2006/01/01"[PDAT] : "2020/01/21"[PDAT]) AND English[lang]) OR (((clinical[All Fields] AND ("leadership"[MeSH Terms] OR "leadership"[All Fields])) OR (medical[All Fields] AND ("leadership"[MeSH Terms] OR "leadership"[All Fields]))) AND ("2006/01/01"[PDAT] : "2020/01/21"[PDAT]) AND English[lang])) AND (("delivery of health care"[MeSH Terms] OR ("delivery"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "delivery of health care"[All Fields] OR ("health"[All Fields] AND "care"[All Fields]) OR "health care"[All Fields]) OR ("delivery of health care"[MeSH Terms] OR ("delivery"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "delivery of health care"[All Fields] OR "healthcare"[All Fields]))) AND (((("hospitals"[MeSH Terms] OR "hospitals"[All Fields] OR "hospital"[All Fields]) AND performance[All Fields]) OR ("quality of health care"[MeSH Terms] OR ("quality"[All Fields] AND "health"[All Fields] AND "care"[All Fields]) OR "quality of health care"[All Fields]))) AND (("physicians"[MeSH Terms] OR "physicians"[All Fields] OR "physician"[All Fields]) OR ("physicians"[MeSH Terms] OR "physicians"[All Fields] OR "doctor"[All Fields])) AND ("2006/01/01"[PDAT] : "2020/01/21"[PDAT])

### Psychinfo

(((((("clinical manage\*" or "medical manage\*" or "clinical leader\*" or "medical leader\*" or "physician executive\*" or "medical director\*") and health care quality) or hospital performance or delivery of health care) not disease).af.

Limits: English

Peer reviewed

2018-2020









## Items reported in the included literature reviews (Informed by (Smith, Devane, Begley, &amp; Clarke, 2011) and (Shea et al., 2007))

Item	Literature reviews									
	1	2	11	15	18	35	48	51	52	66
1. Aim	To clarify the term "physician engagement."	To review the literature on the effectiveness of programmes to support leadership, the relationship between clinical leadership and integrated primary care, and important leader- ship skills for integrated primary care practice	To summarize the results of studies which use outcome measures from clinical registries to implement and monitor QI initiatives. The second objective is to identify a) facilitators and/or barriers that contribute to the realization of QI efforts, and b) how outcomes are being used as a catalyst to change outcomes over time.	To provide an overview of the scientific literature regarding the definitions of medical leadership, the activities and roles performed by a medical leader, the required knowledge and skills, and the influential factors	To determine if there is an association between leaders having a medical background and management performance, in terms of organisational performance or patient outcomes.	To map out and critically appraise quantitatively-oriented studies analysing the association between clinicians' involvement in senior leadership positions (i.e. CEO, top management and board of directors) and hospital performance.	To present and discuss the streams of knowledge regarding how management can influence the quality and sustainability of health systems and organizations.	Review the evidence on how a systematic approach to talent development has important organizational outcomes,	To provide a comprehensive overview of the studies dealing with the impact of management on professional control.	To examine the use of the term medical engagement and the existence of any empirical evidence for its linkage to organisational or clinical aspects of performance.
2. Data bases searched	3	4	3	8	3	1	4	-	4	8
3. Keywords, search terms	*	*	*	*	*	*	*	-	*	*
4. Years searched	*	*	*	*	*	*	-	-	*	*
5. Applied restrictions	*	*	*	*	*	*	*	-	*	*
6. Selection process	*	*	*	*	*	*	-	-	*	*
7. Eligibility criteria	*	*	*	*	*	*	-	-	-	*
8. No. of reviewers	*	*	*	*	*	*	*	*	*	*
9. No. of included studies	*	*	*	*	*	*	*	-	-	*
10. Quality assessment of included studies	-	*	*	-	*	-	-	-	-	-
11. Methods for data extraction	*	*	*	*	*	*	-	-	-	-
12. Methods for data analysis/synthesis	*	*	*	*	*	*	-	-	-	-
13. Sources of funding	-	*	*	-	-	*	*	*	*	*
14. Conflict of interest	*	*	*	-	*	*	*	*	-	-
<b>Total items reported</b>	<b>12</b>	<b>14</b>	<b>14</b>	<b>11</b>	<b>13</b>	<b>13</b>	<b>7</b>	<b>4</b>	<b>8</b>	<b>10</b>

Mixed methods appraisal tool (MMAT) (Hong et al., 2018)

Item	Quantitative descriptive studies																	
	10	20	24	32	33	39	40	41	42	44	46	56	58	59	62	69	70	73
Is the sampling strategy relevant to address the research question?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes
Is the sample representative of the target population?	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Can't tell	No	Yes	Can't tell	No	Yes	Yes
Are the measurements appropriate?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is the risk of non-responsible bias low?	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Can't tell	Can't tell	Yes	Can't tell	Yes	Can't tell	Can't tell	No	No	Yes	Can't tell
Is the statistical analysis appropriate to answer the research question?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Item	Mixed methods	
	21	63
Is there an adequate rationale for using mixed methods design to address the research question?	Yes	Yes
Are there different components of the study effectively integrated to answer the research question?	Yes	Yes
Are the outputs of the integration of qualitative and quantitative components adequately interpreted?	Yes	Yes
Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?	N/A	Yes
Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?	Yes	Yes

Item	Non-randomized studies
	30
Are the participants representatives of the target population?	Yes
Are the measurements appropriate regarding both the outcome and intervention (or exposure)?	Yes
Are there complete outcome data?	Yes
Are the confounders accounted for in the design and analysis?	No
During the study period, is the intervention administered as intended?	Yes

### Analysis of the studies scoring lower than the average

The numbering is based on [Appendix 4: Detailed overview of the included studies](#) in order to avoid potential changes tied to reference management in the main manuscript.

No	Reference	Authors' comment
	<b>QUALITATIVE STUDIES</b>	
6	Berghout MA, Oldenhof L, van der Scheer WK, et al. From context to contexting: professional identity un/doing in a medical leadership development programme. <i>Sociol Health Illn</i> Published Online First: October 2019.	Makes relevant conceptual contributions. An ethnographic study from the Netherlands, important for transferability of findings.
12	Berghout MA, Oldenhof L, Fabbricotti IN, et al. Discursively framing physicians as leaders: Institutional work to reconfigure medical professionalism. <i>Soc Sci Med</i> 2018;212:68–75.	Makes no unique conceptual contributions. A qualitative study based on observations and document analysis from the Netherlands, important for transferability of findings.
8	Jorm C, Hudson R, Wallace Am E. Turning attention to clinician engagement in Victoria. <i>Aust Health Rev</i> 2019;43:123–5.	Makes important conceptual contributions. Seems to be poorly reported due to the style of the publication/journal but is based on an extensive study from Australia
23	Kerrissey M, Satterstrom P, Leydon N, et al. Integrating: A managerial practice that enables implementation in fragmented health care environments. <i>Health Care Manage Rev</i> 2017;42:213–25.	Makes no unique conceptual contribution. Relevant due to having its setting in primary care which has bearing on the transferability of the synthesis.

1 2 3	25	Spehar I, Frich JC, Kjekshus LE. Clinicians' experiences of becoming a clinical manager: a qualitative study. <i>BMC Health Serv Res</i> 2012;12:421.	Makes no unique conceptual contribution. Relevant due to having its setting in primary care and from Norway which has bearing on the transferability of the synthesis.
4 5 6 7	29	Denis J-L, van Gestel N. Medical doctors in healthcare leadership: theoretical and practical challenges. <i>BMC Health Serv Res</i> 2016;16:158–69.	Makes no unique conceptual contribution.
8 9 10 11	31	Lega F, Sartirana M. Making doctors manage... but how? Recent developments in the Italian NHS. <i>BMC Health Serv Res</i> 2016;16.	Makes minor conceptual contribution. Relevant due to being conducted in Italy which has bearing on the transferability of the synthesis.
12 13 14 15 16 17	34	Noordegraaf M, Schneider MME, Van Rensen ELJ, <i>et al.</i> Cultural Complementarity: Reshaping professional and organizational logics in developing frontline medical leadership. <i>Public Manag Rev</i> 2016;18:1111–37.	Makes important conceptual contributions tied to the field of sociology of professions. Relevant due to being conducted in the Netherlands and focused on physicians in residency training which has bearing on the transferability of the synthesis.
18 19 20 21	36	Bresnen M, Hyde P, Hodgson D, <i>et al.</i> Leadership talk: From managerialism to leaderism in health care after the crash. <i>Leadership</i> 2015;11:451–70.	Makes no unique conceptual contribution.
22 23 24 25 26	38	Martin G, Beech N, MacIntosh R, <i>et al.</i> Potential challenges facing distributed leadership in health care: Evidence from the UK National Health Service. <i>Sociol Health Illn</i> 2015;37:14–29.	Makes no unique conceptual contribution. Relevant due to having its setting in primary and secondary care which has bearing on the transferability of the synthesis.
27 28 29 30	45	Moffatt F, Martin P, Timmons S. Constructing notions of healthcare productivity: The call for a new professionalism? <i>Sociol Health Illn</i> 2014;36:686–702.	Makes no unique conceptual contribution.
31 32	49	Fulop L. Leadership , clinician managers and a thing called “ hybridity ”. <i>J Health Organ Manag</i> 2012;26:578–604.	Makes no unique conceptual contribution.
33 34 35 36	55	Ham C, Clark J, Spurgeon P, <i>et al.</i> Doctors who become chief executives in the NHS: from keen amateurs to skilled professionals. <i>J R Soc Med</i> 2011;104:113–9.	Makes relevant conceptual contributions and is written by key authors in the field. Poor reporting score was most likely tied to the requirements or limitations of the journal.
37 38 39 40 41 42	60	Hayes C, Yousefi V, Wallington T, <i>et al.</i> Case study of physician leaders in quality and patient safety, and the development of a physician leadership network. <i>Healthc Q</i> 2010;13 Spec No:68–73.	Makes minor conceptual contribution with its unique focus on physicians in quality and safety.

64	Waring J, Currie G. Managing expert knowledge: Organizational challenges and managerial futures for the UK medical profession. <i>Organ Stud</i> 2009;30:755–78.	Makes relevant conceptual contributions in terms of knowledge management. Poor reporting score is likely tied to a publication in a different discipline.
65	Epstein AL, Bard MA. Selecting Physician Leaders for Clinical Service Lines: Critical Success Factors. <i>Acad Med</i> 2008;83:226–34.	Makes no unique conceptual contribution.
67	Lega F. Lights and shades in the managerialization of the Italian National Health Service. <i>Heal Serv Manag Res</i> 2008;21:248–61.	Makes no unique conceptual contribution. Relevant due to being conducted in Italy which has bearing on the transferability of the synthesis.
71	Sorensen R, Iedema R. Redefining accountability in health care: managing the plurality of medical interests. <i>Heal An Interdiscip J Soc Study Heal Illn Med</i> 2008;12:87–106.	Makes important conceptual contributions. Relevant also due to its ethnographic study design.
<b>LITERATURE REVIEWS</b>		
48	Lega F, Prenestini A, Spurgeon P. Is Management Essential to Improving the Performance and Sustainability of Health Care Systems and Organizations? A Systematic Review and a Roadmap for Future Studies Review of Literature. <i>Value Heal</i> 2013;16:S46–51.	Makes important conceptual contributions due to being one of the first literature reviews in the field but adds little in the light on more recent reviews.
51	Mallon WT, Buckley PF. The current state and future possibilities of recruiting leaders of academic health centers. <i>Acad Med</i> 2012;87:1171–6.	Makes a minor contribution in terms of the importance of talent management thinking in recruitment of medical leaders. Published in a reputable journal but with very limited reporting possibly tied to the word limits.
<b>QUANTITATIVE DESCRIPTIVE STUDIES</b>		
41	Spurgeon P, Long P, Clark J, <i>et al.</i> Do we need medical leadership or medical engagement? <i>Leadersh Heal Serv</i> 2015;28:173–84	Makes important conceptual contributions in terms of questioning the idea of medical leadership by introducing the concept of medical engagement. Given the authors' primary interest in the medical engagement scale, other aspects of the study were not elaborated enough.
46	Nelson MF, Merriman CS, Magnusson PT, <i>et al.</i> Creating a physician-led quality imperative. <i>Am J Med Qual</i> 2014;29:508–16.	Makes no unique conceptual contribution.

## Conditions affecting medical leadership

**APPENDIX 4 DETAILED OVERVIEW OF THE INCLUDED STUDIES (IN ORDER OF PUBLICATION DATE)**

No	Reference	Study design	Country	Setting	Study participants
1.	Perreira, T., <i>et al.</i> (2019)	Concept analysis using literature review	N/A	N/A	N/A
2.	Nieuwboer, M., <i>et al.</i> (2019)	Systematic literature review	N/A	N/A	N/A
3.	Boyle, T., <i>et al.</i> (2019)	Semi-structured interviews (n=10)	Canada	Hospital	Senior health care executives
4.	Vazquez, C. (2019)	Semi-structured in-depth individual interviews (n=4)	USA	Non-profit teaching hospitals	Physician leaders responsible for pediatric heart programs
5.	Keller, E., <i>et al.</i> (2019)	Qualitative mixed methods: Semi-structured interviews (n=40) and observations	USA	Academic hospital	Physicians Administrators
6.	Berghout, M., <i>et al.</i> (2019)	Ethnographic study (n=23): Observations (100 hours)	The Netherlands	Hospital	Participants of a medical leadership development program (all physicians)
7.	Van de Riet, M., <i>et al.</i> (2019)	Interview study (n=39)	The Netherlands	General district hospital	Physicians Nurses Laboratory technicians Managers
8.	Jorm, C., <i>et al.</i> (2019)	Scoping study: Literature review, interviews (n>100), survey (n=1800)	Australia	Health system	Clinicians Executives

## Conditions affecting medical leadership

9.	McHugh, S. <i>et al.</i> (2019)	Multiple case study (n=6): Documents, key stakeholder interviews (n=36)	Ireland	Health system	Managers, patient advocates, doctors, nurses, private ambulance representatives, general practitioners, private hospital representatives, hospital campaigners, local media representatives, local politicians
10.	Ahnfeldt-Mollerup, P., <i>et al.</i> (2018)	Survey (n=352), registrar of quality reports	Denmark	Primary care	General Practitioners
11.	Kampstra, M., <i>et al.</i> (2018)	Systematic literature review	N/A	N/A	N/A
12.	Berghout, M., <i>et al.</i> (2018).	Qualitative: observations and document analysis	The Netherlands	Health system	Opinion-making physicians
13.	Nzinga, J., McGivern, G., & English, M. (2018).	Case study: ethnographic observation (480 h), interviews, focus groups (n=61)	Kenya	Hospital	Mid-level departmental leaders, nurses in charge of inpatient wards, senior managers, frontline workers
14.	Yanchus, N. J., <i>et al.</i> (2018).	Qualitative survey comments	US	Health system	Physicians
15.	Berghout, M. A., <i>et al.</i> (2017).	Literature review	N/A	Hospital	Physicians in managerial or leadership roles
16.	Bharwani, A., <i>et al.</i> (2017).	Interview study (n=77)	Canada	Academic medicine system	Trainees, mid-level university leaders, senior medical clinical leaders, senior university leaders, medical scientists, senior

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					executives and directors
17.	Canaway, R., <i>et al.</i> (2017).	Semi-structured interviews (n=17)	Australia	Hospital	Senior management
18.	Clay-Williams, R., <i>et al.</i> (2017).	Literature review	N/A	N/A	Senior management
19.	Dickinson, H. <i>et al.</i> (2017).	Case study: 9 cases, 150 interviews	UK	Hospital	Doctors, nurses and managers
20.	Giri, P., Aylott, J., & Kilner, K. (2017).	Quantitative: survey study (n=249)	UK	N/A	Faculty of Occupational Medicine
21.	Ileri, S. K., <i>et al.</i> (2017).	Multi-method: 25 interviews, survey (n=292)	UK & Kenya	Hospital	Middle and senior management
22.	Jones, L., <i>et al.</i> (2017).	Qualitative: interviews (n=65), observations (60 hours), document analysis	UK	Hospital	Senior management
23.	Kerrissey, M., <i>et al.</i> (2017).	Case study: 16 clinics, 18 interviews	US	Primary care	All staff, interviews with heads of clinics
24.	Macinati, M. S., Cantaluppi, G., & Rizzo, M. G. (2017).	Multi-method study: literature review, performance data, unstructured interviews, questionnaire n=72	Italy	Hospital	Physicians
25.	Spehar, I., <i>et al.</i> (2017).	Interview study: Focus group interviews with 17 GPs	Norway	Primary care	Physicians
26.	Storkholm, M. <i>et al.</i> (2017).	Interview study (n=30)	Denmark	Hospital	Staff and managers



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27.	Waring, J., & Crompton, A. (2017).	Case study: non-participant observation's (90 hours), semi-structured interviews (n=34), focus groups (n=3) and document analysis	UK	Hospital	Senior managers, senior medical and nursing leaders, quality and safety managers, senior human resources, communications and operations managers, nurses, doctors, departmental managers, and support workers.
28.	Clark, K. D., <i>et al.</i> (2016).	Case study: Observational cross-case comparative study (19 practices)	US	Primary care	Staff and leaders at all levels
29.	Denis, J.-L., & van Gestel, N. (2016).	Qualitative: Document analysis	The Netherlands and Canada	Health system	N/A
30.	Kristensen, S., <i>et al.</i> (2016).	Intervention study: A repeated cross-sectional experimental study, 2 surveys	Denmark	Hospital	Staff and managers
31.	Lega, F., & Sartirana, M. (2016).	Qualitative: literature review, action-research and field investigations	Italy	Hospital	N/A
32.	Macinati, M. S., Bozzi, S., & Rizzo, M. G. (2016).	Multi-method: Literature review to develop hypothesis, performance data, unstructured interviews, questionnaire (n=65)	Italy	Hospital	First and middle managers

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33.	Macinati, M. S., & Rizzo, M. G. (2016).	Survey n=53	Italy	Hospital	General manager, administrative officer, controller, clinical managers
34.	Noordegraaf, M., <i>et al.</i> (2016).	Qualitative: document analysis, observation, interviews (n=38)	The Netherlands	Hospital	Residents and program directors
35.	Sarto, F., & Veronesi, G. (2016).	Literature review	N/A	Hospital	Senior management
36.	Bresnen, M., <i>et al.</i> (2015).	Qualitative: n=85 interviews with 68 respondents, 54 hours of observations	UK	Two hospitals and a trust providing mental health and community services	Medical, general, and functional managers.
37.	Burgess, N., <i>et al.</i> (2015).	Interview study (n=91)	UK	Hospital	Middle managers
38.	Martin, G., <i>et al.</i> (2015).	Interview study: 56 focus group interviews, 46 individual interviews, 25 in-depth individual interviews	UK	Primary and secondary care	Staff and managers
39.	Mascia, D., <i>et al.</i> (2015).	Survey, n=791	Italy	Hospital	Physicians
40.	Quinn, J. F. (2015).	Survey, (n=677)	US	N/A	Senior managers
41.	Spurgeon, P., <i>et al.</i> (2015).	Survey, UK 30 trusts, Australia and New Zealand 4 sites	UK, Australia and New Zealand	Hospital	All staff
42.	Tsai, T. C., <i>et al.</i> (2015).	Survey (n=722 in the US, n=132 in the UK)	UK & US	Hospital	First line and senior managers

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43.	Damschroder, L. J., <i>et al.</i> (2014).	Interview study (n=62)	US	Hospital	Network-level and facility-level executives, managers, front-line providers and staff
44.	Macinati, M. S., & Rizzo, M. G. (2014). <i>et al.</i>	Questionnaire (n=70)	Italy	Hospital	First and middle managers
45.	Moffatt, F., Martin, P., & Timmons, S. (2014).	Qualitative: Document analysis	UK	Health system	N/A
46.	Nelson, M. F., <i>et al.</i> (2014)	Intervention study	US	Hospital	Physicians, nurse managers, administration, and board members
47.	Nicol, E. D., Mohanna, K., & Cowpe, J. (2014).	Interview study (n=20)	UK	Health system	Senior management
48.	Lega, F., Prenestini, A., & Spurgeon, P. (2013).	Literature review	N/A	N/A	N/A
49.	Fulop, L. (2012).	Interview study (n=31)	Australia	Hospital	Clinical managers
50.	Howard, J., <i>et al.</i> (2012).	Case study: observation notes, meeting recordings, interviews (n=8)	US	Primary care	Physician leaders
51.	Mallon, W. T., & Buckley, P. F. (2012).	Literature review	N/A	Hospital	Senior management
52.	Numerato, D., Salvatore, D., & Fattore, G. (2012).	Literature review	N/A	N/A	N/A
53.	Spehar, I., Frich, J. C., &	Qualitative: In-depth interviews (n=30) and	Norway	Hospital	First line and middle managers

## Conditions affecting medical leadership

	Kjekshus, L. E. (2012).	participant observations (n=20)			
54.	Choi, S., <i>et al.</i> (2011).	Single case study: 22 interviews, 22 hours of observations and document analysis	Sweden	Hospital	Senior management
55.	Ham, C., <i>et al.</i> (2011).	Interview study (n=20)	UK	Health system	Senior management
56.	Lin, B. Y.-J., <i>et al.</i> (2011).	Survey (n=448)	Taiwan	Hospital	Staff and middle managers
57.	Snell, A. J., Briscoe, D., & Dickson, G. (2011).	Interviews (n=51)	Canada	N/A	Physicians who have attended leadership development courses
58.	Spurgeon, P., Mazelan, P. M., & Barwell, F. (2011).	Survey: (n=30 secondary care trusts)	UK	Secondary care trusts	Physicians
59.	Albert, K., Sherman, B., & Backus, B. (2010).	Intervention study	US	Hospital	First line and middle managers
60.	Hayes, C., <i>et al.</i> (2010).	Case study of four quality leaders	Canada	Hospital	Middle managers
61.	von Knorring, M., de Rijk, A., & Alexanderson, K. (2010).	Interview study (n=18)	Sweden	Health system	Senior management
62.	Jiang, H. J., <i>et al.</i> (2009).	Quantitative (n=562)	US	Hospitals and health system	Senior management
63.	Johansen, M. S., & Gjerberg, E. (2009).	Multi-method (interviews 44; survey 166)	Norway	Hospital	Managers from different levels

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64.	Waring, J., & Currie, G. (2009).	Case study (observations 200hrs, semi-structured interviews n=43)	UK	Hospital	Hospital managers, senior physician leaders, nursing director, senior physicians, staff
65.	Epstein, A. L., & Bard, M. A. (2008).	Interview study (n=68)	US	Hospital	Middle managers
66.	Ham, Chris, & Dickinson, H. (2008).	Literature review	N/A	N/A	N/A
67.	Lega, F. (2008).	Qualitative: Literature review, action-research and field investigations	Italy	Health system	N/A
68.	McAlearney, A. S. (2008).	Interview study (n=200)	US	Health system	Hospital and health system managers and executives, academic experts, consultants, association reps, vendors of leadership development programs, program participants
69.	Menaker, R., & Bahn, R. S. (2008).	Survey (n=314)	US	Hospital	Physicians and senior managers
70.	Shipton, H., <i>et al.</i> (2008).	Survey (n=17 949)	UK	Hospital	Staff
71.	Sorensen, R., & Iedema, R. (2008).	Ethnographic study: observation, interviews, focus groups (n=89)	Australia	Hospital	Medical managers, physicians, nursing managers, nurses, patients, other external palliative care specialists

## Conditions affecting medical leadership

72.	Waring, J. (2007).	Case study (observations 200hrs, semi-structured interviews n=43)	UK	Hospital	Hospital managers, senior physician leaders, nursing director, senior physicians, staff
73.	Prybil, L. D. (2006).	Quantitative (14 hospitals)	US	Hospitals	N/A

For peer review only