

MEASURING MEDICAL DOCTOR ACTIVATION IN ACADEMIC MEDICINE IN AUSTRALIA AND THE USA

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STATEMENT OF ORIGINALITY

I hereby declare that this submission is my own work and to the best of my knowledge it contains no materials previously published or written by another person, or substantial proportions of material which have been accepted for the award of any other degree or diploma at Macquarie University or any other educational institution. Any contribution made to the research by others, with whom I have worked with at Macquarie University or elsewhere, is explicitly acknowledged in the thesis.

I also declare that the intellectual content of this thesis is the product of my own work, except to the extent that the assistance from others in the project's design and conception or in style, presentation and linguistic expression is acknowledged.

The work is governed by ethics approval from the Macquarie University Human Research Ethics Committee REF#520211031828797.

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ABSTRACT

Despite general acceptance that clinician engagement delivers positive outcomes for healthcare organisations, uniform understanding of the concept and ability to effectively measure and link it to outcomes remains limited. Drawing on the literature and the concept of the valid and reliable Patient Activation Measure, this study conceptualises a defined and measurable concept of 'doctor activation'. Doctor activation was defined for this purpose as *the ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient-centred care*. The study developed - through an evidence-based, co-production process - a new, purpose-designed survey, the Measure of Doctor Activation (MD-A). The MD-A was implemented at two academic health systems in Australia and the USA and evaluated for validity and reliability as a tool. Finally, the results were analysed in concert with semi-structured interview findings to provide a two-country and site comparison of doctor activation. The MD-A was shown to be a valid and reliable, 18-item scale for measuring activation of medical doctors. Differences were demonstrated in predictors and detractors of activation at the two sites, given their different contexts and levels of maturity as academic health systems. The study demonstrated a correlation between doctor activation and tangible results being delivered for the organisation (as measured by initiation and leadership of new model of care, quality improvement or strategic initiatives). In summary, the MD-A is a valid, reliable, and potentially high utility tool to measure the activation level of doctors across organisations, countries, and contexts, with a view to continuous improvement.

GLOSSARY OF ABBREVIATIONS

AHSC	Academic Health Sciences Centre
AHC	Academic Health Centre
AMC	Academic Medical Centre
CEC	Clinical Executive Committee
CFA	Confirmatory Factor Analysis
CLC	Clinical Leadership Council
eMR	electronic medical record
EFA	Exploratory Factor Analysis
FPP	Faculty Practice Plan
HR	Human Resources
IT	Information Technology
MD-A	Measure of Doctor Activation
MES	Medical Engagement Scale
NHS	National Health Service
PAM	Patient Activation Measure
RVU	Relative Value Units
USA	United States of America
UWES	Utrecht Work Engagement Scale

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CHAPTER 1: INTRODUCTION

1.1 Importance of the research project

Healthcare systems globally are grappling with significant challenges in the increasing burden of chronic disease, rising costs associated with the provision of healthcare, and unwarranted variation in patient outcomes, amongst a raft of others. Medical professionals are in a unique position to develop and champion solutions to address such problems. Unfortunately, few doctors find themselves able, or adequately supported by their health systems, to do so. Greater tangible doctor engagement - broadly defined as the active and positive contribution of medical professionals to sustaining or improving the performance of their workplace [1-3] - is critical if health system transformation is to be achieved [4]. A key resultant policy question for which there is yet an inadequate answer is, what does it take for doctors to become effective and active leaders in the transformation of healthcare?

There is substantial interest in fostering medical doctor engagement in academic healthcare organisations and systems globally, given its demonstrated role in delivering better quality care and outcomes, cost reduction, successful implementation of improvement initiatives, better overall academic medical doctor performance, and higher retention of doctors [5-12]. However, despite general acceptance that doctor engagement delivers positive outcomes for hospitals and academic health systems, uniform understanding of the concept and ability to effectively measure and link it to outcomes remains limited [2, 10].

At the system level, the broad use of clinician engagement as a construct makes it difficult to measure and to deduce links to outcomes [10]. Similarly, from the perspective of the academic medical doctor, the lack of clarity on how to 'engage' and lack of encouragement and incentive to lead transformation, given the increasingly broad scope of their roles and potential for burnout, may be a missed opportunity to advance health systems [4, 13]. For the purposes of this study 'academic medical doctors' are defined as those simultaneously practicing across two or more of the areas of clinical care, teaching, and research expected in an academic healthcare delivery environment.

In a comprehensive hospital physician engagement scoping review, it was found that the 9 item Utrecht Work Engagement Scale (UWES) was the overwhelmingly dominant tool utilised when measuring doctor engagement [10]. Unfortunately, this measurement tool is not fit for purpose: it is not designed specifically for doctors nor the healthcare industry; it does not link engagement with organisational outcomes; and it cannot be applied effectively in the Australian context where the majority of medical professionals are not employees [10]. In reviewing the literature [10], it could be argued that no tool for measuring doctor engagement in a useful way - across cultures and contexts - currently exists.

Measuring doctor ‘activation’ has been proposed as a novel and potentially useful and relatively well defined concept [4] to address these issues. As analogous to patient activation, which has been demonstrated to positively correlate with a patient’s healthcare outcomes [14, 15], doctor activation is proposed as a measure linked to the delivery of high value care and health system transformation. The short-form (13 item) patient activation measure (PAM) is a reliable and valid tool in assessing a patient’s knowledge, skills, and confidence in managing their own health [14, 15]. Higher PAM scores have been repeatedly associated with effective preventive care, use of health information and self-management; positive health outcomes and appropriate use of and effective interactions in healthcare settings [14, 16]. For the purposes of this study, a definition of doctor activation has been derived from a combination of the literature, interviews and the co-design process as: *the ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient-centred care*. High value, or value-based care is a contemporary, strategic approach to redesigning healthcare delivery, that involves achieving measured improvement in health outcomes relative to the resources involved in doing so [17-20].

Considering the above, the development and validation of a tool specifically designed to measure doctor activation may be transformational in its potential to identify doctors who are well prepared and equipped to partner with their organisations to deliver positive changes and outcomes. Such a tool could also identify those that may need support or intervention to increase activation, whilst also enabling the measurement of the impact of organisational initiatives designed to increase doctor engagement. The tool would ultimately aim to be globally applicable to compare the various ways different health systems engage with doctors and aim to improve engagement. It would also allow for broad accessibility and benchmarking across cultures and contexts.

1.2 Context and rationale for the study

The research was focused in two Academic Health Sciences Centres in Australia and the United States of America (USA) respectively. The academic healthcare setting was chosen given its tripartite mission of clinical care, teaching, and research, which necessitates high levels of active doctor engagement whilst simultaneously creating an expectation of broad-based delivery by doctors.

The concept and implementation of Academic Health Sciences Centres (AHSCs) in Australia (akin to Academic Medical Centres in the USA) is relatively immature. Although public hospitals are generally affiliated with universities, true integration is rarely achieved between AHSC partners, with large bureaucracies tending to work at parallel and sometimes competitive purposes. The AHSC model in Australia has largely been pursued with the goal of advancing clinical translational research. There is little opportunity for the fully integrated,

University owned model, given the dominance of the public hospital system and its independence from higher education. Academic healthcare in Australia is therefore routinely delivered in public teaching hospitals, with the distinct disadvantage of being unable to engage many surgeons who do a large proportion of their work in the private sector. Regardless of the structural model however, tangible doctor engagement remains a pivotal tenant of success. AHSCs in Australia are in an emergent state of development, with a dominant focus on governance and structure rather than implementation of strategic goals and pursuit of desired outcomes [21]. Because the AHSC model isn't well developed in Australia, a country with a more mature system was pursued, to provide a point of contrast.

The birth of the Academic Medical Centre (AMC) in the United States of America occurred in the 1870s where two universities (the University of Michigan and the University of Pennsylvania) endeavoured to build their own teaching hospitals [22]. AMCs now account for over 17% of all USA hospitals and health systems and dominate the best hospital rankings [23]. The USA has a mature AMC system with a number of structural models ranging from affiliated to fully integrated [24].

The two countries were chosen given their distinct differences in the relative maturity of the academic healthcare delivery system as well as in how medical doctors are commonly engaged. The study sites within the countries were similarly chosen for their contrasting maturity but also their similarity in adopting the fully integrated, university-led model of academic healthcare delivery. Further detail on healthcare delivery and doctor engagement in the countries is provided below and summarised in Table 1.

1.2.1 Doctor engagement and leadership in Australia's health system

The Australian healthcare system is complex, with funding and service delivery responsibilities shared by two levels of government and the private sector [25]. Whilst the Commonwealth funded Medicare system provides universal access to healthcare, the States are the main providers of health services, mainly through public hospitals [25]. Hospital services are provided by both the public and private sectors, with primary care provided predominantly by the private sector. Public hospitals are state owned and locally run. Private hospitals are owned and managed by private organisations (both for-profit and not-for-profit).

Most doctors in Australia are self-employed, contracting or 'accredited' with public and/or private hospitals to provide medical services. A relatively small proportion of doctors attract a salary by virtue of employment with the government. Salaries are governed by a state-based award, which is based on experience and seniority, to the exclusion of speciality-based earning potential [26]. Public hospital-employed doctors also have rights to treat a proportion of patients as private patients (with some financial benefit to both the hospital and individual doctor) through 'Rights of Private Practice'. In 2019-20, 12% of the employed public hospital

workforce in Australia were salaried doctors, whereas in 2016-17 (most recent data available) salaried medical officers accounted for only 2% of private hospital employed staff [27].

There is a documented shortage of qualified doctor managers and leaders - formally known as ‘medical administrators’ - in Australia due to an inability to attract, recruit, retain and train such individuals [28]. It has further been acknowledged that the medical profession in Australia has a generally poor understanding of and regard for the roles and skills required of medical leadership [29], which could potentially be improved through a greater offering and uptake of leadership training and development [30].



1.2.2 Physician engagement and leadership in the USA



The USA does not have a coordinated healthcare system. It has a mix of predominantly private and some public insurers and healthcare providers [31]. The federal government funds national healthcare for those over 65, people with disabilities, veterans and low-income residents whilst state governments manage some local coverage and a safety net [31]. Private insurance is the dominant funder, primarily financed by employers [31].

In 2020, it was estimated that 50.2% of physicians in the USA were hospital or health system employed [32]. This has been on an upward trend for at least ten years [32]. Overwhelmingly, physicians in AMCs are employed, often through a medical group owned by the health system or university, commonly referred to as a Faculty Practice Plan (FPP) [33]. Physician salaries or ‘compensation’ are determined by individual health systems or FPPs and are speciality- and volume-based, generally tied to relative value units [34]. Whilst some models enable protected time for scholarly activity, most financial incentives are geared towards the delivery of revenue from clinical care [13, 35].

As with Australia, there is a shortage of qualified physician executives in the USA [36]. Whilst medical leadership positions - particularly in academic medicine - have been formalised and recognised for a longer period, most physician leaders have acquired their positions through clinical distinction, rather than management or leadership skills [36].

Table 1: Comparison of the Australian and United States Health Care Systems in Relation to Medical Engagement and Leadership

	 Australia	 USA
Structure	Mix of public and private hospitals – public hospitals dominate.	Largely private hospitals – academic medical centres dominate.
Maturity of the Academic	Relatively immature – progress hampered by separate public	Mature and has been through several iterations – largely accepted as the gold standard.

	 Australia	 USA
Healthcare System as a construct	hospital and university bureaucracies.	
Doctor relationships and remuneration	Doctors are largely self-employed. When employed by a hospital or health system, it is overwhelmingly in the public sector, with remuneration governed by an award and not specialty based.	Most doctors are employed by hospitals/health systems or practice plans. Compensation is speciality based and often tied to clinical productivity.
Treatment of high acuity patients	Largely occurs in tertiary and quaternary public hospitals.	Largely occurs in academic medical centres.
Medical leadership	Underserviced and not highly sought after. Medical leadership training is scarce.	Underserviced with positions often filled by those with clinical experience and distinction rather than those with leadership and management skills. Leadership training is more common.

1.3 Study overview, research question and objectives

Having regard to the foregoing, this research set out to answer the question: *How does one measure active doctor engagement and what are the individual and organisational factors contributing to it in the context of academic healthcare delivery?* The primary objective of this study was, therefore, to develop and validate a tool to measure doctor activation as an active and defined form of doctor engagement. Additionally, the research aimed to:

1. Determine the individual or organisational predictors of doctor activation and what may detract from it.
2. Determine the individual or organisational predictors of tangible results arising from activated doctors.
3. Ascertain whether there is a correlation between doctor activation and tangible results being delivered for the organisation.
4. Conduct a cross country comparison between Australia and the USA with reference to their relatively immature and mature academic healthcare systems, respectively.

The study was conducted via a mixed methods process to both develop and validate the survey tool, as well as understand and compare doctor engagement and activation at two study sites. By design, it aimed to develop the tool and collect data that represented the potentially diverse perspectives of healthcare administrators and doctors working in the system.

1.4 Organisation of thesis

This thesis is organised into seven chapters: introduction, literature review, methods, qualitative results, survey validation, survey results, and discussion and conclusion. The purpose of, and methods utilised in each chapter are summarised in Table 2.

Table 2: Outline of thesis structure and methods utilised

Chapter	Research Question/Purpose	Methods
1. Introduction	Answering the research question of <i>how does one measure active doctor engagement and what are the individual and organisational factors contributing to it in the context of academic healthcare delivery</i> , the introduction aims to set the scene for the current state of doctor engagement and its measurement in the context of US and Australian Healthcare delivery.	
2. Narrative Literature Review	Understand the literature on clinician/physician engagement and attempts to measure it.	Confined literature search, quality assessment and general inductive analysis and synthesis of results.
3. Qualitative Methods	<ul style="list-style-type: none"> Determine the individual or organisational predictors of doctor activation and what may detract from it. Conduct a cross country comparison between Australia and the USA with reference to their relatively immature and mature academic healthcare systems, respectively. Contribute to face and content validity analyses for the survey tool. 	Semi-structured interviews.
4. Qualitative Leadership Interview Results		Thematic analysis utilising a largely deductive approach.
5. Quantitative Methods	<ul style="list-style-type: none"> Develop and validate a tool to measure doctor activation as an active and defined form of doctor engagement. Determine the individual or organisational predictors of doctor activation and what may detract from it. Determine the individual or organisational predictors of tangible results arising from activated doctors. Ascertain whether there is a correlation between doctor activation and tangible results being delivered for the organisation. 	Co-design, administration, validation, and analysis of results of MD-A survey.
6. Doctor Activation Survey Development and Validation		Survey design and validation utilising: <ul style="list-style-type: none"> Literature review Co-design of preliminary scale Face and content validity Survey testing Survey administration

Chapter	Research Question/Purpose	Methods
	<ul style="list-style-type: none"> Conduct a cross country comparison between Australia and the USA with reference to their relatively immature and mature academic healthcare systems, respectively. 	<ul style="list-style-type: none"> Validity (exploratory and confirmatory factor analyses) and reliability (Cronbach's Alpha) assessment of the survey Survey tool refinement
7. Doctor Activation Survey Results		Statistical analysis of survey and thematic analysis of open-ended question responses.
8. Discussion and Conclusion	Summary of findings; research contribution; study challenges and lessons; future research; translation; and conclusion	Planned result reports and presentations to Executives/Doctor Leadership at each site.

1.5 Ethics

Ethics approval for this study was obtained from the Macquarie University Human Research Ethics Committee (Ref: 520211031828797). Site specific governance approvals (Clinical Research Governance Review and Institutional Review Board respectively) were also obtained from the two study sites.

CHAPTER 2: NARRATIVE LITERATURE REVIEW

2.1 Overview of Chapter 2

This chapter provides a narrative review of the literature on medical doctor engagement in support of the research question, *“how does one measure medical doctor engagement and activation and what are the individual and organisational factors contributing to it in the context of healthcare delivery?”*. In doing so the literature is summarised under the thematic areas of: defining doctor engagement and activation, benefits and imperatives for engagement, facilitators of engagement, the relationship between engagement and burnout, and measuring engagement and activation.

2.2 Introduction

Doctor engagement is considered pivotal in health system transformation and the recent shift in focus to delivering value-based healthcare [7, 37-43]. This, along with its demonstrated role in delivering better quality care and outcomes for patients and better overall organisational performance [5-12], make doctor engagement an area of focus for many healthcare organisations. Despite this attention and importance, sound understanding of the concept and ability to effectively measure and link it to outcomes remains limited [2, 10, 12, 44, 45]. This is a significant gap in system knowledge and ability, given the large investment many healthcare organisations make in engagement initiatives. Similarly, from the perspective of the doctor, the lack of clarity on how to ‘engage’ at the organisational level and lack of encouragement and incentive to lead transformation, may be a missed opportunity in health system advancement [4]. Doctor engagement at the organisational level describes the regular, positive, and active contribution of medical doctors to sustaining or improving the performance of their workplace [1-3].

2.3 Method

This literature review involved a circumscribed PubMed analysis under two separate key phrase searches of “clinician engagement” and “physician engagement” (capturing different terms for medical officers in Australia and the USA respectively). The search terms were chosen with a view to capturing Australian and United States literature, given the location of the study sites. The search was also limited, for pragmatic reasons, to studies published during the 12 years between 2009 and 2021. The results of the search were exported into Endnote, with the combined search yielding 390 unique results. Study selection and screening was completed in two stages, with screening based on the inclusion criteria, namely peer-reviewed empirical studies with a focus on doctor engagement. Initially, titles and abstracts were reviewed for relevance with 248 excluded predominantly because of a lack of relevance to the research question, or articles being opinion or review articles. The remaining 142 studies were

further screened by accessing and reviewing the full text articles with a further 45 studies excluded based on relevance. The final 97 studies were included in the review. Of these, 44% were from the USA, 12% from Australia, 31% from Canada and the remaining 13% from other countries. The main areas of focus of the literature included strategies/facilitators and barriers to engagement (57%); outcomes of engagement (23%), and measurement of engagement (5%). The relationship between engagement and burnout was also explored in a subsequent search of “physician”, “burnout”, “engagement” and “academic healthcare” in various combinations, with a further ten relevant studies included in the review. This relationship was explored given speculation in some of the included literature, of the link between engagement and burnout.

2.4 Defining doctor engagement and activation

Speaking broadly, ‘engagement’ in healthcare has been defined as a positive, fulfilling state of mind in relation to work, which is exemplified by vigour, dedication and absorption [10]. Clinician engagement (also referred to as ‘physician engagement’ in North America and ‘medical engagement’ in Europe), is a term used broadly in the literature to refer to engagement at any of the patient, project, organisation or system levels [2]. It may include: the level of association a doctor feels towards a healthcare organisation, active attendance at meetings and fulfillment of assigned role, loyalty, active support for a project, implementation of best practice, being accountable for and appropriately utilising organisational resources, effective leadership (including in strategy, decision making, financial management, quality and safety and management of departments or clinical areas), and/or participation in teaching and research [2, 10].

In pinpointing an appropriate definition for the purposes of measuring doctor engagement at the organisational level, the term has been used to describe the regular, positive and active contribution of medical doctors to sustaining or improving the performance of their workplace [1-3]. The definition provided for the English National Health Service’s (NHS’s) Medical Engagement Scale (MES), takes this further in suggesting that the organisation itself must also recognise the contribution of doctors in facilitating high quality care [46]. Other definitions support concepts of ownership of optimal healthcare delivery by doctors and purposeful commitment to delivery of organisational objectives [12].

In recognition of the role that organisations can and desire to play in fostering doctor engagement, understanding and measuring doctor ‘activation’ has been proposed as a novel and potentially useful and well defined concept [4]. As analogous to patient activation, which has been proven to positively correlate with a patient’s healthcare outcomes and appropriate healthcare utilisation on an enduring basis [16], doctor activation has been proposed as a measure linked to the delivery of high value care [4]. As distinct from engagement, activation in the context of the patient has been defined as the willingness, knowledge and ability to take

autonomous action in managing one's health and healthcare [47]. In this context, measuring doctor activation has the potential to predict and identify doctors who are well prepared and equipped to partner with their organisations and health systems to deliver positive changes and outcomes, whilst also identifying those that may need support or intervention to increase activation. Considering the literature, co-design process and interviews and for the purposes of this research, doctor activation, as a novel concept, has therefore been defined as: *The ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient-centred care.*

2.5 Benefits of and System Level Imperatives for Doctor Engagement

Despite being a relatively nebulous set of constructs, doctor engagement has been documented as linking to many and varied benefits at the patient and organisational levels of healthcare delivery. At the patient level, benefits of high levels of doctor engagement include: better performance on patient desired outcomes [5], better patient experience [48], and greater safety in patient care [1]. At the organisational level benefits include: the delivery of better quality care and clinical outcomes [1, 5, 6, 8, 10, 49-51], development of successful quality improvement, information technology (IT), redesign and physical design initiatives [52-56], cost reduction and efficiency [8, 10, 51, 57], enhanced doctor wellbeing, productivity and retention [10, 58], and better overall performance [8, 58]. At the highest level of engagement, the proactive involvement of doctors in leadership and strategic decision making is positively correlated with hospital performance [59]. Conversely, where doctor engagement in quality initiatives proves difficult to achieve - such as in healthcare associated infection reduction efforts - hospitals struggle to gain traction and improve [60].

More recently, because of significant external pressures, healthcare systems looking to transform the delivery of care have shifted their focus away from increasing volumes to delivering value - excellent, patient-outcomes focused, efficient, financially sustainable healthcare services [19]. As in many industries, this shift aligns with the move to consumer determined value as a unifying objective [19]. The delivery of high value care and health system transformation is not deemed possible without doctor engagement and leadership [7, 37-43], making it an important area of focus for organisations, and one they may be likely to want to measure.

2.6 Facilitators of doctor engagement

Individual Factors

As distinct from the cultures of most other professions (including allied health, nursing and administration), doctors tend to be highly individual in their motivations and professional identities, with little natural affiliation towards their organisation or health system [61-63]. This seems particularly true of those in private practice who tend to view hospital and system

leaders as peripheral and bureaucratic [62]. As such, engaging effectively with doctors requires an understanding of doctor identity and individual motivations, building trust and respect, and ensuring professional cultural alignment [64-66]. Additionally, misalignment in the form of work overload and an incongruence in personal professional and organisational values are correlated with disengagement and burnout [67].

At an individual level, it has been documented that experiencing professional fulfilment and meaning from organisational or healthcare system development work is important in ensuring ongoing doctor engagement in such endeavours [68, 69]. Similarly, clinical teams have been shown to more willingly engage with activities that align with their long-term goals [70]. Where such alignment occurs, impact of initiatives is likely to be more profound [70].

Key Role and Leadership Positions

When executed well – with role clarity and adequate training and support – the engagement of doctors in key roles and leadership positions has been shown to improve individual performance as well as broader doctor engagement [71, 72]. A recent trend in the USA in this area has been the creation of medical staff quality officer positions. Such positions play a significant role in designing and driving quality improvement efforts, providing mentorship and role modelling within clinical departments, and have been reported to be effective in improving clinical and organisational outcomes [73-75].

In fostering performance and sustainable engagement it is said to be important for organisations to provide formal recognition for the role of doctor leaders [76]. Such recognition may include remuneration and incentives, access to tailored learning and development opportunities, recognition programs and the development of meaningful roles for doctors within the organisation [76].

Organisational Support and Resources

Given the busy nature of clinical work, coupled with research and teaching endeavours of academic doctors, organisational support is reportedly crucial to broader engagement [76, 77]. To encourage the engagement of doctors in organisational and system improvement initiatives the following have been documented as useful: a well-developed engagement infrastructure and strategy including doctor compacts (social agreements between the organisation and its doctors in relation to mutual expectations) [12, 68], high quality practice, project and administrative support [41, 78, 79], networking and mentoring strategies including summits and forums [76, 80], streamlining bureaucratic processes and implementing time-saving interventions [76, 81], providing committee and positional role clarity and purpose [68, 76], improving usability of technology [82], standardising compensation and providing financial recognition [41, 78], effective communication, access for frontline doctors to leadership and information exchange [41, 83], interprofessional, peer and inter-specialty collaboration [79,

84, 85] and providing resources to promote resilience and self-care [86]. Additionally, to promote value-based care, any incentives provided to doctors should ensure rewards are based on quality metrics, shifting the focus from volume to value [12, 87].

In the specific example of eliciting the required doctor engagement in a successful electronic medical record (eMR) rollout, a number of the abovementioned strategies were successfully deployed [88]. Such engagement strategies, which are recommended for other eMR rollouts include: an adequately staffed and skilled training team, a clinical champion to communicate and engage doctors in the change from the outset, thoughtful training design tailored to the audience, accessible training times and locations, and recognition for participation in training [88].

Training and Peer Support

Purpose designed, relevant training programs have been shown to promote doctor engagement [76, 89, 90]. The format, setting and content of such programs should be tailored to individual circumstances, but may focus on leadership skills and development and knowledge that facilitate engagement and activation, and prevent burnout [89, 90].

Peer to peer consultation and networking have also been shown to promote doctor engagement [72, 91, 92]. Specific successful examples of this strategy in practice include medical safety huddles for engagement in quality improvement at the organisational level [91] and networking to promote professional development of doctors in patient safety and quality [72].

Structure and Governance

In considering an appropriate structure to promote optimal clinical engagement in an organisation, several models and initiatives have proven effective. From a structural standpoint, divisional structures, clinical networks and clinical senates have been shown to promote doctor engagement at the organisational and system levels [51, 93, 94]. Such models can facilitate engagement through communication, identification and pursuit of common and collaborative interests, trust building, a common voice for doctors and an effective way to approach difficult problems [93, 94]. These types of vehicles, bolstered by other organisational meetings involving doctors, can be beneficially viewed as valuable engagement opportunities where organisations thereby aim to ensure a clear pathway for the doctor voice to be heard [95]. In terms of decision making, rapid-cycle and bottom-up approaches are reported to be effective ways of engaging doctors in important changes and initiatives [96, 97].

Data and Metrics

It is well documented that doctors respond well to data and evidence based information sources [77] as well as peer competition [98]. As such, a number of successful engagement efforts employ the use of transparent data sharing in the form of any or all of, patient feedback

[98], best practice [98] and performance metrics [99]. Similarly, objective, simple, and data driven performance feedback can be an important mechanism in promoting the ongoing engagement and development of doctors [100].

Engagement in Research

There is a significant body of literature specifically concerning strategies to engage medical doctors in research. As distinct from broader engagement, there are clear motivations for doctor engagement in research being: contributing to clinical evidence and fulfilling intellectual curiosity, as well as providing value to patients [101, 102]. It has been noted however, that engagement in research does not routinely correlate with interest. Lack of time, support, infrastructure, financial compensation, training and knowledge of how to get started are cited as the biggest barriers to engaging in clinical research [101-103]. As such, documented strategies to engage doctors in research include: appointing clinical research champions [103, 104], ensuring a research/innovation values fit with doctors and creating research friendly clinical cultures [104, 105], utilising data collection tools, technology and support staff to minimise the administrative burden on doctors [103, 105-107], greater funding and incentives for clinical trials [106], providing resources and protected time for research [107], improved education and training and mentorship as well as practical experiences for new doctor researchers [107, 108].

The literature reveals a significant array of facilitators of doctor engagement as outlined above. Such facilitators have been gleaned from specific studies using non-specific engagement measurement tools, study specific surveys, interviews or anecdotal evidence. The void of a recognised measurement tool specific for doctor engagement in the majority of these studies draws into question the reliability and replicability of the findings across contexts and supports the case for such an instrument to be developed. Nonetheless, the engagement strategies outlined above provide clues for the present study in hypothesising the individual and organisational predictors of doctor activation as one of the objectives of this research.

2.7 Engagement and burnout

Burnout is a significant issue in the healthcare industry, particularly for doctors [109], with over 50% [86] and up to 80% [110] of doctors in the United States reported to experience some level or element of professional burnout. This number is likely to be significantly exacerbated in the current context as a result of the COVID-19 pandemic [109]. Burnout has been defined as a primarily workplace driven syndrome, characterised by three core elements (or subscales) of, exhaustion, a reduced sense of personal accomplishment, and depersonalisation [86, 111].

There is speculation that engagement and burnout are inversely correlated [86, 112], but this does not appear to have been satisfactorily (or convincingly) demonstrated in the healthcare setting. Other studies have shown that burnout can be present alongside engagement and

absent in those who are disengaged [113, 114]. In a comprehensive study conducted in the construction industry it was found that some elements of burnout (cynicism/disengagement) - as measured by the Maslach Burnout Inventory - are inversely correlated with one element of work engagement (dedication) as measured by the Utrecht Work Engagement Scale [115]. An inverse relationship between 'grit' and burnout has also been demonstrated in a study of orthopaedic surgeons in the United States [116]. In another clinical study, of Healthcare Maintenance Organisations, doctor burnout was correlated with the organisational factors of Workload/Scheduling and Input/Influence [117]. A further study demonstrated that doctors with high trust in their organisation were less likely to experience stress [118]. So, whilst some indirect or partial correlations can be made, the direct relationship between doctor engagement (or disengagement) and burnout, remains elusive.

2.8 Measuring doctor engagement

The measurement of doctor engagement is currently challenged by low doctor participation [119-122] and identifying a tool that ensures specificity/reliability for a unique professional group [12, 44, 45, 123]. Due to lack of time; competing priorities; lack of perceived value in or understanding of objectives; and apprehensions about the confidentiality of results, medical professional response rates to surveys are often inadequately low [119-122]. Additionally, in a survey of 10 high-performing hospitals in the USA, none were able to identify or had used what they considered to be a reliable tool to measure doctor engagement [12]. This is largely given the lack of translatability of traditional employee engagement tools from other sectors to doctors [123].

In a comprehensive scoping review of hospital physician engagement, it was found that the 9 item Utrecht Work Engagement Scale (UWES) was the overwhelmingly dominant tool utilised when measuring doctor engagement [10]. This scale's popularity is likely due to its brevity. Unfortunately however, this measurement tool is not fit for purpose for medical professionals; it has an inability to link engagement with organisational outcomes; and it does not work effectively in the Australian context, where the majority of medical professionals are not employees of hospitals or health services [10]. Additionally, as with other traditional broad measures of employee engagement, the UWES measures engagement based on the individual employee alone. In terms of doctor engagement however, it is clear that organisational systems and culture play a pivotal role in encouraging or detracting from doctors' propensity to engage with their organisation [124].

In this review of the literature, two tools specifically designed to measure doctor engagement were uncovered, but neither appeared to have been widely applied beyond the context for which they were specifically designed. The first is a purpose designed tool to measure doctor engagement in addressing healthcare disparities [125]. This nine-item survey was derived

from the AREA (awareness, reflection, empowerment and action) model and was shown by the authors to be valid and reliable for its specific purpose [125]. The second tool is the 18 or 30 item Medical Engagement Scale (MES) designed for the UK NHS Enhancing Engagement in Medical Leadership project [124]. Whilst this survey tool uniquely recognises that a doctor engagement scale should assess both individual engagement and engagement within the organisational context [124], it is designed for doctors who are employees of hospitals, which, as indicated, is not routinely the case in countries such as Australia. Nonetheless the tool was shown to be valid and reliable in its specific purpose and context. Both tools importantly recognised the value of a short yet fit-for-purpose tool for measuring doctor engagement [124, 125].

In recognition of the deficit of a purpose designed, broadly and globally applicable tool that measures not only engagement, but the ability of doctors in leading and participating in organisational and system improvement, Gray et al have proposed the creation of a ‘physician activation measure’ [4]. Given the importance of the engagement and leadership of doctors in health system transformation, creating, and validating such a measurement tool is the chosen subject of this research.

2.9 Conclusion

Whilst the literature on doctor engagement is significant at face value, it remains a nebulous concept and there is a void of evidence and corresponding instruments that allow for its appropriate, reliable, and ongoing measurement in the context of health system advancement. This is a significant gap given the large investment of health systems in engagement initiatives and an inability to measure their success. Doctor activation and its associated measurement are proposed as a solution to address this gap and allow for common understanding. Clues as to relevant domains, attributes, associations and likely detractors and predictors have been gleaned from this review of the literature. Based on the review and the concepts and research examined, we can now turn to original research planned in the thesis.

CHAPTER 3: METHODS

3.1 Overview of Chapter 3

This chapter outlines the convergent mixed-methods design deployed in the study to: gain a deep understanding of doctor engagement and activation at two study sites; conceptualise, develop, and validate a tool to measure doctor activation; and analyse and compare the results of the survey following administration. An overview of the design and methods utilised are provided below (Figure 1). The chapter is organised into four sections: section 3.2 introduces the study setting and participants, section 3.3 outlines the methods, recruitment, procedure, and data analysis for the qualitative component of the research, 3.4 reports on the processes undertaken to develop, administer and validate the survey, as well as an overview on how the survey data were analysed, and 3.5 provides a summary of the chapter and the methods utilised in this study.

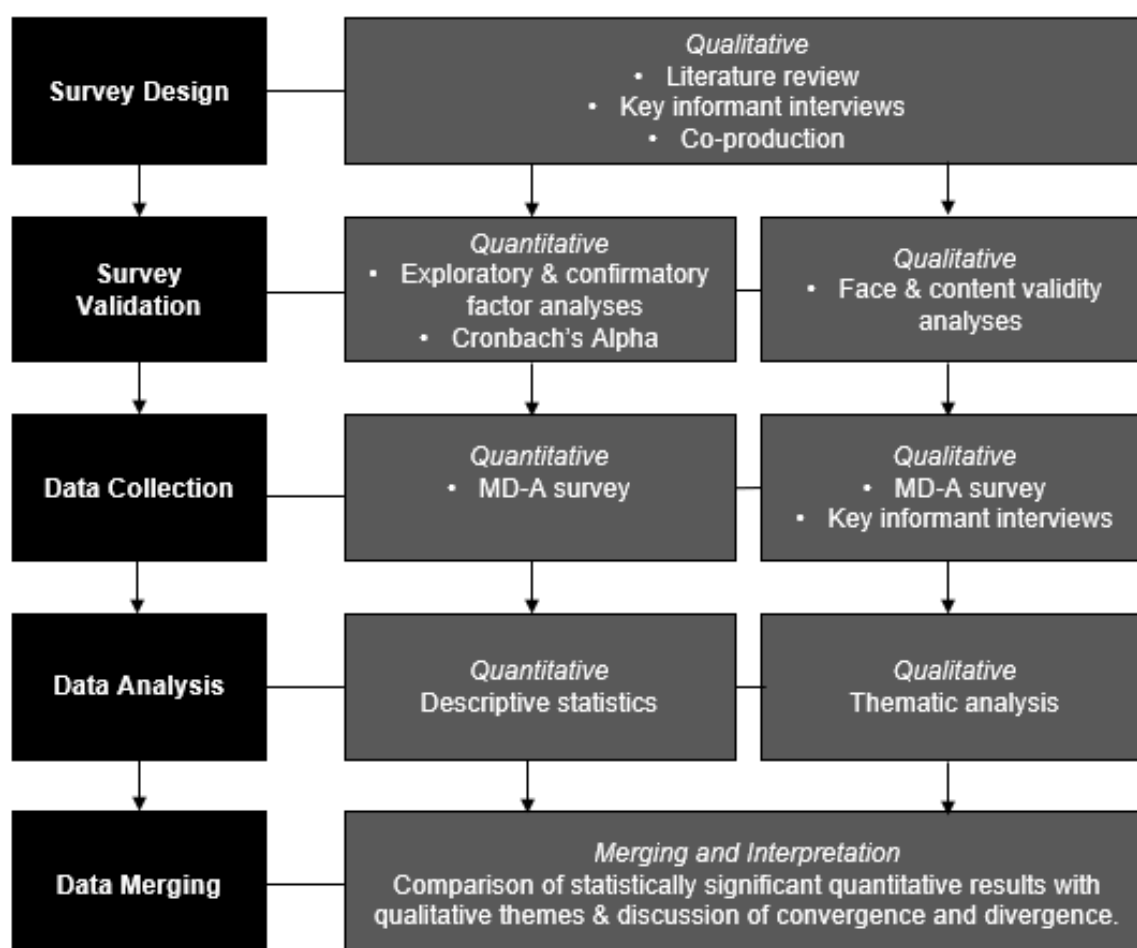


Figure 1: Convergent mixed methods study design

3.2 Study setting and participants

The study occurred across two not-for-profit academic health centres, one in New South Wales, Australia and one in Florida, USA. Both sites share a common tripartite mission to

deliver excellence in clinical care, education, and research. On the surface, both sites also recognise the criticality of doctor engagement in delivering upon their missions. The Australian site comprises a single hospital, whilst the USA site comprises ten hospitals across the state, with just over double the number of affiliated doctors eligible for participation in the study. Of contrasting note is the maturity of the two systems with the oldest hospital of the USA site being established over 150 years ago and the hospital of the Australian site being just 11 years old. An overview of the structure and engagement of doctors at the two sites is provided in Table 3.

Table 3: Comparison of Australian and USA study sites

	Australian site	USA site
Structure	Academic Health Sciences Centre (University led), not-for-profit, private.	Academic Medical Centre (University led), not-for-profit, private.
Number of Hospitals and Outpatient Clinics	1 hospital, 23 primary care and specialty clinics	10 hospitals, 47 distinct primary care and specialty clinics delivered at multiple locations
Number of doctors	~700	~1500
Engagement of doctors	Largely ‘accredited practitioners’. Some more formal ‘engagement arrangements’ in place with approximately 25% of doctors including employed, revenue share license agreements and group practice agreements.	Predominantly employed within the FPP/physician organisation.

Study participants for the qualitative component of the study included key members of each organisation’s executive leadership team. The focus was on selecting those likely to be able to provide deep insight into the engagement of doctors at their respective organisations, during a semi-structured interview. The participants in the quantitative research component included the entirety of the medical professional body (fellow level and above) actively affiliated with the study sites for the survey. Excluded from the study were medical professionals who were not actively affiliated with the study sites; non-medical clinicians (such as nurses and allied health practitioners); physician extenders; and junior doctors (below Fellow training level) due to their transient, rotational nature, and relative inexperience.

3.3 Qualitative research – semi-structured interviews

3.3.1 Methods, recruitment, and sampling

The qualitative method chosen for this component of the study was semi-structured key informant interviews with senior executives at each study site. The aims were to gain an in-depth understanding of doctor engagement perspectives and associated structures at the sites,

contribute to face and content validity analyses for the tool, and gain insights into potential predictors and detractors of doctor activation. Understanding the potential disadvantages in terms of reliability and bias [126], the semi structured interview format was selected to account for the cross-cultural nature of the two sites in this study and allow the interviewer the flexibility to probe for context [127], and for the interviewee to understand jargon and cultural nuances.

Recruitment for the semi-structured interviews involved purposive sampling to identify key informants likely to deliver information-rich results. This sampling method was chosen to enable the delivery of detailed results in an efficient manner [128, 129] given the limited resources and hence scope of the project. The criteria for selection of participants were: senior leadership in a medical or administrative role; and involvement in developing or delivering doctor engagement structures and strategies. A mix of medical and non-medical senior executive representation was sought to explore these different perspectives. Three leaders who were available to participate in an interview in the allocated period were selected from the Australian site and four from the US site. An overview of the participants and their roles is outlined in Table 4.

Table 4: Interview participants

US site participants	Australian site participants
Hospital Chief Executive Officer (non-physician)	Hospital Chief Executive Officer (non-clinician)
Head of Physician Group (Physician in dedicated physician leadership role)	Head of Clinician Group (Clinician in designated clinician leadership role)
Head of Faculty Affairs and Professional Development (Physician in dedicated physician leadership role)	Executive Dean/Head of Academic Health System (clinician)
Senior Director Leadership Training and Organisational Development (non-physician)	

3.3.2 Procedure

Once written consent to participate had been obtained, individual interviews were scheduled at convenient times for each of the interviewees. Interviews were conducted on a one-on-one basis via Zoom online conferencing and were audio-recorded and auto transcribed with participants' consent. I was known to the interviewees at the Australian site, allowing free flowing discussion and deep exploration of concepts. I additionally brought knowledge of academic healthcare workings in Australia and the USA from experience and prior study to

the interviews. The interviews followed a schedule of open questions (developed based on the literature review and research questions), that allowed for interviews to be guided but dynamic, with the ability to adapt in response to areas of focus or interest brought up by the interviewee. The schedule was slightly adapted to ensure relevant terminology within the cultural contexts of the two study sites (Appendix A).

Interview participants were initially asked to introduce themselves including their professional background and what had led them to work at their current organisation. This opening question aimed to break the ice with the interviewee. The interviews then followed a structure of questions aimed at both aiding the development of, and providing face and content validity for the tool, as well as understanding the context and structure of doctor engagement at each site. The questions aimed at survey development and validation included: defining doctor engagement and its elements and reviewing proposed domains, outlining predictors and detractors of activation, and reviewing the draft survey. The questions aimed at understanding site-specific doctor activation included: describing the level of doctor engagement at the organisation and whether it has ever been measured, providing illustrative examples of engagement and disengagement within the organisation, describing initiatives to improve engagement, overviewing existing structures for engagement, describing communication with doctors and the relationship between senior doctors and senior administration, exploring incentives and engagement arrangements, and understanding where engagement is most valued and easier to achieve within the organisation.

Questions were adapted to suit individuals, particularly where the question was not relevant to their role. In these cases, questions were altered to direct towards the participants area of expertise. Following the interviews, transcripts were automatically produced, deidentified and edited as necessary. They were then sent to the participant for review and confirmation. Participant checking is an important factor in quality research [130].

3.3.3 Data analysis

Following transcription, editing, and confirmation of transcripts, interview data analysis was conducted using the NVivo 20 software package and supported by a thematic analysis approach. Thematic analysis was selected for its relevant benefits in flexibility, allowing examination of different perspectives, and ability to allow for comparison (similarities and differences) within and between the two study sites [131, 132]. The six steps associated with thematic analysis were followed including: familiarisation with the data, generating initial codes, identifying themes, reviewing themes, defining themes, and results reporting [131, 132].

Data familiarisation was achieved through participation in all interviews as the interviewer, listening to audio recordings, editing auto-generated transcripts individually, and re-reading transcripts collectively as a full data set. Initial coding was then undertaken as the second stage

in the thematic analysis process. The following 14 codes were generated with relevant data assigned: USA context, Australian context, USA site overview, Australian site overview, doctor engagement, doctor disengagement, communication, doctor/administrator relationships, predictors of activation, detractors of activation, measurement of engagement, incentives, organisational areas of doctor engagement, and strategies to improve engagement. Initial codes were cross checked and confirmed by two independent members of the study supervisory team.

The next phase of the analysis focused on identifying, reviewing, and defining themes. Identification of themes followed a largely deductive approach with expected themes based on the literature review and interview questions. Five broad overarching themes were confirmed as: context and study site overviews, doctor engagement and disengagement, predictors and detractors of activation, communication and relationships and incentives and strategies to improve engagement and activation. Several cross-sectional themes were also identified being structure, leadership, communication, and incentives. Results were then reported in accordance with identified themes.

3.4 Development, validation, and analysis of survey

3.4.1 Development of survey

Having collected qualitative data from the interviews we then turned to the development of the Measure of Doctor Activation (MD-A) which occurred in four stages (Figure 2). The first involved utilising the literature to determine preliminary domains and subdomains, the second involved co-production to form a preliminary tool, and the third involved trial and feedback to conduct face and content validity analyses. The final stage involved testing for validity and reliability and refining the tool.

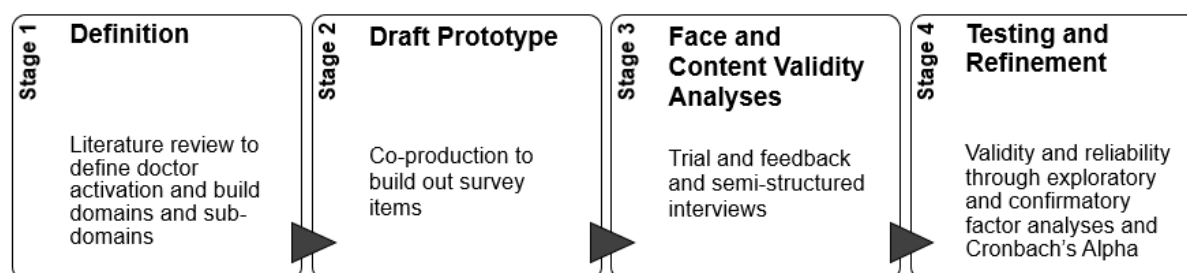


Figure 2: Stages of MD-A Development

The MD-A was initially conceptualised and constructed based on an extensive review of the literature related to doctor engagement. In doing so, it also drew on the principles of the Patient Activation Measure (PAM) (a widely utilised, reliable, and valid tool in assessing a patient's knowledge, skills, and confidence in managing their own health [14, 15, 133]). Based on this review and principles, initial domains and potential subdomains were constructed.

The second stage of development of the MD-A involved the co-production (with doctors and healthcare administrative leaders) of a purpose-designed tool to measure ‘doctor activation’. Co-production, as a form of participatory research, involves collaboration between researchers and practitioners (or intended users or beneficiaries) in the development and conduct of research [134, 135]. In the context of this research, co-production of the survey tool with doctors and healthcare administrators who have identified the problem that is being addressed, was undertaken to increase relevance and likelihood of uptake in the industry once validated [134-138].

The MD-A was conceptualised based on a published framework of ‘physician activation’ [4] and items were initially co-designed with two of the authors of that paper (CF Gray and H Parvataneni). Both Gray and Parvataneni are practicing academic physicians in leadership roles in the USA health system, other members of the research team are esteemed researchers with deep experience in health system delivery from the Australian Institute of Health Innovation, and I am employed at the executive level in the Australian health system. A co-development approach to producing the survey tool was selected to render it more relevant across different cultural contexts, whilst also considering the perspectives of both doctors and healthcare administrators in the design, function, and potential uses of the tool. An initial pool of survey items mapped to the domains determined above was developed by the research team based on the literature, existing scales, and research team expertise. The draft prototype was then developed utilising the Qualtrics platform.

Face and content validity analyses were completed by circulating the prototype tool to a purposive sample of 27 medical doctors from Australia (14) and the USA (13) from a variety of hospitals and health systems who agreed to pilot and provide feedback on the tool. These doctors were known to various members of the research team and were external to the study sites. The doctors were asked to complete the online version of the tool and provide written feedback in relation to ease of understanding, ease of navigation and completion, relevance to the definition of activation provided, and whether anything fundamental was missing. The survey was also circulated to participants in the semi-structured interviews to glean their feedback. The face and content validity process focused on ensuring that respondents understood the same concepts of the survey in the same way regardless of their cultural context. Resultant edits to the survey were made in the Qualtrics platform and an electronic survey was produced for each study site with appropriate personalisation and branding.

3.4.2 Survey administration procedure

An email with an embedded link to the MD-A was distributed to all doctors at the postgraduate fellow level and above at the two health systems respectively. The survey was administered via Qualtrics and sent to participants by an Executive representative at each site. The survey was

anonymous to preserve confidentiality, increase response rates and encourage faithful responses to potentially sensitive questions [139]. The survey remained active for a four-week period during December 2021 - January 2022 at the Australian site and January – February 2022 at the USA site. Two reminder emails were sent to eligible participants at each site in the intervening periods.

3.4.3 Validation of survey

Once the collection periods ended, the surveys were closed, and results were downloaded from the Qualtrics platform to SPSS version 28 for analysis. The resulting data were used to refine and consolidate the instrument to produce a survey that had strong psychometric qualities whilst also being short enough to be completed by busy doctors.

An exploratory factor analysis was performed on the draft instrument in SPSS to determine the number of underlying factors and to undertake any necessary initial item reduction. The survey was then validated using AMOS version 28 to conduct a confirmatory factor analysis (CFA) to assess the psychometric dimensional validity of the survey. As CFA is a useful tool in correlating survey items with the dimensions of a construct [140], it was utilised to test the correlation of the hypothesised elements of doctor engagement deduced from the available literature with corresponding survey items, as well as ensuring survey interpretation across the two countries was consistent. As part of this process several survey items were removed to improve the model fit and reduce the survey size.

Reliability of the survey tool was assessed utilising Cronbach's alpha. Widely applied cut-offs of alpha values were applied in this study, with those above 0.70 considered satisfactory and above 0.80 excellent [141].

3.4.4 Survey data analysis

The study targeted a sample size based on a commonly accepted minimum sample for confirmatory factor analysis of 100 participants [142] - 50 from each study site. Respondent data with a missing rate greater than 15% were excluded from the analyses. Any remaining missing values were assigned by applying the Expectation Maximisation Algorithm within SPSS version 28.

Descriptive statistics were then applied to understand correlations and significance in answering the research questions. Initially, cut scores were applied to correspond with the four-level scale of activation conceptualised in Chapter 5. Significance was then determined between the two study sites across each domain and overall. To understand correlations, one-way ANOVA analyses were utilised to explore the relationship between higher activation scores and potential predictors of activation. Those who were highly activated and delivering tangible results for their organisation were statistically analysed in comparison to the rest of

the respondents using a logistic regression. Finally, qualitative survey data from the open-ended question at the end of the survey were analysed using a thematic analysis approach.

3.5 Summary of chapter 3

This chapter outlined the mixed qualitative methods utilised to gain expert input into the development of the survey tool and understand doctor engagement context, structures, and incentives at each of the study sites from the perspectives of organisational leadership. In addition, it outlined the mixed qualitative and quantitative methods utilised to develop, validate, and analyse the survey and its results.

CHAPTER 4: QUALITATIVE LEADERSHIP INTERVIEW RESULTS

4.1 Overview of Chapter 4

Chapter 4 details the results of the semi-structured interviews conducted with a small purposive sample of executive leaders at the two study sites. First, an overview and context for doctor engagement and activation at each of the study sites is provided, as gleaned from the interviewees. Second, the elements of doctor engagement and disengagement are defined from the perspectives of interview participants. Third, the interviewees' predictions in terms of the characteristics of activated and deactivated doctors are summarised. Fourth, the themes of communication and relationships are explored in relation to doctor activation at the two sites. Fifth, the potential utility of a tool such as the MD-A is explored. Finally, the interview participants' views on current and proposed strategies to promote doctor engagement and activation are discussed.

4.2 Context and study site overviews

4.2.1 Australian site overview

Organisational context for the study

Interviewees at the Australian site described the context, rationale, and challenges of attempting to create an academic health sciences centre (AHSC) within the Australian healthcare system. A system where separate public and private healthcare delivery is entrenched, and where formal mechanisms to engage doctors are not fit for purpose in achieving the tripartite (clinical care, teaching, and research) mission. One of the main rationales for creating such a model was cited as attempting to engage doctors *"in a deeper way than they are in other hospitals in Australia"*. Engagement of doctors in academic medical centres in the USA was cited as an exemplar of *"successful financial engagement that's different from solo practice that occurs in Australia"*.

The conflicts of attempting to deliver academic medicine in Australia's private healthcare sector were clear from the perspective of both clinician and executive leadership interviewees. As observed by one interviewee, tension exists between achieving the core goals of academic medicine and *"the environment in which we operate, which is highly private, individually driven and rewarded"*, with these operating conditions being *"...the trump card in terms of people's behaviour."* And another from the perspective of the organisation, *"traditionally the organisation has been very reliant on a private hospital type business model, firstly, and you can argue that's how we've been funded, both in the clinics and in the hospital."* Thus, similar tensions are observed at the individual and organisational levels, further exacerbated by the fully integrated AHSC model in Australia remaining uncommon and relatively embryonic [21].

Traditionally in private hospitals in Australia, it was noted that ‘clinical leadership’ is predominantly undertaken by nurses given they are employed, and doctors are traditionally not [143]. In public hospitals however, it was purported that more successful models had doctors involved in the leadership structure. It was also suggested that implementation of innovative, evidence based, integrated models of care, clinical translational research, and the teaching and training of medical students and junior doctors was largely undertaken by the public health system. In attempting to bring these elements of the public system to the private in the delivery of an AHSC, the Australian site has created a programmatic clinical leadership structure with eight Clinical Program Heads and 36 Clinical Discipline Heads (medical leadership positions), (Figure 3). These medical leaders were described as having roles and responsibilities spanning clinical care, teaching and research within their Clinical Program or Discipline. Clinical Program Heads have responsibility for a grouping of clinical disciplines (or specialties) designed to be collectively centred around the needs of the patient, and accordingly operate in an integrated fashion. For example, the Clinical Program Head of Cardiovascular and Respiratory has leadership responsibilities over the specialties of Cardiology, Respiratory Medicine, Cardiothoracic Surgery, and Vascular Surgery. The program (or centre) structure is a contemporary way of structuring clinical and academic services in an AHSC with a view to providing more connected, comprehensive, and value-based care to patients [144].

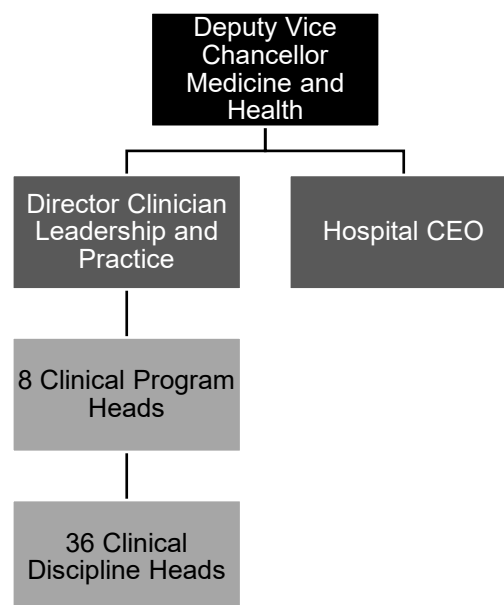


Figure 3: Clinical leadership structure at Australian site

Source: Author’s conceptualisation

This structure - being unique in the Australian private healthcare system - is seen as pivotal to the success of the Australian site as an AHSC, and more generally, exemplified by one interviewee as follows:

The biggest thing is going to be the Discipline and Program structure. If we can get Disciplines to be well organised and if the Discipline as a whole is engaged, then that

will be the thing that encourages engagement more broadly.... Particularly if there is some way of rewarding, recognising, or demonstrating value to Disciplines that can demonstrate cohesive contribution ... I mean the structure is there, but it just needs more contribution from the Discipline Heads in many cases, to make it happen.

Finding the right (financial and non-financial) incentives to encourage clinical engagement and leadership is also seen as an important challenge at the Australian site. Maintaining the attraction to the private system for many doctors being “*efficiency and agility*”, as well as better individual financial returns, whilst also encouraging deep academic and clinical engagement, is not observed to be an easy task. To the contrary, these drivers appear to be at odds in many individuals, as expressed by one interviewee: *I was a bit naïve... I thought everyone would flock to that idea [of a private academic health system] and just convert overnight, but I realised that change doesn't happen like that.*” In few cases however, and as expressed by one interviewee the unique model of the Australian site is a direct attraction:

My peers, who are academically minded surgeons have gotten to the point in their careers, where they just feel they're not doing any of the roles well. Because of the time and financial constraints on each of the aspects of the three roles - so academic work, public and private work - and this is a real problem with the structure of particularly academic surgery in this country... Apart from here really there's no other arrangement where it's possible to break away from that.

Structures for the engagement of doctors

Interviewees at the Australian site described three major structures for the engagement of doctors within the organisation being: three practicing medical executive leadership positions, the Clinical Program and Discipline structure (Figure 3) and the organisation’s committee structure (especially the relatively new Clinical Executive Committee and Clinical Leadership Council), with nine core committees chaired by a medical doctor (Figure 4).

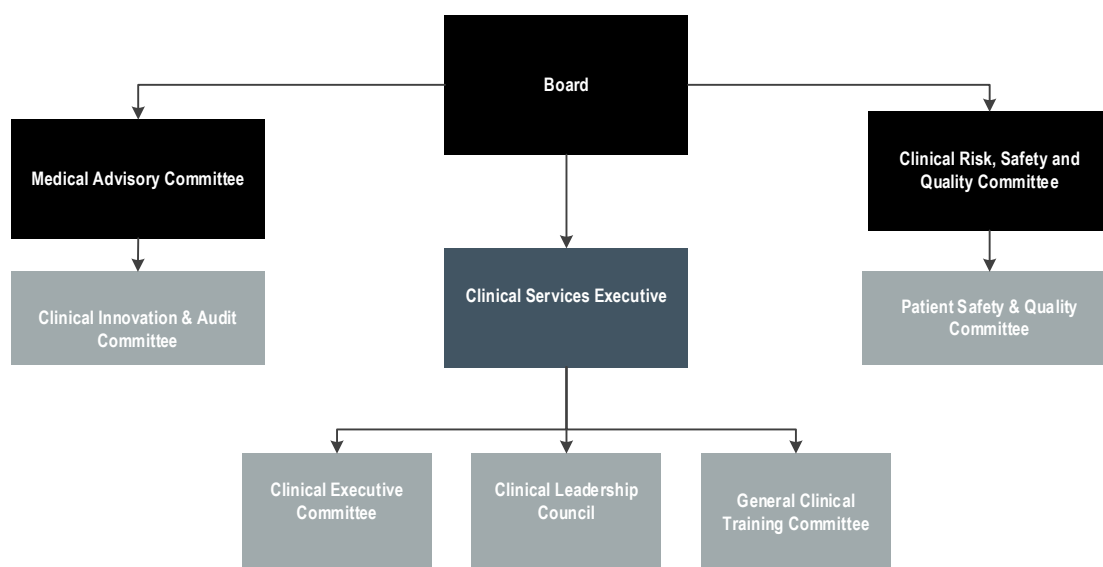


Figure 4: Australian site committee structure (medical led core committees)

Source: Author’s conceptualisation

The Clinical Leadership Council (CLC) and Clinical Executive Committee (CEC) were described by each interviewee as relatively new forums for the engagement of doctors in the decision making of the organisation. The CLC was described as a forum *“where the heads of each clinical program and discipline come together [in an] information sharing, getting to know each other”* setting. The CEC was described as a forum that *“does some more strategic thinking project-based work to make recommendations”* and *“provides a clear pathway for clinician involvement in organisational decision making”*. The consensus was that the CEC is a very good forum for active engagement, with good attendance and robust discussion and debate, where the views of the members are taken on board and the members feel very engaged. In terms of the CLC and broader clinician body however, all interviewees described being early on a journey, exemplified in the following quote:

I think getting that collaboration and participation happening is the first step. Are they empowered to make decisions? Not really at the moment, but if you look at mature health systems where clinicians lead, they are empowered and they have budgetary control and that's where I'd like to end up. I would like those individual clinical disciplines or bigger groupings of disciplines to have a budget to control that they can then make decisions about how they distribute funds to themselves and for the benefit of the organisation.

Perceptions of doctor engagement

Anecdotally, doctor engagement at the Australian site was described by one leadership interviewee as being variable to low:

I think it's still low, I think the deep cultural approach to private medicine in this country has been very personally focused, very individual clinician focused. So, there are some people who are obviously engaged and some who see that as the right way to practice medicine, but it's the minority. The question will usually be what can the hospital do for me... rather than it being the other way around. So, it's low but I think it's low on a subconscious level. I think most people would consider themselves to be engaged but just don't recognise what an engaged clinician really means and what that sort of professional satisfaction would be... so it's not a conscious choice, it's just such a deep cultural ingrained approach to medicine.

It was also observed that there were a good number of individuals and groups that were both personally and organisationally committed. Part of the definition for this included doing most of their work at the institution (not the norm), or their public work at a public hospital and all their private work at the institution.

Expectations of participation in academic activities

All interviewees at the Australian site described a minimum commitment to teaching medical students and junior doctors as being an expectation – although one that is not particularly well communicated at inception, nor enforced. In terms of research, the expectation extended to enrolling patients in discipline related clinical trials and quality improvement activities. There

was consensus that conducting higher order research and clinical trials should be reserved for those well trained to do so.

4.2.2 USA site overview

Organisational context for the study

In contrast to the Australian site, USA site interviewees described the challenges of doctor engagement in a mature, highly bureaucratic Academic Medical Centre (AMC). With most doctors being University employed, the challenges faced by the USA site were reported to extend further towards achieving the appropriate balance of clinical care and academic work (given revenue drivers are largely clinical), providing transparency in decision making, and keeping doctors connected to their individual purpose and goals:

At a lot of academic health centres, we haven't done as well as we could keeping them [physicians] connected to, why does this matter to you? and why is the work that you're doing important? And so, even though it is important, they lose sight of it. And I think that's connected to ... the processes and systems that they're asked to go through, becoming so frustrating and burdensome that it lowers the level of engagement... [and then there's balancing] the academic piece... and clinical piece of what they're supposed to do... I think if that balance was better, it would be more satisfying for them.

The physician leadership structure in USA AMCs is traditionally well defined in clinical departments (dating back to the 1930s) and divisions of those departments (being an evolution of the 1950s) [144]. The department structure has been criticised for its historical encouragement of siloed behaviour, but it, along with divisions are the driving force for achieving excellence across the tripartite mission [144]. The USA site was described by interviewees to be following this traditional model as described in figure 5.

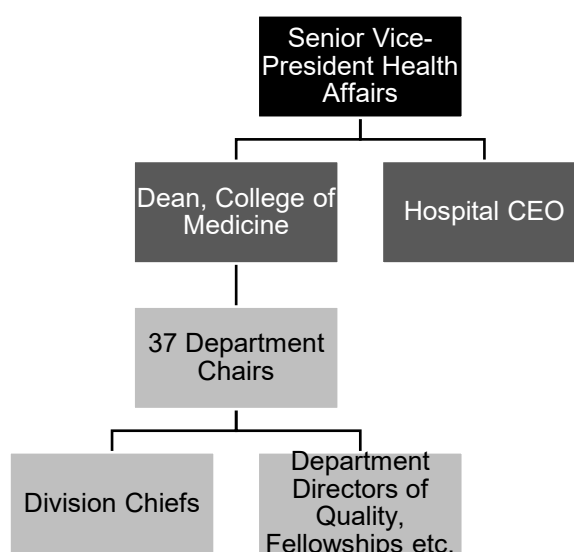


Figure 5: Clinical leadership structure at the USA site

Source: Author's conceptualisation

Structures for the engagement of doctors

Interviewees at the USA site emphasised the Departments as the predominant structure for the engagement of doctors within the organisation. The institutional level College of Medicine and the Hospital as well as organisational level committees, were cited as secondary structures for engagement (Figure 6). At the Department level, opportunities for doctor engagement include taking responsibility for tasks such as coordinating trainees, lecture series, quality, continuing education events etc. which come with various time allocations and salary recognition (or not) depending on the size of the role. Formal remunerated leadership roles include Division Chiefs and Department Chairs. The expectation is that individual doctors engage with the organisation through these leadership positions. It was noted that a smaller subset of doctors gets involved in cross-departmental opportunities, with the bulk of the work occurring within Departments. The pathway for those wanting to engage who are not in leadership positions was described as follows:

For the person who hasn't already been tagged as a leader to get involved in those cross departmental activities, I like to say at *USA site*, this is a federalism issue. It's the equivalent of having national and state governments with departments like state governments, department chairs like governors and the College of Medicine overall like a federal government. And so, the key is getting the balance of the federalism right.

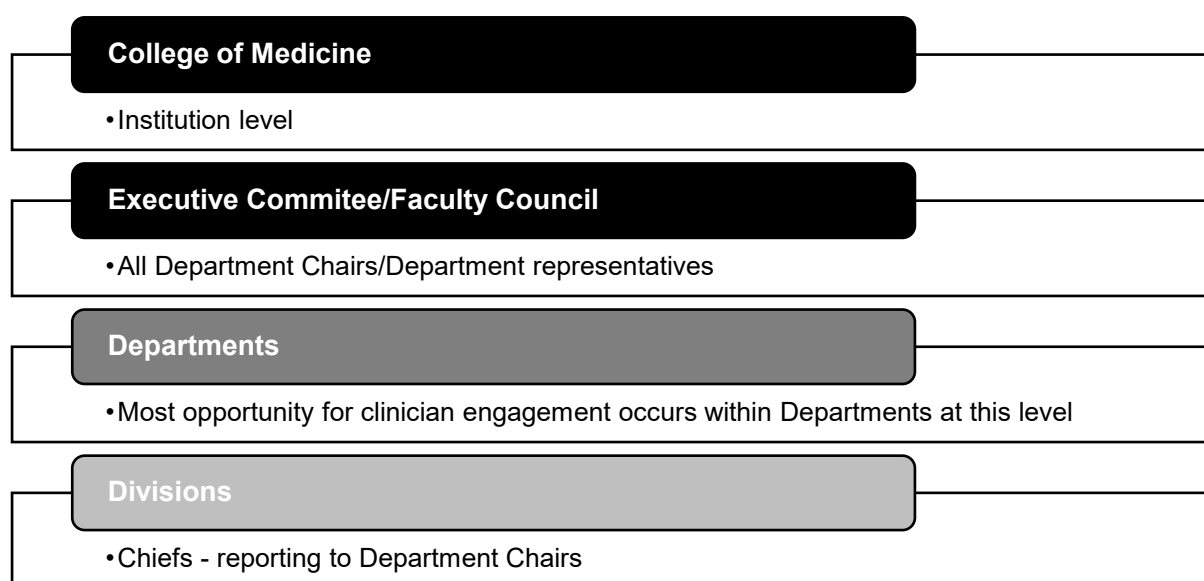


Figure 6: USA site structures for doctor engagement

Source: Author's conceptualisation

The variability in approach to leadership of Departments was described as a challenge:

Inside of departments some make that a democratic type of activity and some of them make it a very autocratic type of activity, and I think that neither one of those creates very activated physicians. Certainly, if its autocratic people don't develop their skills, and if it's just purely democratic then you're not getting anything done ... and people ... don't have a common goal. So, we have both of those and then we have some people who get the right mix.

Organisational level committees of Department Chairs and leaders were downplayed as forums for engagement noting *“that's not physician engagement, that's not the people who are coming in each day doing the work, they're not there at the coal face.”* But the importance of having such committees was also acknowledged:

We have it and that's the key - to make sure it's a constant and to constantly be intentional about this, to make sure when we get them all together it doesn't become a show and tell informational setting. You have to have things that are actionable that they actually have to do. And I think too often where we don't get that done, we'll have a meeting of very accomplished, very valuable people taking a fair amount of time ... and we didn't get the most out of that group.

The difficulties of engaging across the system were also highlighted by one interviewee:

We have the hospital on this side, and then the faculty on this side and so oftentimes part of the disengagement is having physicians wanting to do something here, but they can't move the needle because the hospital doesn't want to do something at the same time.

As distinct from the Australian site, the USA site has a structured investment in in-house programs for doctor leadership development. This is important because of a documented tendency for medical leaders to be willing amateurs as opposed to professionals trained in leadership [145]. The informal conversations had between physician leaders participating in these programs was described as very powerful in terms of collaboration and engagement *“that's where they're really creating the learning themselves, they're figuring out what actually would work for me”*. The selection for and structure of these programs was scrutinised by one interviewee:

I don't think we should send people off to courses and put them in classes and expect that they'll become leaders. I think when we identify them, we should figure out ways to grant them the opportunity to hone their leadership skills by practicing them in a small way and then a little bit of a larger way and keep going.

Perceptions of doctor engagement

Whilst one interviewee thought the engagement level of doctors at the USA site was lower than it had been in the past, the others described it as being highly inconsistent across a large physician body. Within Departments, attendance at meetings was described as highly variable between 10-75%. Low attendance was put down to doctors feeling like their broader contribution doesn't make a difference, so they instead focus on what they see as the core of their job - seeing patients.

Expectations of participation in academic activities

As described in the interviews, expectations of scholarly activity vary at the USA site depending on the terms of the employment contract. The minimum is some scholarly production and

teaching of students through clinical interaction, but there are higher and more defined bars of achievement depending on level of position, promotional pathways, and level of protected time for research or teaching. Balancing the clinical and academic output of each Department is the responsibility of the Department Chair.

4.3 Defining doctor engagement (and disengagement)

There was a general lack of shared understanding of the concept of clinician/physician engagement, both within and between the two study sites. Themes emerged at the organisational level with engagement being associated with leadership and commitment to organisational goals. At the individual level, engagement was said to be related to feeling empowered to make a meaningful impact, staying connected to personal goals, and achieving mastery.

Doctor engagement was associated with clinical leadership by two interviewees. They noted the importance of good clinician leadership in achieving broader engagement, recognition of the importance of clinical leadership by clinicians and organisations and the importance of clinician leadership in driving positive outcomes for the organisation.

Almost all interviewees discussed an element of doctor engagement being commitment to the organisation, investment in its success, and acting for the greater good, rather than in self-interest. As one interviewee put it figuratively, *“I think an engaged physician is an owner, you know, rather than a renter.”* Interviewees’ comments noted a need for doctors to make a shift from being focused on individual excellence in order to achieve health system improvement and transformation. At a more practical level, interview participants at the Australian site described engaged doctors as being those that see the organisation as their base and main place of work.

Several interviewees also described a willingness for active participation in the organisation as synonymous with engagement. They see the doctors who bring forward ideas, are solutions driven, willing to engage in dialogue and partnership with administration, participate in initiatives, and are willing to invest the time and effort into making things happen, as being engaged. These interviewees also described an energy and excitement that exudes from engaged doctors, as they feel empowered to make changes, and have pride in the institution at which they work.

At an individual level, two interviewees talked about engaged doctors being those that can stay connected to their personal purpose and goals at work. This was not something picked up in the literature and was therefore added as an item in the survey tool. One of these interviewees summarised this connection alongside the facilitation of mastery in terms of an engaged doctor as follows:

I would define engagement by saying, you create an environment of high trust, where people are able to stay connected with why what they're doing matters to them personally and organisationally, where you limit the barriers that are created by the processes, and you give them a chance to get better, and they're going to be engaged.

Most interview participants spoke of disengagement as being the opposite of engagement; however, some areas of distinction were highlighted. Interviewees specifically discussed disengagement in terms of being unable to process different points of view, being overwhelmed by their level of work, losing sight of why they got into academic medicine, not participating beyond their individual patients, not seeing the organisation as their base for work, having low trust and a high level of suspicion in the organisation, not feeling valued, and being visibly frustrated.

4.4 Predictors and detractors of doctor activation

As part of the semi-structured interview, each participant was read the definition of doctor activation being *the ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient-centred care*. They were then asked to hypothesise potential predictors and detractors of activation. The results have been themed where possible and are summarised below (Table 5).

Table 5: Hypothesised predictors and detractors of doctor activation

Predictors of Doctor Activation	Detractors from Doctor Activation
Security in own ability and position in the organisation.	Insecurity
Participation in teams outside work – sports, community, military	Value their individual sovereignty
Ability to stay connected to personal goals at work	Burnout
Amenable organisational processes and culture – positive environment	Unjustified bureaucracy – frustrated by systems and processes
Employment or revenue share model as opposed to just being accredited (Australian site)	Late career – burnout (USA site)
Culture being one of high trust	Lack of transparency over why decisions are made (USA site)
Ability to continue to develop within the organisation	Participation in leadership training – if what is learned is not modelled by leaders in the organisation
Those in leadership positions	Lack of understanding of leadership and teamwork
Ability to contribute to and influence the success of the organisation	Lack of health system understanding
Financial security	Early career – unstable income (Australian site)
Good Department/Division Leadership (USA site)	Poor Department/Division Leadership (USA site)

Predictors of Doctor Activation	Detractors from Doctor Activation
Alignment with mission and goals of organisation, enterprise level goals	Doctor not being able to see ‘what’s in it for me’
Larger time commitment to institution (Australian site)	

4.5 Communication and relationships

Despite seeing communication as pivotal to engagement, all interviewees discussed significant challenges in communicating effectively with doctors. As expressed by one interview participant at the USA site:

This is important because I’ve been doing this for a while, and I don’t know how to successfully communicate. I know it’s inevitable that...there will be something that we have talked about for six months, in every meeting that people are at. It will have been on “*The Bridge*”, which is our web page, we will have sent out emails, have gone through it in smaller settings with people, one on one. Then, whenever whatever it is happens, folks are going to say, “nobody ever told me that was happening”, and you just don’t know what to do.

Email was described as a dominant form of regular communication at both study sites, though it was acknowledged by some that this was not particularly effective in reaching doctors, nor engaging in meaningful two-way dialogue. It was also approached with some caution, noting individual interpretation was often not aligned with intent.

At both organisations the ideal structures for communicating up and down were asserted to be the Departments/Disciplines. At the Australian site, it was acknowledged that communicating through the Discipline Heads was often not effective, given many of the Disciplines do not have well-developed structures for collaboration and communication through which to cascade the information. At the USA site it was felt that most issues were communicated up through Departments, but the disadvantage of this was the risk that good ideas and voices were not heard or recognised because of the individual dissonance of the Chair.

The relationship between senior doctors and administration was described as generally respectful and positive at the Australian site by all interviewees. It was more variable at the USA site described as ranging from “*healthy*” to “*cordial*” to “*toxic*” depending on the Department. This relationship is potentially significant given effective medical leadership has been shown to rely on non-medical managers acting as brokers between professional groups [146]. At the USA site one interviewee reported a sense over the past few years that many decisions had been made without transparency or input from doctors. The difficulties and benefits of operating in a large bureaucracy were also described by one of the USA site interviewees in relation to their model being akin to Federalism:

People predictably focus on whatever their perspective is and it's not going to be the same. And it shouldn't be the same, because if it was the same then the States [Departments] wouldn't have any governors [Chairs]. If the governors didn't worry about their state, and if the federal government [College of Medicine] didn't worry about the whole then we wouldn't have a federal government. So, part of this place that has people bump into each other is healthy, because that's what you need to have federalism.

4.6 Incentives and strategies to improve activation

Incentives to engage at the Australian site were reported to be monetary (individual and/or group performance incentives tied to financial, quality, and scholarly KPIs) and positional (academic title and promotion pathway). Interviewees described wanting to evolve incentives to encourage a shift from the consideration of individual interests to the interests of a broader group or organisation:

If they get paid individually, that's what's going to motivate them. If they get paid as part of a team... that's going to change the way they feel. But that's a very controversial issue itself because it undermines the very individual nature of the way people feel they should practice in Australia. But I think that's an important aspect of how you might change that behaviour. And I think then if the business as opposed to the individual is the one who generates the business... I think that also changes. So, I think it's about several factors, ... but ultimately, it's about how do you change the nature of someone seeing themselves as driving their own future individually, to them being part of an institution that they're dependent on ... and there's a bit of a gap in that in the way we actually operate currently.

At the USA site interviewees described incentives as being tied to achieving clinical activity as measured by relative value unit (RVU) targets. This has led to a perception that the balance of clinical and academic work is tipped very clinically “*as that’s what drives the revenue*”. A comment was made that there was a desire to want to incentivise engagement, “*but in order to incentivise it you’ve got predictably and reproducibly, simply measure it* [and there is currently no way of doing this].”

By way of strategies to improve activation, interview participants discussed: structure; leadership; creating a culture of trust and recognition; graduated exposure, training, and development; strategy, business development, research, and project support; recognising non-clinical contributions; and trying to make doctors feel valued. All participants recognised room for improvement within their organisations in terms of actively fostering doctor engagement or activation.

At the Australian site, interviewees discussed having a good foundational structure on which to leverage doctor engagement strategies. As described above (section 4.2.1), the Program and Discipline structure as well as the Clinical Executive Committee and management support for these were described as present and effective. Layered on this was a recognition that more

needed to be done in terms of targeted strategies, ideally segmented according to career stage (early, mid and late). At the early career stage, it was suggested that support might include business development and avenues to fast-track growth, as well as research and clinical trials support. For those later in their careers, it was suggested that academic titles, development opportunities and leadership positions may be more effective. Overall, it was also suggested that *“recognising the non-direct clinical work contributions”* was also important, as traditionally rewards and recognition (e.g., marketing and promotion) tend to favour those that are contributing most to the bottom line rather than those that are most engaged and contributing to both the clinical and academic missions, as well as the success of the overall organisation.

At the USA site, it was felt that cultivating effective leaders would lead to greater overall doctor engagement:

I think individual leaders within areas have a much greater impact than they realise in terms of creating an environment of high trust, of a clear and shared sense of mission and vision and trying to at least limit the frustrations around stupid processes and bureaucracy.

Whilst training and investment in leadership is provided at the USA site, the application process and training in and of itself is felt to be insufficient. Firstly, the selection process for training involves existing leaders identifying those who are promising future leaders – but there’s no objective way of determining that. As one interviewee put it: *“it’s not a terribly great way to pick your leaders, because it may well be the best future leader is somebody that I had a difficult time working with but they’re never going to get chosen for leadership development class”*. Secondly, it is felt that there are not enough places in the leadership development program to accommodate everyone (20 – 25 doctors are put through every 6-9 months). Finally, there was some scrutiny over the utility of the way training is undertaken and whether that form of training is going to produce an engaged physician leader. Instead, or in addition, it was felt that training people in an experiential graduated way, how to engage and lead, would potentially be more effective. In this way, doctors would be moved from a place of individual excellence in their own domain, to being given graduating levels of responsibility and accountability, and not moved up until they’d mastered that level. An analogy was provided by one interviewee:

I mean if we go back to military organisations, I don't think they do that. I don't think they have somebody as a foot soldier for an entire career and then in the last month make them the general, I have a feeling they had incremental levels of responsibility over time. We don't do that in healthcare.

Interview participants across both sites agreed that they’d like to have doctors actively engaged in all facets of running the organisation but noted that was easier to achieve in some areas than

others. In particular, anything that involved strategy or improvements to the doctor's direct clinical work is generally easier to engage them in at a high level. It is the more mundane areas of day-to-day work where it's more challenging. In terms of starting smaller and building a culture of engagement it was suggested that a good approach would be to *"do things where you have the most power to enact changes quickly, so you can see these positive results of their engagement to promote further physician engagement."*

4.7 Measurement of activation

None of the interviewees at either site felt they had a useful way of measuring doctor engagement in its active form. Both sites had previously implemented generic 'engagement' surveys that looked more at satisfaction. Both sites felt that a tool such as the MD-A would be useful in measuring engagement/activation as a basis to implement targeted initiatives to improve and then re-measure to evaluate their effectiveness. It was caveated that the historical response rate to surveys by doctors at both organisations was extremely poor, or not representative.

4.8 Summary of chapter 4

This chapter summarised the results of the qualitative leadership interviews conducted at the two study sites. It explored the site-specific contexts for the study as well as broad themes of structure, leadership, communication and relationships, and incentives and strategies, in relation to doctor activation.

CHAPTER 5: DOCTOR ACTIVATION SURVEY DEVELOPMENT & VALIDATION

5.1 Overview of Chapter 5

Chapter 5 outlines the development and validation of the Measure of Doctor Activation (MD-A). Designing the MD-A involved four stages of development and validation as presented below.

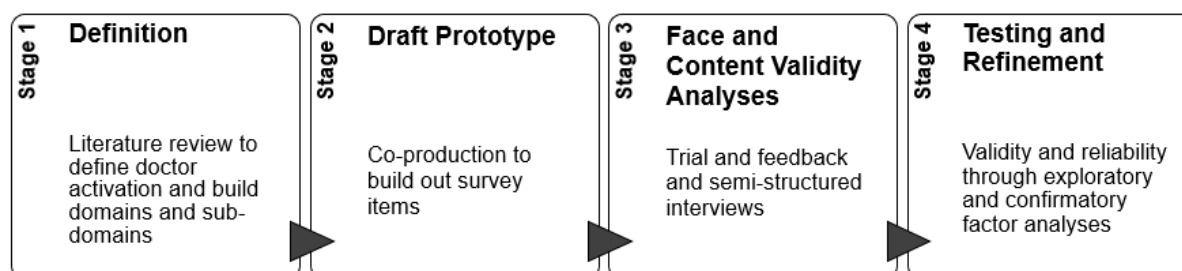


Figure 2: Stages of MD-A Development (reproduced from Chapter 3)

5.2 Stage 1: Defining doctor activation and its domains and a scale of measurement

A narrative literature review of doctor engagement (physician engagement and clinician engagement) was conducted, combining concepts of engagement (of clinicians/physicians) and activation (as successfully applied in the patient context) to produce a definition of doctor activation as: *the ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient centered care*. The literature revealed several commonly cited attributes of doctor engagement. These were thematically categorised below (Table 6), drawing on domains in pre-existing engagement survey tools and in consultation with Gray and Parvataneni. These attributes and mapped domains were used as the basis for forming domains and survey items in the development of the survey tool.

Table 6: Attributes of Doctor Engagement

Engagement domain	Attributes
Individual drivers and performance	<ul style="list-style-type: none"> Professional fulfillment and impact [68] Meaning in work [68, 86] Ability to maintain work-life balance [86] Sense of value within the larger context [2, 124] Personal accountability [2] Personal leadership capability [147]
Work absorption and satisfaction	<ul style="list-style-type: none"> Satisfaction with role and capacity for productivity [2, 124]

Engagement domain	Attributes
	<ul style="list-style-type: none"> • Immersion in work [2] • Interpersonal relationships and connectivity with colleagues [2, 41, 77, 86, 90, 92, 93, 124] • Perception of performance feedback, incentives and recognition - value vs volume based [2, 41, 46, 87, 98, 124] • Perceived involvement in deciding how work is done, making suggestions for improvement, goal setting, planning and affecting outcomes/having impact [46, 58, 68, 124] • Ability for professional advancement [2, 68]
Work efficiency and ability to leverage resources	<ul style="list-style-type: none"> • Doctor and management/administration alignment and communication [46, 64, 148] • Control/flexibility [86] • Workload, sense of productivity/effectiveness [86] • Targeted development and training opportunities [68, 71, 89, 124] • Perception of operational efficiency [46, 86] • Perception of and availability of personnel/resources to undertake broader work (IT, project, data etc.) [46, 83, 86, 99]
Organisational dedication and commitment	<ul style="list-style-type: none"> • Perceived presence of <i>and</i> awareness of institutional strategy • Connection to institution and values alignment [2, 53, 69, 86, 149] • Degree of perceived support from institution and work unit [2, 124] • Engagement in “organizational citizenship” [2] <ul style="list-style-type: none"> ○ Proclivity toward praise of the organisation ○ Interest/effort in altruistic helping behaviours ○ Degree of psychological safety: willingness to challenge status quo at risk of social capital ○ Teaching/knowledge dissemination/succession planning
Healthcare system understanding and navigation	<ul style="list-style-type: none"> • Understanding the greater context and spectrum of healthcare system issues and models [68, 124] • Understanding conflicting agendas (i.e. cost vs access vs quality vs choice) and reimbursement paradigms [4] • Knowledge of how to undertake/initiate a QI/other project [147] • Quality improvement viewed as inherent responsibility as opposed to burden [147]

The review revealed that doctor engagement has significant benefits for patients [1, 5, 48] and organisations [1, 5, 6, 8, 10, 49-58] including improving hospital performance [59]. As documented in Table 6 above, the review of the literature alluded to the following high-level

attributes of an activated doctor: (1) individual drivers of performance; (2) work absorption and satisfaction; (3) efficiency of work environment and ability to leverage resources; (4) organisational dedication and commitment; and (5) understanding of and ability to navigate the healthcare system. These five broad attributes were used as the basis for the creation of domains and sub-domains to construct the survey tool.

Separately, in creating a scale by which to assess the level of engagement and activation of doctors, several considerations and perspectives were combined (see Table 7 below). The scale represents an adaption of the physician activation scale proposed by Gray et al 2020 [4] and drawing concepts from the Engagement spectrum as described in Rabkin et al 2019 [58], the NHS's Medical Engagement Scale 2008 [124] and Advisory Board's Creating System Citizens Paper [150]. These changes were made to better align with the body of literature reviewed and data obtained from the interview process.

Table 7: Scale of Doctor Activation drawn from [4, 58, 124 and 146].

Level of Doctor Activation	Description
1 – Resistance and Agnosticism	Doctors have limited awareness of their role in the health system, little organisational leadership ability and organisational alignment and are overwhelmed by bureaucratic processes. Doctors feel powerless.
2 – Compliance and Cooperation	Doctors have some knowledge and desire to engage in innovative care processes, engage in discussion and follow direction on common objectives, but feel that the status quo prevails. Doctors feel frustrated.
3 – Collaboration and Contribution	Doctors are action-oriented and will participate in local system or performance improvement initiatives and share decision making with the organisation, but rarely engage on a larger scale. They push against the system if needed but are hesitant to risk new uncertainty. Doctors feel challenged.
4 – Leadership and Transformation	Doctors have high self-efficacy and overcome system inertia and barriers to identify issues and design, operationalise, measure and/or educate on novel and transformative delivery and payment models and solutions. Doctors feel engaged and empowered.

5.3 Stage 2: Preliminary MD-A tool development

Developing the preliminary MD-A item pool involved the creation (through the co-production process) of an additional domain to those identified in the literature review, titled “Engagement in team and value-based care”. This was created following discussion of the research team in recognition of the contemporary movement of progressive health systems

towards the delivery of value-based care, and the importance of doctor engagement in this space [20]. The process then involved adapting several relevant items from existing scales including the Utrecht Work Engagement Scale (4 items), Medical Engagement Scale (5 items), SCORE™ (5 items), Best Practice Australia Organisational Culture Survey (6 items), The Safety Attitudes Questionnaire (2 items), and the Patient Activation Measure (1 item). An additional 20 items - being novel measures in the context of doctors - were developed through the co-production process with the research team, especially Gray and Parvataneni as authors of the published framework of ‘physician activation’ [4], as well as through the face and content validity process which follows. In designing the new items, the authors engaged in extensive antagonistic discussion from real world perspectives of doctors, clinician leaders, and executives in the healthcare systems of the USA and Australia across 15-hour long meetings. A total initial item pool of 39 items were developed, mapped to the following 6 domains: Individual drivers and performance (7 items), Work absorption and satisfaction (7 items), Work efficiency and ability to leverage resources (6 items), Organisational dedication and commitment (8 items), Engagement in team and value-based care (5 items), and Healthcare system understanding and navigation (6 items), (see Appendix B).

5.4 Stage 3: Face and content validity analyses

Prior to administration of the survey, face and content validity analyses were completed by circulating the 39-item prototype tool to 27 medical doctors from Australia (14) and the USA (13) from a variety of hospitals and health systems external to the study sites. All items were answered on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). The doctors were asked to complete the online version of the tool and provide written feedback in relation to ease of understanding, ease of navigation and completion, relevance to the definition of activation provided, and whether anything fundamental was missing. The survey was also circulated to participants in the semi-structured interviews to glean their feedback.

Data collected from the face and content validity process suggested that the survey was well structured and appropriately brief for the audience. Feedback resulted in changes being implemented including breaking up the pages and adding a progress bar as well as flipping the question that required a negative response to be worded positively. Additionally, it was suggested that the item “My hospital/health system management seeks and implements changes based on input from doctors to improve care delivery” be broken up into two items in recognition of their experience that seeking and implementing feedback are two distinct issues, with seeking occurring far more often than implementing. Similarly, one of the interview participants suggested adding a question to support “I would intervene with a colleague who was not demonstrating our organisation’s values” with “*I would feel supported by my institution* in intervening with a colleague who was not demonstrating our values”, with the latter in their experience, less likely to occur. Both suggestions were implemented. An

additional item was also added after a semi-structured interview participant commented that the doctors that can stay connected to their personal goals and purpose at work are the ones most likely to stay activated within a health system over time. This was consistent with a study that revealed that doctors who spend greater than 20% of their time on the work activity that is most meaningful to them are less likely to experience burnout [151]. The item “I am able to stay connected to my personal goals and purpose at work” was accordingly added to the individual driver’s domain.

The face and content validity analyses increased the item pool to 43 (see highlighted items in Appendix B). These were mapped to the 6 domains as follows: Individual drivers and performance (8 items), Work absorption and satisfaction (7 items), Work efficiency and ability to leverage resources (8 items), Organisational dedication and commitment (9 items), Engagement in team and value-based care (5 items), and Healthcare system understanding and navigation (6 items).

5.5 Stage 4: MD-A testing and refinement

5.5.1. MD-A survey

The survey was designed to be answered on a six-point Likert scale (1 = strongly disagree to 6 = strongly agree). In addition to the 43-item pool, several demographic items including age, gender, years practicing, years at institution, specialty, number of days working at institution, participation in committees, contractual arrangement with organisation and formal leadership training were added to enable exploration of predictors of activation. These questions were worded and tested for relevance across the two study sites. Two other questions were added as a means of measuring the likelihood of tangible results arising from doctor activation being “how many new model of care/quality improvement/financial optimisation/strategic planning initiatives have you been involved in at this institution in the last 18 months?” and “how many new model of care/quality improvement/financial optimisation/strategic planning initiatives have you proposed, initiated, or led at this institution in the last 18 months?”.

5.5.2. Data analysis

Respondent data with a missing rate greater than 15% were excluded from the analyses. Any remaining missing values were assigned by applying the Expectation Maximisation Algorithm within SPSS version 28. Valid data were received from 230 respondents across both study sites. Frequency distributions were calculated to determine whether items violated the assumption of univariate normality (i.e., skewness index ≥ 3 , kurtosis index ≥ 10) [152].

5.5.3. Descriptive statistics and exploratory factor analysis results

An exploratory factor analysis (EFA) was performed on the draft 43-item instrument to determine the number of underlying factors and to undertake any necessary initial item reduction. Maximum likelihood factoring with Promax rotation was performed, with a view to retaining factors of eigenvalues >1 . This analysis found that there were four factors with eigenvalues greater than one, accounting for 54.83% of the variance. These four factors replaced the initial six and were subsequently labelled: 1. Organisational Drivers, 2. Individual Drivers, 3. Engagement in Academic and Value-Based Care, and 4. Health System Understanding. For the purposes of the EFA, items were retained if their primary factor loading was $>.5$. Through this process, five items (Q1_5, Q2_5, Q4_3, Q4_6 and Q5_5) were eliminated (Appendix C).

5.5.4. Confirmatory factor analysis and reliability results

The remaining items were psychometrically evaluated via a confirmatory factor analysis (CFA), using a two-stage process. Firstly, to refine the initial item pool, four one-factor congeneric models were run for each of the suggested four domains using AMOS, version 28. The analytic process involved removing one item at a time from each factor model in accordance with the following strategy: (1) removing items with the lowest observed factor loadings with a view to maintaining theoretical content and meaning of the proposed construct; (2) removing items whilst maintaining at least three observed variables per construct; and (3) only removing items if the resulting model demonstrated an improved model fit. Differences in model fit were assessed using the chi-square difference test [153].

Secondly, the full factor model was run with the reduced item set, with each item loaded on the factor it purported to represent. The 18-item four-factor model produced an excellent fit to the data, $\chi^2(129) = 227.85$, $TLI = .94$, $CFI = .95$, $RMSEA = .06$. As a result, no further item refinement was required. The factor loadings for each of the 18-items is shown in Table 8, ranging from .55 to .90 ($M = .75$). Cronbach's alpha for the final items is also shown (Table 8), demonstrating that all four factors demonstrated high levels of reliability.

Table 8: Confirmatory factor analysis results for reduced four factor model

Construct	Item	Factor loadings	Coefficient alpha
Organisational Drivers	Q3_5	0.61	0.89
	Q3_8	0.80	
	Q4_1	0.75	
	Q4_8	0.87	
	Q4_9	0.74	

Construct	Item	Factor loadings	Coefficient alpha
	Q6_6	0.76	
Individual Drivers	Q1_1	0.71	0.86
	Q1_2	0.80	
	Q1_3	0.82	
	Q1_8	0.84	
	Q2_2	0.63	
Engagement in Academic and Value-Based Care	Q4_7	0.55*	0.76
	Q5_2	0.73	
	Q5_3	0.78	
	Q5_4	0.65	
Health System Understanding	Q5_1	0.67	0.82
	Q6_2	0.80	
	Q6_4	0.90	

**This item was added in (although below 0.6) following review by the authors and a sense that an originally intended and important element was missing.*

Correlations between the factors were significant but low to moderate (range = .22 to .48), suggesting good discriminant validity between factors [154]. The final model fit results are presented in Appendix D. The final validated MD-A is an 18-item, four domain survey as presented in Table 9 below.

Table 9: Final Validated MD-A – Domains and Items

Domain	Item
Organisational Drivers	My institution recruits high quality staff
	My hospital/health system management implements changes based on input from doctors to improve care delivery
	My institution has a strong sense of purpose and strategic direction
	My institution allows people to bring up problems and tough issues
	I would feel supported by my institution in intervening with a colleague who was not demonstrating our values
	My institution has a practical and effective quality improvement infrastructure

Domain	Item
Individual Drivers	My personal values align with my day-to-day work
	I find the work that I do full of meaning and purpose
	When I get up in the morning, I look forward to going to work
	I am able to stay connected to my personal goals and purpose at work
	I feel fully engaged and get carried away when I'm working
Engagement in Academic and Value-Based Care	I actively mentor junior staff and seek and foster talent
	I routinely seek opportunities to foster patient engagement, autonomy and shared decision making
	I routinely seek opportunities for interdisciplinary and multidisciplinary patient centred care
	I actively engage in evidence-based practice and seek practice-based learning opportunities
Health System Understanding	I have a robust understanding of how the health system values and reimburses the services provided by my specialty area
	I understand different models of healthcare delivery and their relative strengths and weaknesses
	I understand how healthcare is valued, funded and reimbursed

5.6 Summary of chapter 5

This chapter presented the results of the MD-A development and validation process. The result is a purpose designed, valid and reliable 18-item survey to measure the activation of doctors across four domains and in accordance with a four-tier developmental scale.

CHAPTER 6: DOCTOR ACTIVATION SURVEY RESULTS

6.1 Overview of Chapter 6

Chapter 6 provides the results of the Measure of Doctor Activation (MD-A) following administration at the two study sites. Firstly, the demographic details of participants at the two sites are outlined, highlighting areas of significant differences in the sample populations between the sites. Secondly, the process for developing a numerical score to correspond with the four-tier scale of activation is outlined along with the results of each site against this scale. Results within and between sites are then compared in relation to the research questions and specifically: providing a two country/site comparison of doctor activation, highlighting the predictors of doctor activation, the impact of activation on the delivery of tangible results, and a profile of activated doctors. Finally, the results of the qualitative component of the survey are analysed.

6.2 Overview and demographics of participants

Valid data were received from 230 respondents, 70 from the Australian site out of 730 who received the survey (9.6% response rate), and 160 from the United States site out of 1582 who received the survey (10.1% response rate). Respondents demonstrated significant differences in organisational profile between the two study sites (Table 10). Of note were:

- gender, with the Australian site having a significantly higher proportion of males [$F(1, 123) = 6.6, p = 0.011$];
- age, with the Australian site having a higher proportion of older doctors [$F(4, 225) = 2.5, p = 0.046$];
- years practicing medicine since graduated, with participants at the Australian site being generally more experienced [$F(4, 225) = 4.5, p = 0.002$];
- level of position, with the USA site having a higher proportion of respondents in a leadership role [$\chi^2(1, N=230) = 6.7, p = 0.006$];
- years practicing at institution, with participants at the USA site having worked at their institution longer [$F(6, 223) = 2.6, p = 0.019$];
- contractual relationship with the institution, with respondents at the USA site being largely employed [$\chi^2(2, N=230) = 128.9, p = <0.001$];
- formal study in leadership/management, with a higher number of participants at the USA site having completed training [$F(7, 222) = 103.1, p = 0.001$]; and
- days per week working at institution, with participants at the USA site working more days at the institution [$\chi^2(7, N=230) = 175.8, p = <0.001$].

Table 10: demographic information and profile of doctor by organisation

Characteristic	AUSSite N = 70 (%)	USASite N = 160 (%)	Total N = 230 (%)
Gender			
Female	15 (21.4)	61 (38.1)	76 (33)
Male	54 (77.1)*	95 (59.4)	149 (64.8)
Non-binary/Prefer not to say	1 (1.4)	4 (2.5)	5 (2.1)
Age group			
Up to 35	1 (1.4)	23 (14.4)	24 (10.4)
36-45	20 (28.6)	47 (29.4)	67 (29.1)
46-55	26 (37.1)*	46 (28.7)	72 (31.3)
56-65	18 (25.7)*	32 (20)	50 (21.7)
66 and over	5 (7.1)	12 (7.5)	17 (7.4)
Years practicing medicine since graduated			
1-10 years	2 (2.9)	39 (24.4)	41 (17.8)
11-20 years	24 (34.3)*	45 (28.1)	69 (30)
21-30 years	22 (31.4)*	46 (28.7)	68 (29.6)
31-40 years	16 (22.9)*	21 (13.1)	37 (16.1)
41 years or longer	6 (8.6)*	9 (5.6)	15 (6.5)
Level of position			
Fellow	3 (4.3)	4 (2.5)	7 (3)
Consultant/Attending	51 (72.9)	91 (56.9)	142 (61.7)
Clinical Leadership Role	16 (22.9)	65 (40.6)*	81 (35.2)
Years practicing at institution/tenure			
Less than 6 months	6 (8.6)*	6 (3.8)	12 (5.2)
6-12 months	2 (2.9)	7 (4.4)	9 (3.9)
1-2 years	3 (4.3)	8 (5)	11 (4.8)
2-4 years	7 (10)	36 (22.5)*	43 (18.7)
5-7 years	12 (17.1)	30 (18.8)*	42 (18.3)
8-10 years	18 (25.7)	16 (10)	34 (14.8)
Greater than 10 years	22 (31.4)	57 (35.6)*	79 (34.3)
Contractual relationship with institution			
Faculty/Health System Employed	20 (28.6)	149 (93.1)*	169 (73.5)
Clinical Associate License Agreement (revenue share)	4 (5.7)	0 (0)	4 (1.7)
Clinician Services Agreement/Faculty Group Practice	2 (2.9)	5 (3.1)	7 (3)
Private Practice Lease/Physician non- academic group practice	4 (5.7)	0	4 (1.7)
Accredited Practitioner/Self employed	40 (57.1)	1 (0.6)	41 (17.8)
Government Employed	0	5 (3.1)	5 (2.2)
Formal Study/professional development in leadership/management			

Characteristic	AUSsite N = 70 (%)	USAsite N = 160 (%)	Total N = 230 (%)
Yes	21 (30)	92 (57.5)*	113 (49.1)
No	49 (70)	68 (42.5)	117 (50.9)
Days per week working at institution			
Less than half a day	17 (24.3)	1 (0.6)	18 (7.8)
Half a day	10 (14.3)	0 (0)	10 (4.3)
1 day	13 (18.6)	0 (0)	13 (5.7)
2 days	10 (14.3)	1 (0.6)	11 (4.8)
3 days	12 (17.1)	4 (2.5)	16 (7)
4 days	3 (4.3)	5 (3.1)	8 (3.5)
5 days	5 (7.1)	87 (54.4)*	92 (40)
Greater than 5 days	0	62 (38.8)*	62 (27)
¹ Statistics presented: n (%)			
*Significant difference			

6.3 Scale of Doctor Activation

To enable the assessment of level of doctor activation in accordance with the four levels of the scale derived from the literature review, the standard deviation of 2.5 (rounded up to 3) was applied across the results. This enabled the development of cut scores that resembled a rough bell curve as shown in figures 7 and 8 below.

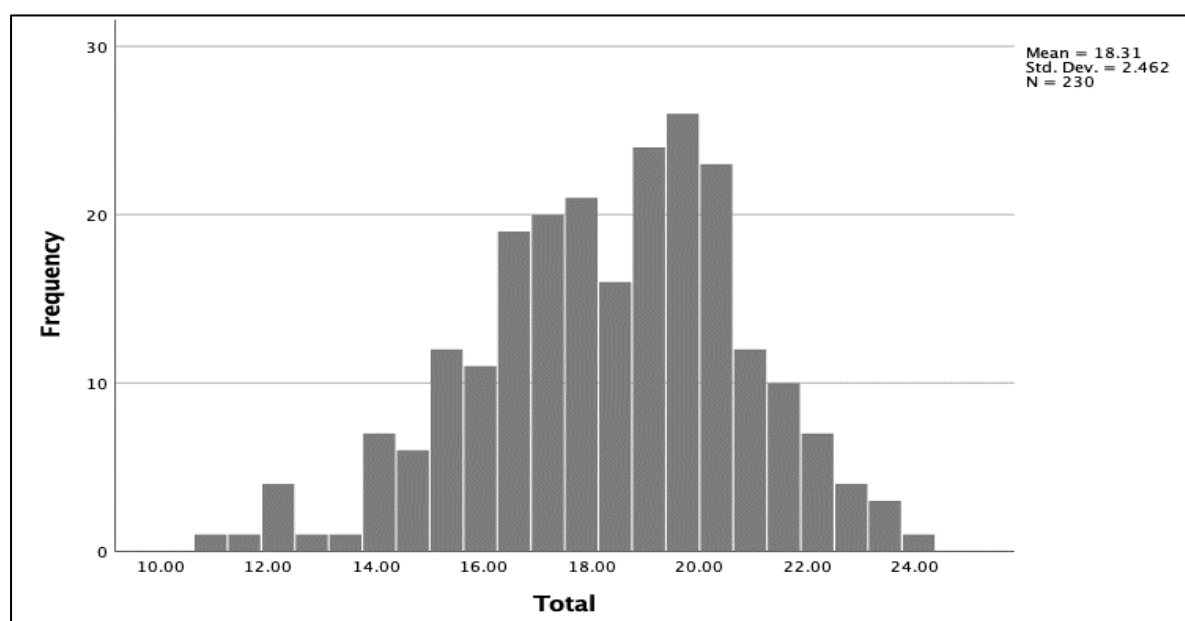


Figure 7: Distribution of total MD-A scores across both study sites

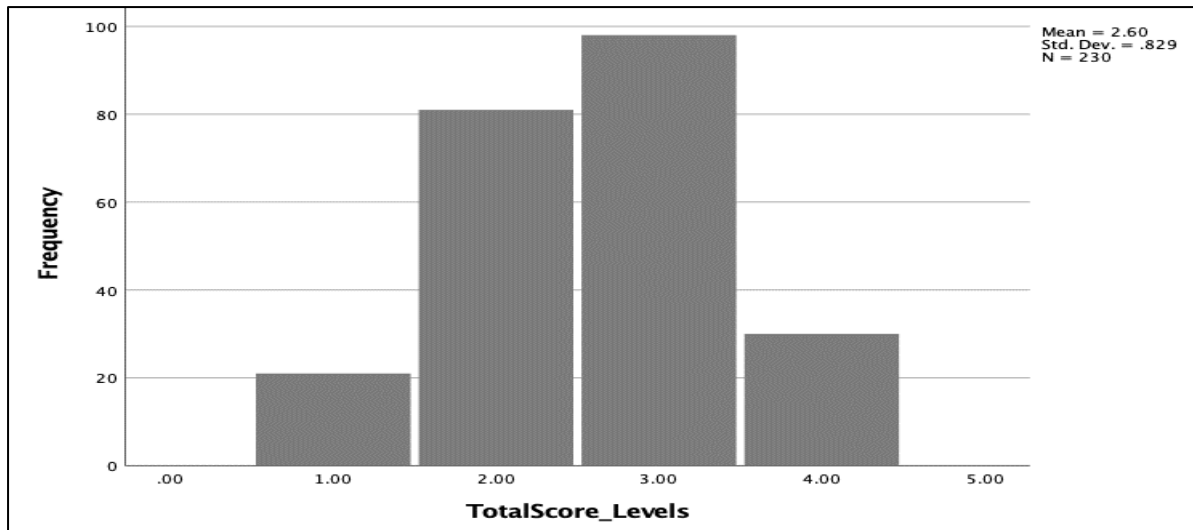


Figure 8: Distribution of total MD-A scores in accordance with four cut scores and corresponding levels of activation

The cut scores relating to each level of activation and combined percentages are displayed below (Table 11).

Table 11: Scale of Activation

Level of Doctor Activation	Description	Score	N=230 (%)
1 – Resistance and Agnosticism	Doctors have limited awareness of their role in the health system, little organisational leadership ability and organisational alignment and are overwhelmed by bureaucratic processes. Doctors feel powerless.	<15	9.1
2 – Compliance and Cooperation	Doctors have some knowledge and desire to engage in innovative care processes, engage in discussion and follow direction on common objectives, but feel that the status quo prevails. Doctors feel frustrated.	15-18	35.2
3 – Collaboration and Contribution	Doctors are action-oriented and will participate in local system or performance improvement initiatives and share decision making with the organisation but rarely engage on a larger scale. They push against the system if needed but are hesitant to risk new uncertainty. Doctors feel challenged.	18-21	42.6
4 – Leadership and Transformation	Doctors have high self-efficacy and overcome system inertia and barriers to identify issues and design, operationalise, measure and/or educate on novel and transformative delivery and payment models and solutions. Doctors feel engaged and empowered.	>21	13.0

6.4 Two Health System and Country Comparison of Doctor Activation Survey Results

Means and standard deviations for each domain and overall activation were compared at the two study sites. Respondents at the Australian site demonstrated significantly ($p < 0.05$) higher scores in the domains of organisational drivers [$F(1, 228) = 10.2, p = 0.002$], individual drivers [$F(1, 228) = 10.2, p = 0.002$], health system understanding [$F(1, 228) = 5.9, p = 0.016$], and total activation score [$F(1, 228) = 9.6, p = 0.002$], respectively. The results are displayed below (Table 12). In accordance with the scale of activation developed above, the USA site mean sits within the compliance and cooperation level (level 2) of doctor activation at just under 18, and the Australian site sits within the collaboration and contribution level (level 3) of doctor activation at 19.1.

Table 12: Comparison of activation scores by domain between the two study sites

Domain	AUSsite N = 70 Mean and Standard Deviation	USAsite N = 160 Mean and Standard Deviation	Overall N = 230 Mean and Standard Deviation
Organisational Drivers	(M = 4.3, SD = 0.8)*	(M = 3.9, SD = 1.1)	(M = 4.0, SD = 1.0)
Individual Drivers	(M = 5.1, SD = 0.6)*	(M = 4.7, SD = 0.9)	(M = 4.8, SD = 0.8)
Engagement in Academic and Value-Based Care	(M = 5.1, SD = 0.6)	(M = 5.2, SD = 0.6)	(M = 5.2, SD = 0.6)
Health System Understanding	(M = 4.5, SD = 0.9)*	(M = 4.2, SD = 1.1)	(M = 4.3, SD = 1.0)
Total Activation Score	(M = 19.1, SD = 2.0)*	(M = 18.0, SD = 2.6)	(M = 18.3, SD = 2.5)

*Denotes a significant result at $p < 0.05$

6.5 Predictors of Doctor Activation

Given the differences between the two organisations from structural and maturity perspectives as well as demographic differences in the respondent populations, predictors of high doctor activation scores were largely analysed separately for each study site. To understand correlations, one-way ANOVA analyses were utilised to explore the relationship between higher activation scores and potential predictors of activation. These included age, gender, length of practicing medicine, length of time practicing at the institution, completion of leadership training, number of days per week working at the institution, contractual relationship with institution and participation in institutional level committees.

At the USA study site significant results at the $p < 0.05$ level demonstrated that doctor activation scores were negatively correlated with length practicing at the institution overall [$F(1, 158) = 6.0, p = 0.015$] and highly significant specifically within the organisational drivers domain [$F(1, 158) = 14.2, p = < 0.001$]. Additionally, doctor activation was negatively

correlated with length practicing medicine since graduating from medical school for the organisational drivers domain only [$F(1, 158) = 4.6, p = 0.03$].

At the Australian study site significant results at the $p < 0.05$ level demonstrated that higher levels of doctor activation correlated with number of days working at the institution for the organisational drivers [$F(1, 68) = 4.8, p = 0.03$], engagement in academic and value-based care [$F(1, 68) = 5.1, p = 0.03$], and health system understanding [$F(1, 68) = 5.6, p = 0.02$] domains as well as overall [$F(1, 68) = 6.6, p = 0.013$]. Higher activation was also correlated with participation in institutional level key committees for the engagement in academic and value-based care domain [$F(1, 68) = 4.7, p = 0.03$]. Finally, doctor activation was correlated with a 'more engaged' contractual relationship for the organisational drivers domain [$F(2, 67) = 5.7, p = 0.005$] and overall [$F(2, 67) = 5.1, p = 0.009$].

Seniority within the organisation was explored across all respondents from both sites and significance was demonstrated at the $p < 0.05$ level for seniority and activation in the engagement in academic and value-based care domain [$F(1, 228) = 9.2, p = 0.003$].

6.6 Impact of Doctor Activation on the Delivery of Tangible Results

The impact of doctor activation on the delivery of tangible results for the organisation was explored through the analysis of activation scores and their correlation with involvement in and leadership of new models of care respectively at each institution and specifically the questions, *How many new model of care/quality improvement/financial optimisation/strategic planning initiatives have you been involved in at this institution in the last 18 months?* and *How many new model of care/quality improvement/financial optimisation/strategic planning initiatives have you proposed, initiated, or led at this institution in the last 18 months?*

At the USA site doctor activation was significantly correlated at the $p < 0.05$ level with involvement in institutional initiatives in the individual drivers [$F(1, 158) = 4.8, p = 0.03$] and engagement in academic and value-based care domains [$F(1, 158) = 11.5, p = < 0.001$] and overall [$F(1, 158) = 6.2, p = 0.014$]. It was similarly correlated with initiation and leadership of institutional initiatives in the individual drivers [$F(1, 158) = 7.1, p = 0.008$] and engagement in academic and value-based care domains [$F(1, 158) = 13.6, p = < 0.001$] and overall [$F(1, 158) = 6.7, p = 0.011$].

At the Australian site doctor activation was significantly correlated with involvement in institutional initiatives in the engagement in academic and value-based care domain [$F(1, 68) = 7.0, p = 0.01$] and overall [$F(1, 68) = 5.3, p = 0.025$]. It was similarly correlated with initiation and leadership of institutional initiatives in the engagement in academic and value-based care domain [$F(1, 68) = 5.4, p = 0.02$] and overall [$F(1, 68) = 4.5, p = 0.04$].

6.7 Profile of Activated Doctors Delivering Tangible Results

In order to understand the characteristics of activated doctors who are delivering tangible results for their organisation through leading change and transformation initiatives, the group of respondents with level 4 activation scores who answered >1 to the survey question of *how many new model of care/quality improvement/financial optimisation/strategic planning initiatives have you proposed, initiated, or led at this institution in the last 18 months* were statistically analysed in comparison to the rest of the respondents using a logistic regression. The total number of respondents that fit into this category is 17 (7.4% of total respondents). The logistic regression model was statistically significant for activated doctors delivering tangible results being in leadership roles $\chi^2(1) = 9.5$, $p = 0.002$ and participating in their organisation's institutional level committees $\chi^2(1) = 7.7$, $p = 0.005$. It was not significant for gender, age, years practicing medicine since graduated, number of years practicing at the institution, contractual arrangement with the institution, number of days a week practicing at the institution or participation in formal leadership training. Their overall demographic information is shown below (Table 13).

Table 13: demographic information of activated doctors delivering tangible results

Characteristic	Total N = 17 (%)
Gender	
Female	5 (29.4)
Male	12 (70.6)
Age group	
Up to 35	0
36-45	6 (35.3)
46-55	4 (23.5)
56-65	7 (41.2)
66 and over	0
Years practicing medicine since graduated	
1-10 years	4 (23.5)
11-20 years	3 (17.6)
21-30 years	6 (35.3)
31-40 years	4 (23.5)
41 years or longer	0
Level of position	
Fellow	0
Consultant/Attending	5 (29.4)
Clinical Leadership Role	12 (70.6)
Years practicing at institution	
Less than 6 months	1 (5.9)

Characteristic	Total N = 17 (%)
6-12 months	2 (11.8)
1-2 years	0
2-4 years	2 (11.8)
5-7 years	3 (17.6)
8-10 years	0
Greater than 10 years	9 (52.9)
Contractual relationship with institution	
Faculty/Health System Employed	14 (82.4)
Clinical Associate License Agreement (revenue share)	
Clinician Services Agreement/Faculty Group Practice	1 (5.9)
Private Practice Lease/Physician non-academic group practice	
Accredited Practitioner/Self employed	1 (5.9)
Government Employed	1 (5.9)
Formal Study/professional development in leadership/management	
Yes	12 (70.6)
No	5 (29.4)
Days per week working at institution	
Less than half a day	0
Half a day	1 (5.9)
1 day	1 (5.9)
2 days	0
3 days	2 (11.8)
4 days	0
5 days	7 (41.2)
Greater than 5 days	6 (35.3)
Institutional Level Committee Membership	
Yes	11 (64.7)
No	6 (35.3)

6.8 Analysis of qualitative survey results

At the conclusion of the MD-A tool, participants were optionally invited to respond to the question “My final words on Doctor Activation are...”. At both sites, the sentiment of responses that were not providing feedback on the survey was in the ratio of four negative to one positive. Some positive feedback was provided in terms of the survey itself and the concept of doctor activation. The concept of activation was generally positively received with a note that it should not be confused with burnout. Most of the feedback alluded to potential reasons why doctors at the organisation may not be activated. Following the themes identified in the semi structured interviews, the qualitative survey responses were coded in NVivo and checked by

two members of the supervisory team. The results of the qualitative survey question are presented below.

Doctor engagement and disengagement

Respondents described being engaged and activated if they feel valued and empowered to innovate. Like interview respondents, they also alluded to leadership being pivotal in driving engagement. In the case of one respondent at the Australian site, it was felt that the organisation's desire to innovate was not well connected to supporting doctors to deliver on the ground. Similarly at the USA site, one respondent described the structures being inadequate to allow doctor decision making opportunities that meaningfully affect patient care.

Predictors and detractors of activation

Respondents were not specifically asked to identify predictors of activation, but many at the USA site particularly, identified potential detractors. These are listed below:

- Not being listened to, feeling undervalued and disempowered
- Unable to navigate organisational structures and push through silos to put forward and execute ideas
- Burnout, stress and lack of support staff
- Unnecessary bureaucracy and difficult to navigate processes
- Not being able to practice at 'top of licence' and focus on quality improvement and research
- Lack of autonomy to make improvements
- Leadership not practicing the learnings from the institution's own leadership development courses.

Communication and relationships

Timely and robust communication was similarly identified as pivotal by survey (doctor) and interview (leadership) respondents. From the perspective of the doctors, there was a clear message that they would like to be consulted and involved rather than told. There was also a significant number of comments made around the relationship with and trust (or lack thereof) of senior administration. There was a theme amongst respondents of feeling that administrators place financial objectives as a higher priority than patient care, and that there was a significant disconnect between leadership and the doctors on the ground.

Incentives and strategies to improve engagement and activation

Survey respondents from the USA site echoed the concern from some leadership interview participants that the only incentives and targets at the institution were related to RVU productivity. From the perspective of the doctors, this is at odds with the academic mission of the institution and does not allow them to adequately balance research, education and

innovation with the focus being so heavily weighted towards clinical care delivery. Whilst they are not looking for financial incentives, they would like equal value and recognition placed on the other aspects of academic medicine that they joined the institution to practice. There was a similar allusion to value-based care in a suggestion from one respondent to “*make the bottom-line patient care oriented, not just financially oriented.*” Other respondents spoke to the need to engage with doctors in a more equal fashion, empower for change, create a system of shared governance, and provide more opportunities for doctor engagement between Departments.

6.9 Summary of chapter 6

This chapter provided the individual and collective results of the MD-A at the Australian and USA study sites. It highlighted the performance of each site against the scale of activation whilst revealing predictors of activation and alluding to activated doctors being more likely to deliver tangible results (e.g., quality improvement and strategic initiatives) for the organisation. The profile of highly activated doctors delivering tangible results was also explored. Finally, the qualitative survey results were presented with reference to the leadership interviews presented in chapter 4.

CHAPTER 7: DISCUSSION AND CONCLUSION

7.1 Overview of Chapter 7

This final discussion chapter brings together the context and findings of the study, to articulate the unique contribution of this research to the existing literature and potential practice. It brings together in discussion, the contextual elements provided in chapters 1, 3 and 4, with the existing literature presented in chapter 2, and the qualitative and quantitative results presented in chapters 4, 5 and 6, to distil the contributions, implications, and limitations of the study and the basis for future research.

7.2 Rationale for the study

Academic healthcare is designed to deliver excellent outcomes through the integration of clinical care, translational research, and education and training [155]. But how is it optimised for the doctors working within the system? How do we ensure doctors are activated to lead the delivery of value-based care and transform the health system for the future? How do we ensure they are not disenfranchised or burned out from working in the very system whose success relies on their leadership? Despite its importance to the delivery of value-based healthcare, patient and system outcomes, and health system transformation [1, 5, 6, 8, 10, 49-51, 58, 59], ‘clinician engagement’ remains a nebulous concept, variably defined, and difficult to usefully measure. In this context, this study explored and evaluated a new concept of doctor activation and its measurement in mature and immature Academic Health Centres (AHC) in the USA and Australia, respectively.

7.3 Research findings

The key findings from this study are six-fold. First, the MD-A – a tool designed within this study for the specific purpose of measuring doctor activation - is valid and reliable for this purpose in academic healthcare settings. Second, at the mature USA AHC study site, length of time practicing at the institution was a detractor of doctor activation. Third, at the less well-developed Australian AHC study site, predictors of doctor activation included: a larger fraction of time spent working at the institution; participation in institutional level committees (in one domain); and being formally engaged or employed by the institution. Fourth, there is a correlation between higher levels of doctor activation and tangible results being delivered for an organisation, as measured by involvement in, initiation and leadership of, institutional initiatives. Fifth, activated doctors who deliver tangible results for their organisation are significantly more likely to be in leadership roles and participating in their organisation’s key committees. And finally, the mature USA AHC study site demonstrated a lower activation score despite having a significantly higher number of leaders, doctors completing leadership training, and doctors employed on a fulltime basis at the institution completing the survey.

The Measure of Doctor Activation (MD-A) tool appears to incorporate levels of validity and reliability with capacity to measure the level of activation of doctors within the diversity of the Australian and USA academic healthcare settings. The tool has strong psychometric properties and demonstrates internal consistency in so far as higher doctor activation is correlated with the delivery of tangible results for an organisation. Activation appears to occur across four levels of: 1. resistance and agnosticism, 2. compliance and cooperation, 3. collaboration and contribution and 4. leadership and transformation. For the purposes of this study, the measure was used at the aggregate level to compare results across two AHCs but could be applied across multiple sites and be used longitudinally within the same site to measure and track activation levels over time. The tool may also be useful in both designing and evaluating initiatives to improve doctor activation within and across organisations and health systems.

At the USA study site, a longer tenure at the institution was correlated with lower activation scores. Based on the literature and qualitative interview and survey data, plausible explanations for this result are burnout, decreasing levels of motivation, and/or being worn down by bureaucratic processes or other organisational factors. Burnout particularly is a significant issue in medicine, which has likely been exacerbated by the COVID-19 pandemic, particularly in AHCs in the United States [109]. Burnout has also been found to be prevalent in AHCs where unique factors such as lack of protected time for academic pursuits contribute [13]. Whilst some studies have found a decrease in burnout with increased tenure, one study found that coping responses were not adequate in preventing burnout the longer one worked in a setting [117]. The same study showed that between 2-5 years of employment is the critical period for doctors to adjust to or accept their organisational environment [117]. This result may be consistent with the fact that in this study the USA site had a significantly higher proportion of respondents with longer tenure at the institution. Both interview participants and survey respondents noted burnout (even pre-pandemic) to be an issue. Qualitative survey respondents also alluded to alternative explanations for this result which would likely be exacerbated with tenure. These include, feeling undervalued and disempowered, dealing with unnecessary bureaucracy and difficult to navigate processes and/or not being able to practice at the 'top of their licence' and focus on quality improvement and research.

At the Australian site, three predictors of doctor activation were shown to be: a larger number of hours/days working at the institution per week; greater levels of formal engagement at the institution (e.g., employment vs accreditation); and participation in the organisation's key committees in the 'engagement in academic and value-based care' domain. These results are consistent with findings from the qualitative leadership interviews in which Australian site participants predicted that larger time commitment to the institution; being engaged via an employed, revenue share or group practice model; and ability to contribute to and influence the success of the organisation (as evidenced through key committee membership) would all

be predictors of activation. The former two of these predictors have important implications for the Australian site as personnel progress on their journey of contributing to the development as an AHC. It lends weight to their desire to continue to break away from traditional Australian private sector models of doctor engagement to create a more dedicated, present, and incentivised group of practicing academic medical doctors, through alternative forms of engagement and encouraging a greater time commitment to the institution. It also supports the committee structure that has been recently established as an effective way of engaging doctors in the pursuit of health system transformation and value-based care.

Importantly, this study showed that activated doctors are significantly more likely to deliver tangible results for their organisation, as measured by involvement in, initiation or leadership of new model of care, quality improvement, financial optimisation, and/or strategic planning initiatives. This lends further weight to the validation of the MD-A as an effective tool for measuring the level of readiness of an organisation's doctors to lead health system transformation. It also adds to existing literature on the importance of doctor engagement in improving patient and health system outcomes, through the delivery of value-based care [1, 5, 6, 8, 10, 49-51, 58, 59].

This study also uncovered two significant predictors of activated doctors who deliver tangible results for their organisation being, those in leadership roles and those participating in their organisation's key institutional level committees. This demonstrates that activation needs to be coupled with positional power to drive health system transformation and lead to the delivery of tangible results. This is consistent with literature that determines the linkage between leadership and power and, that doctors who apply principles-driven approaches to positional power become transformational leaders [156].

The final key finding from this study was a lower overall activation level of doctors at the mature USA AHC site as compared to the relatively earlier-stage Australian site. This was a somewhat unexpected result given: the significantly higher and distinctive investment of the USA site in leadership development; a more mature leadership and committee structure and delegation of responsibility to Department Chairs; and the institution's exclusive and mature model of employing doctors (largely on a fulltime basis). The latter was even more surprising noting that being employed and engaged on a more fulltime basis were predictors of activation at the Australian site. This result is likely attributable to level of maturity as AHCs of the USA and Australian sites respectively.

Whilst well designed training has been shown to improve doctor engagement [76, 89, 90], interview participants at the USA site identified some potential site-specific pitfalls. These include a lack of robust process for identifying leadership training participants, and the potential for training participants to feel more disengaged if their understanding of best

practice from the program is not actually in place within their Department or the institution. The latter was confirmed by a qualitative survey response which alluded to USA site leadership not practicing the learnings from the institution's own leadership development courses.

As described by leadership interviewees, the USA site has a mature, well-established structure for medical leadership, accountability and decision making within the organisation. Importantly, medical leaders are appropriately recognised through meaningful roles and compensation in these positions [76]. However, this structure was scrutinised in terms of being highly reliant on Department Chairs achieving the right balance between democratic and autocratic leadership, which often does not occur. Looking to the literature, it follows that the Department structure of USA AHCs often promotes siloed behaviour [144] and is perhaps not conducive to the collaboration, common voice for doctors and collective trust building that has been associated with engagement promoting structures [93, 94].

Employment represents the dominant mechanism by which doctors are engaged by AHCs in the USA and is therefore the expected norm at the USA AHC site. At the Australian site, this high level of contractual engagement is novel in the private AHC setting, and likely to only attract a certain type of academic medical doctor - described by one leadership interviewee as those wanting to 'break away' from having to operate under three separate structures for public, private and academic practice. This, coupled with the suggestion that the incentive structure tied to employment at the USA site could use some refinements (e.g., a greater focus on incentivising value over volume or enabling protected time for academic pursuits), are likely to explain the differences in results between the two sites in this area.

Table 14: Summary of research findings

Research Question	Findings
<i>How does one measure active doctor engagement?</i>	<ul style="list-style-type: none"> • Doctor engagement is a nebulous concept, ill-defined and difficult to measure across contexts. • The purpose designed, 18-item MD-A created as part of this research is a valid and reliable tool for measuring 'doctor activation' as a defined and active form of clinician engagement. • The tool measures activation on a developmental scale and has good psychometric properties with potential to be applied at the individual and aggregate level to understand results within and between systems and design, tailor and evaluate interventions.
<i>Is there a correlation between doctor activation and tangible results being delivered for the organisation?</i>	<ul style="list-style-type: none"> • Higher levels of doctor activation are positively correlated at the two sites with the delivery of tangible results for an organisation, measured by involvement in, initiation or leadership of new model of care, quality improvement, financial optimisation, and /or strategic planning initiatives.
<i>What are the individual or</i>	<ul style="list-style-type: none"> • Doctors in leadership roles and participating in their organisation's key committees are significantly more likely to be

<i>organisational predictors of tangible results arising from activated doctors?</i>	both highly activated and delivering tangible results for their organisations.	
Research Question	Findings from AUS Site	Findings from USA Site
<i>What are the individual or organisational predictors of doctor activation and what may detract from it?</i>	<ul style="list-style-type: none"> • Predictors of activation at the Australian site include: <ul style="list-style-type: none"> ○ More time per week working at the institution ○ Being formally engaged (on a revenue share, group services or employment contract) with the institution ○ Participation in institutional level committees in the ‘engagement in academic and value-based care’ domain 	<ul style="list-style-type: none"> • Longer tenure at the institution is a detractor of activation – this may be due to high levels of burnout or contributing organisational factors.
<i>What does doctor activation look like at a relatively immature and mature academic healthcare system respectively?</i>	<ul style="list-style-type: none"> • Potential for higher activation with efforts to break the norm and engage doctors in streamlined and unique ways than are otherwise experienced in Australian academic healthcare delivery. 	<ul style="list-style-type: none"> • Potential for lower activation because of burnout, rigid Departmental structure, lack of ‘walking the talk’ amongst leadership and/or lack of protected time for or incentivisation of non-clinical activity.

7.4 Implications

The 18-item MD-A is a potentially useful tool for measuring doctor activation at individual and institutional levels. Because of its strong psychometric properties and developmental nature, the tool could also be used at the individual doctor level to identify potential future leaders within the organisation and understand individual activation levels to support tailored development and retention strategies. For example, those at the earliest stage of activation could be buddied with a more experienced and activated mentor to assist with navigating the system and advocating for change. Those who were highly activated could be harnessed, supported, and empowered in decision making, leadership and mentoring roles. For the tool to be used at the identified, individual level however, safeguards would need to be put in place to ensure it was not used to deleterious ends, such as performance management or discriminatory recruitment. It would therefore be recommended that if the tool was used on an identifiable basis, the individual results were only accessible to an area of the organisation independent of line management such as Human Resources (HR) or the leadership of the Faculty Practice Plan (FPP), or analysed externally, to then provide filtered, useful information

to clinical leaders. As the tool measures activation in accordance with a four-level developmental scale, potential generic goals at both the individual and institutional level are presented below (Figure 9).

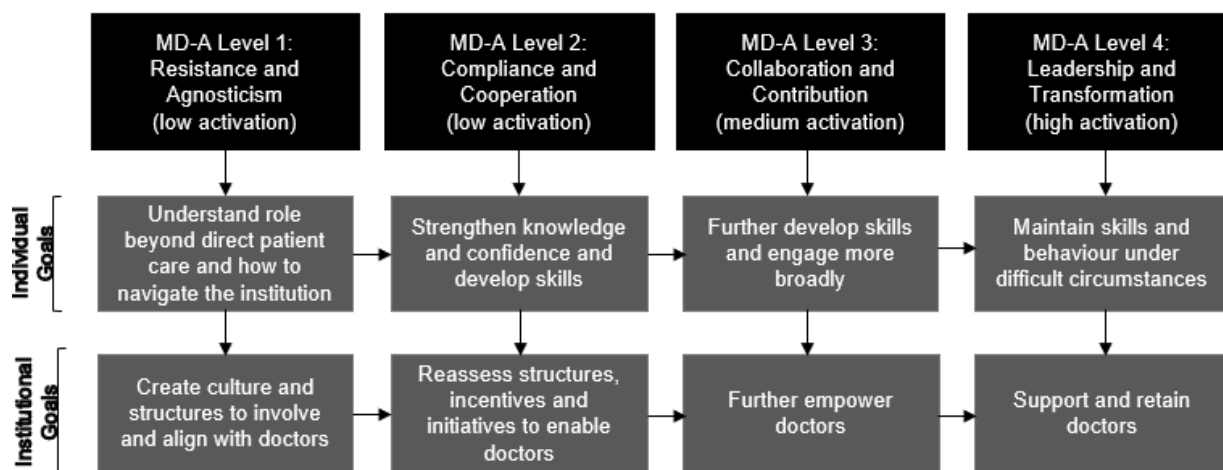


Figure 9: Goals for progression between the four levels of doctor activation

At the USA site, an overall activation score of level 2 (compliance and cooperation) was achieved. Drawing on the literature, the qualitative results of this study and the model above (Figure 9), implications and site-specific recommendations to progress towards level 3 are provided below (Figure 10). Assuming the burnout of doctors potentially inherent at this site due to the COVID-19 pandemic do not fully explain the results, there is room for improvement in terms of doctor activation. In line with the literature, this site could focus on the re-creation of a work environment that maximises doctor satisfaction, collaboration, and their ability to contribute to the organisation [117]. This could be achieved through realigning incentives to reward value over volume and providing protected time for academic pursuits [13]. It would additionally be worth implementing the graduated, experiential development and support structure proposed by one of the leadership interviewees as a way of activating current doctors and ensuring a sustainable flow of qualified, well-prepared clinical leaders into the future.

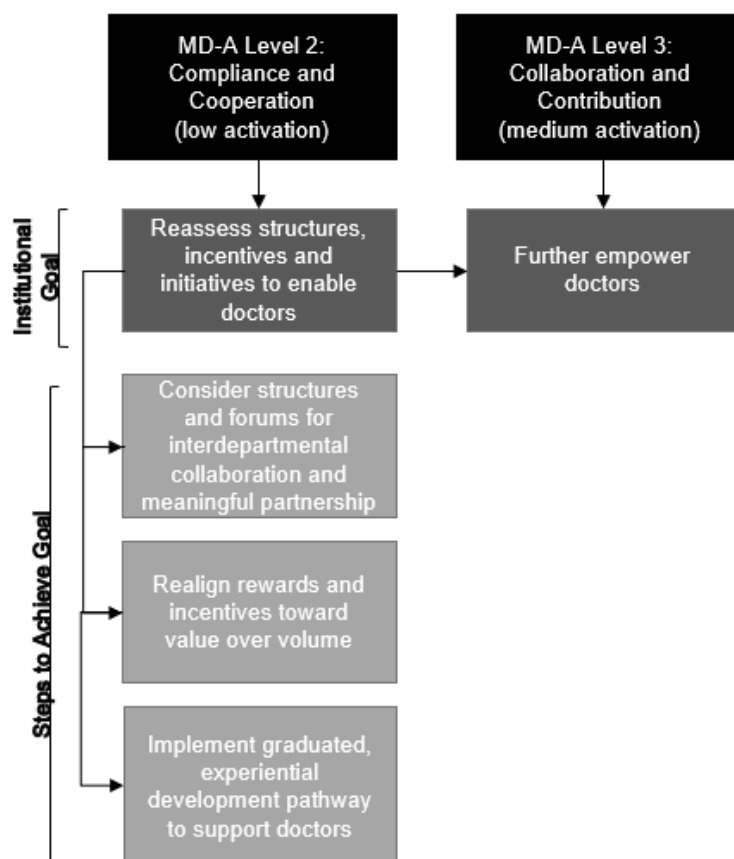


Figure 10: Steps to achieve increased doctor activation at USA site

At the Australian site, an overall activation score of level 3 (collaboration and contribution) was achieved. In learning from the mature USA site and the results of this study, it will be important as the Australian site progresses, to be mindful of the potential burnout and deactivation that is possible in doctors operating in mature AHC structures. It is possible that the respondents to the Australian site survey were a more engaged group than the general population of doctors, and as such a remeasure with the refined (shorter) tool and incentives to achieve a higher response rate should occur in approximately 12 months from the first measure, to confirm these results or determine a more accurate baseline. Given its youthful stage as an AHC, the Australian site appears to be on a positive journey towards creating an environment conducive to doctor activation. The recommendations provided for this site, therefore draw on the literature and results of the qualitative elements of this study to suggest a path of further progression on the institution's journey towards level 4 activation (Figure 11).

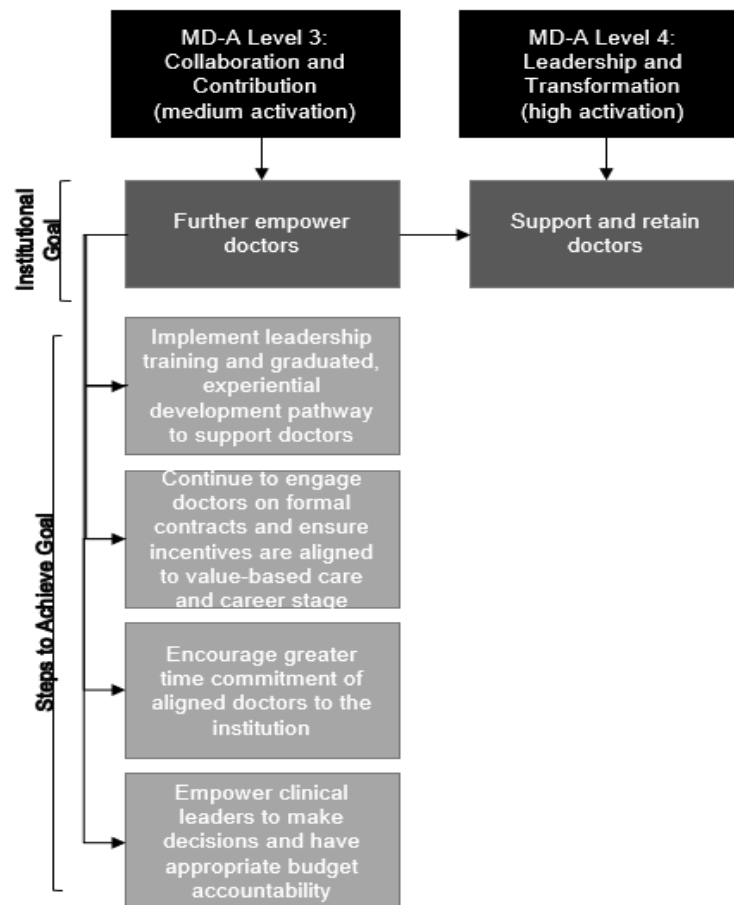


Figure 11: Steps to achieve increased doctor activation at the Australian site

7.5 Contributions

This study contributes a novel, valid and reliable tool for the measurement of doctor activation as a defined form of active doctor engagement. The MD-A allows measurement in accordance with a developmental scale to allow organisations to potentially initiate and evaluate interventions at the individual and aggregate levels to improve doctor activation scores with the view to improving patient outcomes and overall performance. Additionally, the study contributes to the literature on potential contributors to and detractors from doctor engagement in the context of mature and immature AHCs. It also adds to the literature demonstrating the benefits of doctor engagement or activation in the delivery of tangible results in the form of involvement in, initiation or leadership of new model of care, quality improvement, financial optimisation, and /or strategic planning initiatives. And finally, it contributes a new finding to the literature that activated doctors are more likely to deliver tangible results for the organisation when they hold positional power (through a leadership position or membership of an institutional level committee).

7.6 Strengths and limitations

The main limitations of this study relate to the relatively small sample sizes of survey and leadership interview participants, and the low response rate at both sites. Whilst a large enough sample for the purposes of validation was achieved, determining the cut scores for doctor activation levels utilising only two study sites may not provide a realistic measure and should be assessed across several other sites in future research. Further, it was not possible to determine the representativeness of the samples at each site given the unavailability of data. Nevertheless, the methods comprehensively followed a rigorous process in survey development and validation. In addition, the fact that survey respondents were from sites in two countries and represented multiple specialties lends added weight to the findings – both universal and site-specific – of the study.

Anonymity was preserved for the purposes of this study and to increase response rates to allow an adequate sample for validation and analysis. It is acknowledged however, that the proposed tool may be valuable in certain contexts to measure activation at the individual level where anonymity would not be useful. Such instances may include identifying potential candidates for leadership development and support and targeting individual strategies to improve or maintain levels of activation. Additionally, whilst a relatively modest panel of experts was utilised for development and face and content validity in this study, a larger panel could be utilised in further research and as the tool is refined, in an effort to increase the level of content validity and applicability across contexts [157]. Although some methods were applied to increase participation rate (involving local champions, selling the potential benefits of the survey in the cover email, producing a relatively short survey) some form of incentive could have also been utilised [119-122, 158]. To further raise participation, linking the survey to routine regular practice such as allowing time at the end of Department/Discipline meetings could also be explored.

The interviewer's knowledge and experience in the hospital system gave unique insights into results, and credibility among participants as a researcher who was knowledgeable and understanding of the nuances. Whilst it would have been ideal to have both larger and equal numbers of executive members in similar corresponding roles interviewed from each site, availability of some selected executives for interview within the timeframe was a limiting factor.

A further limitation relates to the identified correlation at the USA site between lower levels of activation and longer tenure at the institution. Whilst the literature and qualitative data alluded to potential burnout, this was not specifically measured as part of the MD-A. Given the high prevalence of burnout in doctors [110], it would be worth considering including a measurement of burnout as part of or alongside the MD-A, to determine whether it is a contributor to lower activation.

7.7 Future research

This study creates a pathway for future research on doctor activation and further use and refinement of the MD-A. The candidate and supervisory team are committed to administering the validated tool to at least four more sites (two in the USA and two in Australia) to further refine and validate the tool across additional country specific settings. The tool could then be tested for broad applicability across different healthcare settings around the world. Once further validated and refined, the MD-A could be utilised to measure interventions within and between sites and determine whether there is a link between doctor activation and successful health system outcome improvement and transformation.

7.8 Conclusion

The 18 item MD-A developed in this study is a novel, fit for purpose, valid, and reliable tool for measuring doctor activation on a developmental scale. Doctor activation in a developing Australian AHC was associated with increased formal mechanisms of engagement and time commitment to the institution. At a mature USA AHC, lower levels of activation were associated with longer tenure. Overall, it was demonstrated that higher doctor activation leads to tangible results being delivered for an organisation, as measured by involvement in, initiation and leadership of, institutional initiatives. Additional studies are warranted to further validate and refine the MD-A.

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APPENDIX A – SEMI STRUCTURED INTERVIEW SCHEDULES

USA site semi-structured interview schedule

- Q1: Please introduce yourself, your role, the reasons that led you to work here, and your background including your previous professional experiences?
- Q2: How would you define physician engagement? What would you say are the core elements/domains of it?

Review Proposed Domains:

- A. *Individual drivers and performance*
 - B. *Work absorption and satisfaction*
 - C. *Work efficiency and ability to leverage resources*
 - D. *Organisational dedication/commitment*
 - E. *Engagement in team/value-based patient care*
 - F. *Healthcare system understanding and navigation*
- Q3: Can you describe the level of physician engagement within your organisation? Has it ever been formally measured in any way? If so, what were the results?
- Q4: What does physician engagement look like at its best and worst (disengagement) in your organisation? What are the key differences between an engaged and disengaged physician? *Participants will be asked to provide illustrative examples.*
- Q5: If we were to define doctor activation as “*The ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient centered care.*”:
 - A. what do you think would be the predicting factors of a physician being highly activated?
 - B. what do you think might detract from a physician’s likelihood of being activated?
- Q6: What structures, support and initiatives does your organisation have in place to foster/improve physician engagement? Have you been able to measure the success/formally evaluate any of these?
- Q7: How is physician involvement structured/governed in your organisation? What positions and committees/forums are involved? Are physicians empowered to make decisions at these meetings/forums? Is administrative management present/participatory in these forums?
- Q8: What is attendance and participation like at these meetings/forums? How would you describe the productivity/action-orientation of these forums?
- Q9: What are the key communication mechanisms between physicians and management in your organisation? Do you believe they are effective?
- Q10: Can you describe the relationship between senior physicians and senior management in your organisation?
- Q11: What is the expectation in terms of physician participation in research and teaching in your organisation? Is there a minimum expected? Who determines this?

- Q12: What rewards or incentives (if any) are in place to encourage physician engagement in your organisation? Are they effective? If ineffective or non-existent, what (if anything) do you think would be effective?
- Q13: What formal engagement arrangements (contract options) exist with physicians in your organisation? Which of these do you believe is most conducive to engagement? Which is least conducive?
- Q14: Which areas of running your organisation do you think optimal physician engagement would most benefit? (*e.g., strategic planning, quality and safety, financial performance, growth, innovation, model of care advancement, capital planning and design, general decision making, operations etc.*)
- Q15: Which areas from the previous question do you think physicians at your organisation are most enthusiastic about/likely to engage with?
- Q16: Review draft survey (if time permits)

Australian site semi-structured interview schedule

- Q1: Please introduce yourself, your role, the reasons that led you to work here, and your background including your previous professional experiences?
- Q2: How would you define clinician engagement? What would you say are the core elements/domains of it?

Review Proposed Domains:

G. Individual drivers and performance

H. Work absorption and satisfaction

I. Work efficiency and ability to leverage resources

J. Organisational dedication/commitment

K. Engagement in team/value-based patient care

L. Healthcare system understanding and navigation

- Q3: Can you describe the level of clinician engagement within your organisation? Has it ever been formally measured in any way? If so, what were the results?
- Q4: What does clinician engagement look like at its best and worst (disengagement) in your organisation? What are the key differences between an engaged and disengaged clinician? *Participants will be asked to provide illustrative examples.*
- Q5: If we were to define doctor activation as “*The ability and motivation of medical doctors in regularly and actively contributing to sustaining or improving the delivery of high value, patient centered care.*”:
 - C. what do you think would be the predicting factors of a clinician being highly activated?
 - D. what do you think might detract from a clinician’s likelihood of being activated?
- Q6: What structures, support and initiatives does your organisation have in place to foster/improve clinician engagement? Have you been able to measure the success/formally evaluate any of these?

- Q7: How is clinician involvement structured/governed in your organisation? What positions and committees/forums are involved? Are clinicians empowered to make decisions at these meetings/forums? Is administrative management present/participatory in these forums?
- Q8: What is attendance and participation like at these meetings/forums? How would you describe the productivity/action-orientation of these forums?
- Q9: What are the key communication mechanisms between clinicians and management in your organisation? Do you believe they are effective?
- Q10: Can you describe the relationship between senior clinicians and senior management in your organisation?
- Q11: What is the expectation in terms of clinician participation in research and teaching in your organisation? Is there a minimum expected? Who determines this?
- Q12: What rewards or incentives (if any) are in place to encourage clinician engagement in your organisation? Are they effective? If ineffective or non-existent, what (if anything) do you think would be effective?
- Q13: What formal engagement arrangements (contract options) exist with clinicians in your organisation? Which of these do you believe is most conducive to engagement? Which is least conducive?
- Q14: Which areas of running your organisation do you think optimal clinician engagement would most benefit? (*e.g., strategic planning, quality and safety, financial performance, growth, innovation, model of care advancement, capital planning and design, general decision making, operations etc.*)
- Q15: Which areas from the previous question do you think clinicians at your organisation are most enthusiastic about/likely to engage with?
- Q16: Review draft survey (if time permits)

APPENDIX B – ORIGINAL MD-A ITEM MAPPING

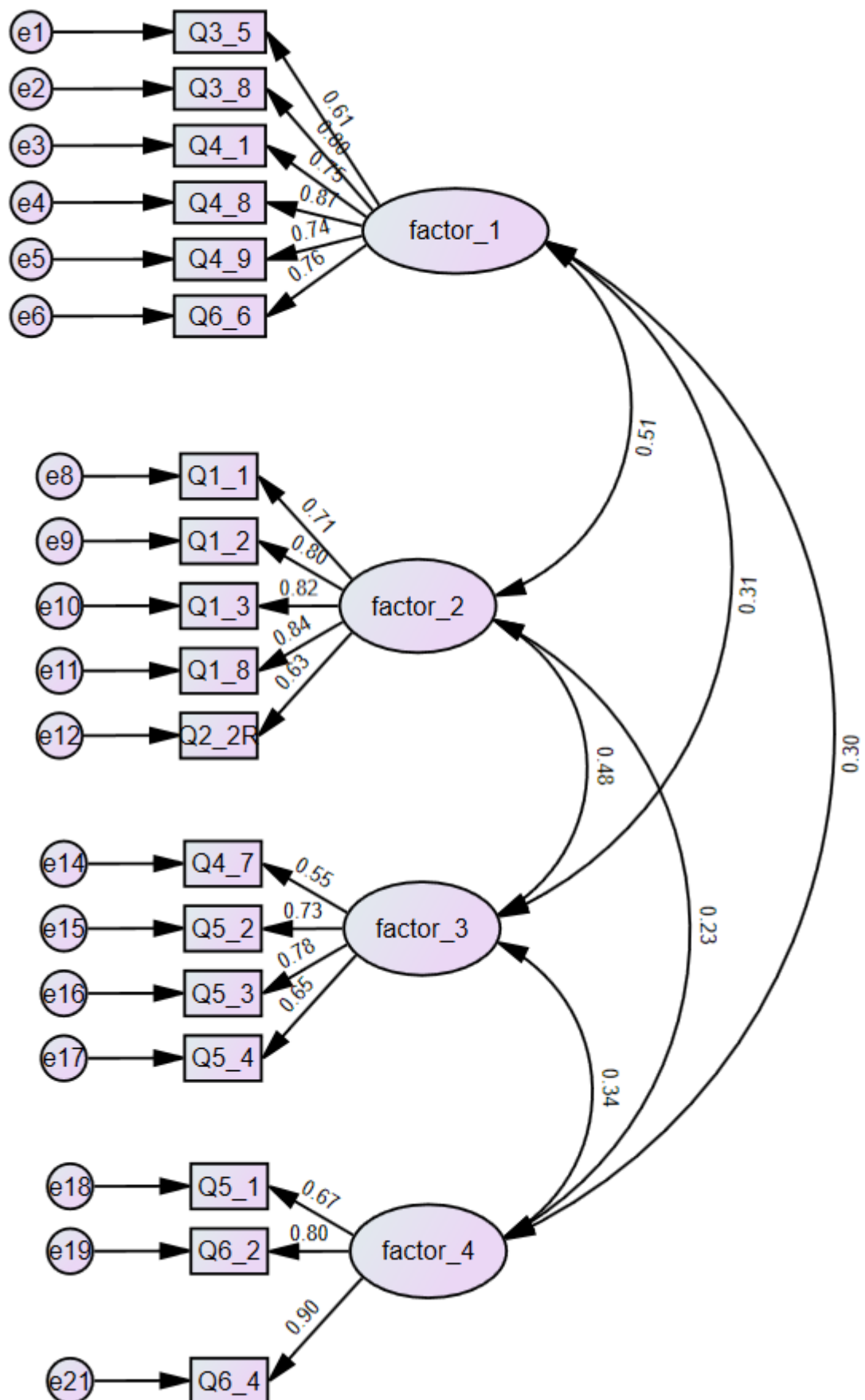
Domain	Items	Reference
Individual drivers and performance	My personal values align with my day-to-day work	UWES
	I find the work that I do full of meaning and purpose	UWES
	When I get up in the morning, I look forward to going to work	UWES
	I feel my contributions are meaningful toward advancing the mission of the institution	SCORE
	I feel a sense of personal responsibility for delivering high quality care and outcomes	NEW
	I actively incorporate leadership principles into my daily work	NEW
	I have opportunities for creativity, independent thought and action in relation to improved healthcare delivery	SCORE
	I am able to stay connected to my personal goals and purpose at work	FACE/CONTENT VALIDITY
Work absorption and satisfaction	I have the scope, authority, and opportunity to succeed at work	MES/Human Synergistics
	I feel fully engaged and get carried away when I'm working	UWES/MES
	I trust and get along with the people I work with	MES
	I trust and feel supported in my work by health system leadership	BPA
	I would rather be incentivised for quality of care over volume of care	NEW
	I am able to contribute to improving the way things work in the institution	BPA
	I am provided with effective professional development and leadership opportunities	BPA
Work efficiency and ability to leverage resources	I have the autonomy to adjust my work schedule and structure to match my optimal work style	SCORE
	My institution allows doctors to work in an efficient manner	NEW
	If I want to expand my scope of work, the necessary resources are readily available	SAQ
	I have as much access to data and information technology service as I desire	NEW
	My institution recruits high quality staff	BPA
	My institution attracts/recruits high quality doctors	FACE/CONTENT VALIDITY
	My hospital/health system management regularly seeks input from doctors to improve care delivery	SAQ & FACE/CONTENT VALIDITY
	My hospital/health system management implements changes based on input from doctors to improve care delivery	SAQ & FACE/CONTENT VALIDITY

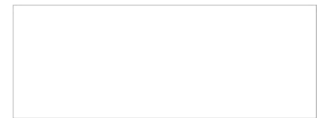
Domain	Items	Reference
Organisational dedication/commitment	My institution has a strong sense of purpose and strategic direction	BPA
	My professional values align with those of the organisation	MES
	I would intervene with a colleague who was not demonstrating our institution's values	BPA
	I would feel supported by my institution in intervening with a colleague who was not demonstrating our values	FACE/CONTENT VALIDITY
	I regularly express pride in or promote my institution	NEW
	I feel a shared obligation to seek opportunities to serve my institution and colleagues	NEW
	Allegiance to my colleagues is sometimes more important than commitment to my patients	MES
	My institution allows people to bring up problems and tough issues	NEW
	I actively mentor junior staff and seek and foster talent	NEW
Engagement in team/value-based patient care	I have a robust understanding of how the health system values and reimburses the services provided by my specialty area	NEW
	I routinely seek opportunities to foster patient engagement, autonomy and shared decision making	NEW
	I routinely seek opportunities for interdisciplinary and multidisciplinary patient centred care	NEW
	I actively engage in evidence-based practice and seek practice-based learning opportunities	NEW
	Engaging in clinical and translational research and applying discoveries to clinical care improves outcomes	NEW
Healthcare system understanding and navigation	The decision-making process in my work setting is clear to me	SCORE
	I understand different models of healthcare delivery and their relative strengths and weaknesses	NEW
	I understand how my health system balances quality, cost and equitable access in delivering care	NEW
	I understand how healthcare is valued, funded and reimbursed	NEW
	I am comfortable and capable of initiating quality improvement to address patient care problems at my institution	PAM
	My institution has a practical and effective quality improvement infrastructure	SCORE

APPENDIX C – FACTOR LOADINGS FOR EFA (ALL ITEMS)

	Organisational Drivers	Individual Drivers	Engagement in Academic and Value-Based Care	Health System Understanding
Q1_1		.654		
Q1_2		.748		
Q1_3		.773		
Q1_4	.529	.679	.568	
Q1_6			.596	
Q1_7	.648	.782		
Q1_5				
Q1_8	.513	.869		
Q2_1	.667	.758		
Q2_2		.622		
Q2_3	.521	.552		
Q2_4	.823	.612		
Q2_5				
Q2_6	.743	.617		
Q2_7	.605	.539		
Q3_1		.503		
Q3_2	.719	.649		
Q3_3	.697	.571		
Q3_4	.543			
Q3_5	.651			
Q3_6	.519			
Q3_7	.837	.501		
Q3_8	.851	.553		
Q4_1	.761			
Q4_2	.780	.541		
Q4_3				
Q4_4	.666		.535	
Q4_5			.619	
Q4_6				
Q4_7			.571	
Q4_8	.829			
Q4_9	.696			
Q5_1				.729
Q5_2			.645	
Q5_3			.665	
Q5_4			.630	
Q5_5				
Q6_1	.722			.533
Q6_2				.791
Q6_3	.550			.824
Q6_4				.816
Q6_5				.526
Q6_6	.751			

APPENDIX D – FINAL MD-A MODEL FIT





19/08/2021

Dear Professor Braithwaite,

Reference No: 520211031831761

Project ID: 10318

Title: Measuring Clinician Activation in Academic Medicine in Australia and the USA

Thank you for submitting the above application for ethical review. The Medicine & Health Sciences Subcommittee has considered your application.

I am pleased to advise that ethical approval has been granted for this project to be conducted by Professor Braithwaite, and other personnel: Dr Janet Long, Dr Louise Ellis, Dr Zeyad Mahmoud, Dr Chancellor Gray, Professor Hari Parvataneni and Ms Natalie Sequeira .

This research meets the requirements set out in the National Statement on Ethical Conduct in Human Research 2007, (updated July 2018).

Standard Conditions of Approval:

1. Continuing compliance with the requirements of the National Statement, available from the following website:
<https://nhmrc.gov.au/about-us/publications/national-statement-ethical-conduct-human-research-2007-updated-2018>.

2. This approval is valid for five (5) years, subject to the submission of annual reports. Please submit your reports on the anniversary of the approval for this protocol - 19 August (annually). You will be sent an automatic reminder email one week from the due date to remind you of your reporting responsibilities. Please find following the date range of the reporting periods:

Annual report 1 - FROM: 19/08/2021 TO: 19/08/2022

Annual report 2 - FROM: 19/08/2022 TO: 19/08/2023

Annual report 3 - FROM: 19/08/2023 TO: 19/08/2024

Annual report 4 - FROM: 19/08/2024 TO: 19/08/2025

Final report 5 - FROM: 19/08/2025 TO: 19/08/2026

3. All adverse events, including unforeseen events, which might affect the continued ethical acceptability of the project, must be reported to the subcommittee within 72 hours.

4. All proposed changes to the project and associated documents must be submitted to the subcommittee for review and approval before implementation. Changes can be made via the [Human Research Ethics Management System](#).

The HREC Terms of Reference and Standard Operating Procedures are available from the Research Services website:
<https://www.mq.edu.au/research/ethics-integrity-and-policies/ethics/human-ethics>.

It is the responsibility of the Chief Investigator to retain a copy of all documentation related to this project and to forward a copy of this approval letter to all personnel listed on the project.

Should you have any queries regarding your project, please contact the [Faculty Ethics Officer](#).

The Medicine & Health Sciences Subcommittee wishes you every success in your research.

Yours sincerely,

Dr Mark Butlin

Chair, Medicine & Health Sciences Subcommittee