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Going with the flow

A systems approach to how an Academic Health
Science Centre creates value through collaboration



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The Advanced Institute of Management Research (AIM) develops UK-based world-class management research. AIM seeks to identify ways to enhance the competitiveness of the UK economy and its infrastructure through research into management and organisational performance in both the private and public sectors.

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- Engage with practitioners and other users of research within and beyond the UK as co-producers of knowledge about management

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Current AIM research projects focus on:

UK productivity and performance for the 21st century.

How can UK policymakers evaluate and address concerns surrounding the UK's performance in relation to other countries?

National productivity has been the concern of economists, government policymakers, and corporate decision-makers for some time. Further research by scholars from a range of disciplines is bringing new voices to the debates about how the productivity gap can be measured, and what the UK can do to improve the effectiveness of UK industry and its supporting public services.

Sustaining innovation to achieve competitive advantage and high quality public services.

How can UK managers capture the benefits of innovation while meeting other demands of a competitive and social environment?

Innovation is a key source of competitive advantage and public value through new strategies, products, services and organisational processes. The UK has outstanding exemplars of innovative private and public sector organisations and is investing significantly in its science and skills base to underpin future innovative capacity.

Adapting promising practices to enhance performance across varied organisational contexts.

How can UK managers disseminate their experience whilst learning from others?

Improved management practices are identified as important for enhancing productivity and performance. The main focus is on how evidence behind good or promising practices can be systematically assessed, creatively adapted, successfully implemented and knowledge diffused to other organisations that will benefit.

This briefing looks at the case of Cambridge University Health Partners, the management organisation of the Cambridge Academic Health Science Centre (AHSC). An AHSC is a partnership between one or more universities and healthcare providers focusing on the tripartite mission of research, clinical care and teaching. AHSCs work on the principle that the collaboration between university and healthcare providers creates greater value than their operating alone. Our briefing reports on the nature and characteristic of one such partnership, and how such outcomes are achieved collaboratively.

This briefing identifies the value of partnerships in an AHSC, the scope of an AHSC management organisation (AHSCMO), measures that can be taken to improve AHSC performance through a systems approach, as well as interventions that can improve the collaboration between the different parties.

To do this we used a value creating systems approach. The approach looks at value creation within the system, managing and supporting value creating activities and any barriers that exist, as well as how to measure performance. We apply systems theory to the AHSC, which involves looking at the whole as well as the parts, considering the interactions within the system, emergent outcomes, and in particular the way that individuals interact to effect change and achieve outputs.

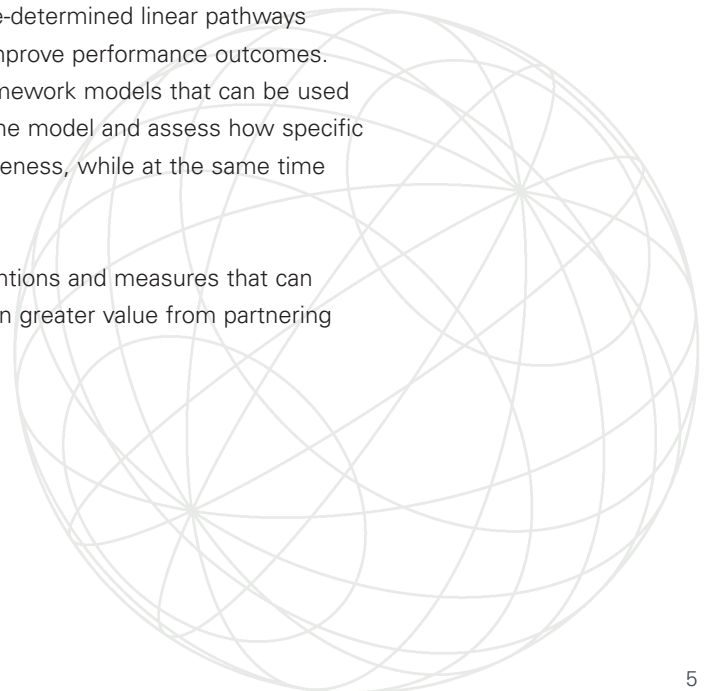
The research identified the characteristics of the AHSC system as well as numerous challenges to and enablers of collaboration. Importantly the findings reveal that it is the linkages between the care, teaching, research, tripartite mission that are crucial to the successful creation of value. It is in these interactive flows that collaboration maximises value, achieving outcomes over and above what is possible when the three elements are operating alone.

As such we propose that the role of the AHSCMO is to focus on and make sure that these flows are optimal. This is the outcome that the AHSCMO should be assessed on – as opposed to the underlying but separate missions: research, teaching and care.

It is also important not to attempt to impose pre-determined linear pathways upon the system in order to try to manage or improve performance outcomes. Instead the briefing offers a number of flow framework models that can be used to map current interactions and activities onto the model and assess how specific interventions could increase the system effectiveness, while at the same time monitoring consequences elsewhere.

Finally, we also offer three categories of interventions and measures that can be applied to improve collaboration and so obtain greater value from partnering within the system.

An AHSC is a partnership between one or more universities and healthcare providers focusing on the tripartite mission of research, clinical care and teaching.



Academic Health Science Centres (AHSC) explained

An AHSC is a partnership between one or more universities and healthcare providers focusing on the tripartite mission of research, clinical care and teaching. AHSCs work on the principle that the collaboration between university and healthcare providers would enhance all missions in such a way that the whole is greater than the sum of its parts. In 2005, the top sixteen ranked hospitals in the US were all AHSCs. AHSCs in the UK were borne out of Professor Lord Darzi's report in 2007, as part of his review of healthcare in London. As the report stated:

London needs to explore the model of Academic Health Science Centres being followed by other large cities if it wants to be at the cutting-edge of research and clinical excellence... A new form of university/hospital partnership is needed to maintain the UK's academic institutions at the forefront of the global marketplace where they compete for grants, recognition and staff.

It is suggested that AHSCs have the potential to lead 'the transformation of medicine through the development of a discovery-care continuum'...

Since then, five partnerships in the UK have been designated as an AHSC and all but one, as of 2011, have formalised the management of their AHSC through the creation of an entity – the AHSC Management Organisation (AHSCMO). Despite some differences of detail and emphasis, these broadly follow a single model, being not-for-profits with an intermediary role.

Typically the AHSCMO's mission is to formalise and strengthen the collaboration between academic institution(s) and its principal NHS partners through the promotion of excellence in the tripartite mission of health care, education and research, to promote innovation and to communicate positive economic impact.

The aim is to improve the following outcomes for both sectors:

- improved patient care and population health
- excellence in health research and education
- more rapid translation of research into new products or processes

It is suggested that AHSCs have the potential to lead 'the transformation of medicine through the development of a discovery-care continuum' (p.950, Dzau et. al. 2010¹) and the AHSC model is well established in the United States, Canada, Singapore, Sweden and the Netherlands. The research literature relating to AHSCs is mostly North American and is focused on institutional issues, such structure and governance, or on aspects of the individual missions. It is also mostly atheoretical. Our approach is novel in that we bring systems theory to bear on this organisational category.

This executive briefing summarises the following:

- a articulating the *value* of partnerships in an AHSC and the scope of an AHSC management organisation (AHSCMO)
- b recommending how to improve on the performance of the AHSC through a systems approach

Critically, what do individual institutions have to gain through the collaboration afforded by being part of an AHSC, that they would otherwise not be able to achieve?

¹ Dzau, V.J., Ackerly, D.C., Sutton-Wallace, P., Merson, M.H., Williams, R.S., Krishnan, K.R., et al (2010). The role of academic health science systems in the transformation of medicine, *Lancet* 375:949-953.

methodology and a value-based systems approach

This executive briefing draws on the findings from a project involving Cambridge University Health Partners, an AHSCMO set up to manage the Cambridge AHSC. This comprises the University of Cambridge and its three principal National Health Service affiliates. The project used a value-based systems approach to analyse the AHSC. A value-based approach focuses on value that is co-created between partners of a system to discover:

- the value to be created by participants in the system
- the *key value transformations* within the system
- an understanding of where barriers may exist in collaboration
- an understanding of how the system could be managed, and supported to create the value
- how performance could be assessed

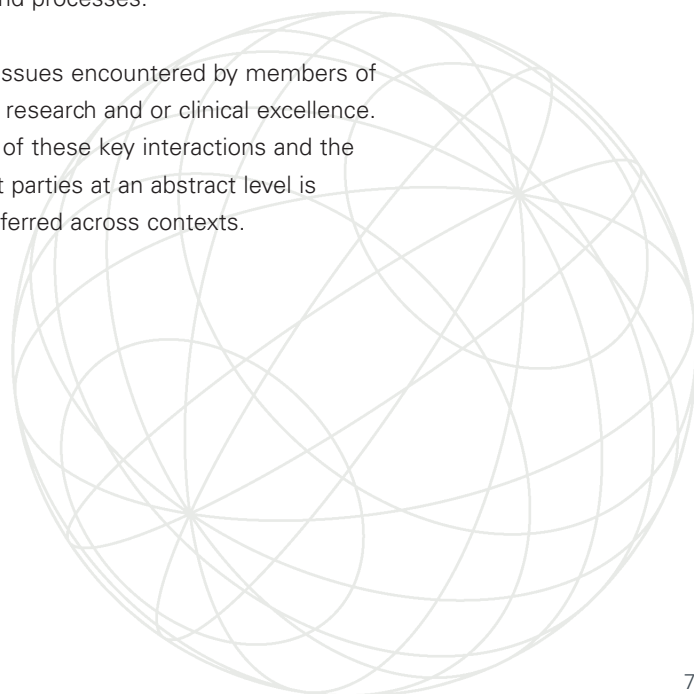
Concurrently, we also employ a systems approach towards our analysis, which allows us to understand:

- the whole as well as the parts
- the dynamism of the whole and how various decisions could impact on different outcomes
- how various elements interact with one another
- how core transformations are effected by various agents in a system
- how agents interact within a system to achieve outputs and emergent outcomes
- inputs, outputs and the role of interventions to achieve various outcomes
- performance evaluation based on the value co-created by the whole, rather than the parts

Our working hypothesis is that the overall performance of this system depends on the ways in which individual clinicians/researchers/educators are able to work across organisational boundaries, both through collaboration at an individual level and through their ability to engage in organisational politics and processes.

This briefing describes the key interactions and issues encountered by members of the tripartite mission in the pursuit of academic, research and or clinical excellence. The documentation, understanding and analysis of these key interactions and the nature of value co-creation between the relevant parties at an abstract level is critical as it will allow the knowledge to be transferred across contexts.

This briefing describes the key interactions and issues encountered by members of the tripartite mission in the pursuit of academic, research and or clinical excellence.



key findings

Distinctive features of the Cambridge AHSC

The AHSC analysed is a multi-organisational collaborative system with a number of distinct features. This is true of the system as whole and the individuals within it.

The system

The system was designated as an AHSC by the UK government in 2009. However, the AHSC system pre-existed and would continue to exist and continue to achieve collaborative outcomes with or without the AHSC label or the intervention of the AHSCMO as a vehicle for formal governance.

Thus, any attempted management of the system in an attempt to improve the system's effectiveness must be careful not to disrupt the existing system's achievements, which are based upon long-standing dynamics. The governance body has to consider how it remains viable, and at the same time can improve on the AHSC rather than reducing its effectiveness.



The AHSC analysed is a multi-organisational collaborative system with a number of distinct features.

The system outcomes are currently achieved by many autonomous individuals. Putting in place mechanisms that are deterministic, rigid, or too controlling, may compromise the creativity and entrepreneurialism of individuals, even though the same mechanisms may spur others to collaborate. As a result, maintaining system stability and sustainability to consistently deliver good outcomes is a challenge.

On a daily basis individuals will assume and cope with multiple roles and therefore identities.

Since the AHSC has a tripartite mission, it is important to take care not to compromise any of the missions when attempting to improve the whole, or at least not to do so without the specific knowledge and consent of the partner organisations.

As a complex collaborative system, system outcomes and behaviours cannot be deterministically designed in a reductionistic manner – where a problem is broken down into its component parts to be optimised separately before piecing them together again. Reducing the system into a sub-system (predesigning the research-to-care route, for example) may lead to unintended consequences elsewhere.

The system exhibits the complex emergent property of a *knowledge community*. Being a member of a knowledge community will have an impact on the behaviours of individuals within the system, particularly in motivating individuals to achieve excellence

Individuals in the system

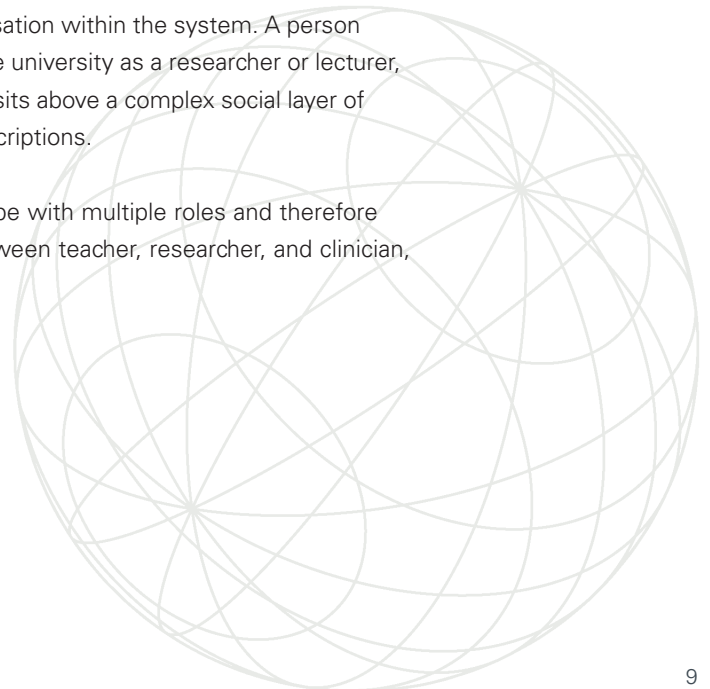
The individuals within the system also have certain characteristics.

There are, for example, various degrees of autonomy amongst individuals (agents), with some individuals, such as academics, being much more autonomous than others. This implies that governance, policies and organisation processes may have different degrees of influence on different individuals.

Autonomous agents within the system have shown some extraordinary entrepreneurial creativity in working across boundaries. This creativity is sometimes *because* of these boundaries and sometimes *in spite* of the boundaries.

Many individuals work for more than one organisation within the system. A person may work for the hospital as clinician, and for the university as a researcher or lecturer, for example. The organisational layer, therefore, sits above a complex social layer of mixed incentives, motivations, skills and job descriptions.

On a daily basis, individuals will assume and cope with multiple roles and therefore identities. For example, they may negotiate between teacher, researcher, and clinician, all within the day.



Individual (micro-level) collaboration in the system: challenges and enablers

Challenges to Collaboration

There are several challenges associated in achieving the linkages necessary for collaboration. These include:

- incentives of parties not being well-aligned
- under-investment in interfaces
- inter-organisational boundaries impede collaboration
- outcomes that are uncertain and attempts to collaborate not always productive
- collaboration requiring trust and time with risky payback
- cumbersome inter-organisational processes
- a lack of physical spaces to promote serendipity, opportunities and collaborative culture
- collaboration being a multi-layered (e.g. warming to each another, relationship building, actual work scoping, sharing data, writing grants etc.), requiring different skills and capabilities in each layer
- and collaboration being unstructured

Enablers of collaboration

Despite these challenges, respondents have also reported times when collaboration was enabled by an individual. Enablers of collaboration include:

- parties focusing on opportunities (e.g. 'could see what was possible')
- providing Rewards and Incentives as motivators
- understanding characteristics of people who are more inclined towards collaboration
- individuals with mixed identities and mixed contracts who can see different perspectives and recognise challenges spur collaboration
- ambition (that spurs collaboration)
- starting with a smaller role to get into the culture of collaboration
- learning the system; developing familiarity with the system and the language of others
- developing a social network before collaborating
- having a strong vision and conviction for a particular research
- co-location of research institute with clinicians promotes serendipity and relationship building
- having a champion, as the initiator or catalyst for collaboration
- being 'problem' or 'needs' focused
- discovering complementarity between research ideas and problems

the AHSC flow framework as the value of partnership

Our findings reveal that the concept of knowledge flows is fundamentally important in creating value through collaboration. Knowledge flows focus on the practices that result in the acquisition of knowledge, and encouraging such flows encourages practices to promote, motivate, encourage, and nurture the way 'knowing' is achieved. It privileges the relationship between the knowledge and the knower through *dynamic practice*, rather than removing the knower by trying to capture or distribute knowledge. Focusing on knowledge flows, therefore, means enabling the development of learning communities. The value of partnerships lies in the practice linkages between the three functional missions and the emergence of knowledge flows between them.

Thus, for an AHSC to be viable, it has to focus on enabling research, teaching and care *flows* as a macro-level property of the system i.e. the *linkages* between the tripartite missions and the performance of emergent knowledge flows *are in themselves the outcome of which the AHSCMO should be assessed on*. In other words, we propose that it is not research, teaching, or care, that is the focus of the AHSCMO, but research-informed-care practices (and vice versa), teaching-informed-care practices (and vice versa) and research-informed-teaching practices (and vice versa).

By focusing on, and enabling such flows, we recommend that AHSCMO takes ownership of the practices embedded in the linkages, creating a complementary effect of the organisation's role to that of its partner organisations.

Interactions between individuals within and across boundaries are the unit of analysis to catalyse micro level collaboration to achieve macro level flows. However, partner organisations and the AHSCMO serve a crucial role of governing, incentivising and intervening in the environment within which such individuals operate.

The AHSC Knowledge Flow Framework: articulating the value of the AHSC partnership

Care Flows

Care Flows emerge from how research or teaching informs care. These flows could emerge from more direct interactions from research to care (or teaching to care), or through indirect interactions i.e. research informing teaching, which then informs care. For example, academics could be conveying the latest research to their PhD students (research informed teaching) who then graduate and develop new curriculum for clinicians (teaching informed care). The types of Care Flows are presented in Figure 1.

From Figure 1, our findings, together with literature from previous studies, show that research informs care through four interactive practice channels labelled as RC1, RC2, RC3 and RC4. Teaching informs care through TC1-TC4. It is also possible for teaching to inform care *through* research (RT1-RT3) and for research to inform care *through* teaching (RT1-RT3).

The value of partnerships lies in the practice linkages between the three functional missions and the emergence of knowledge flows between them.

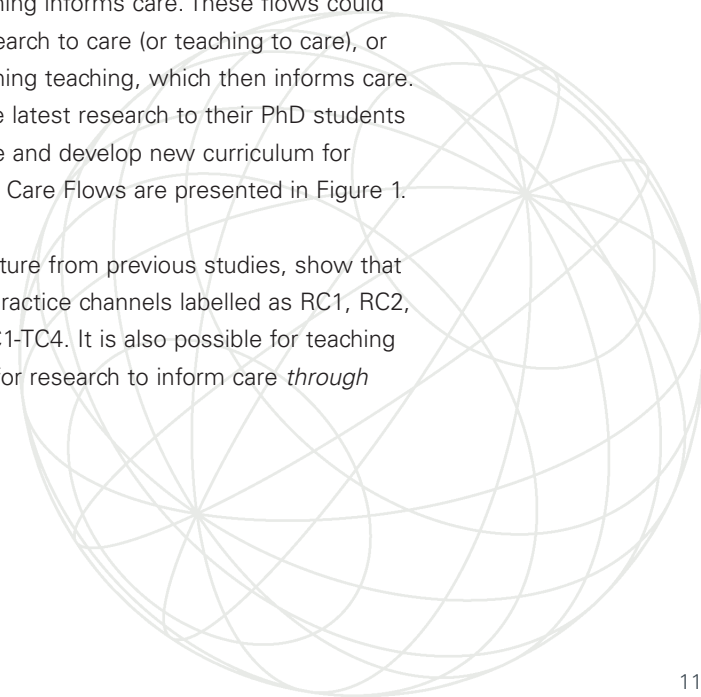
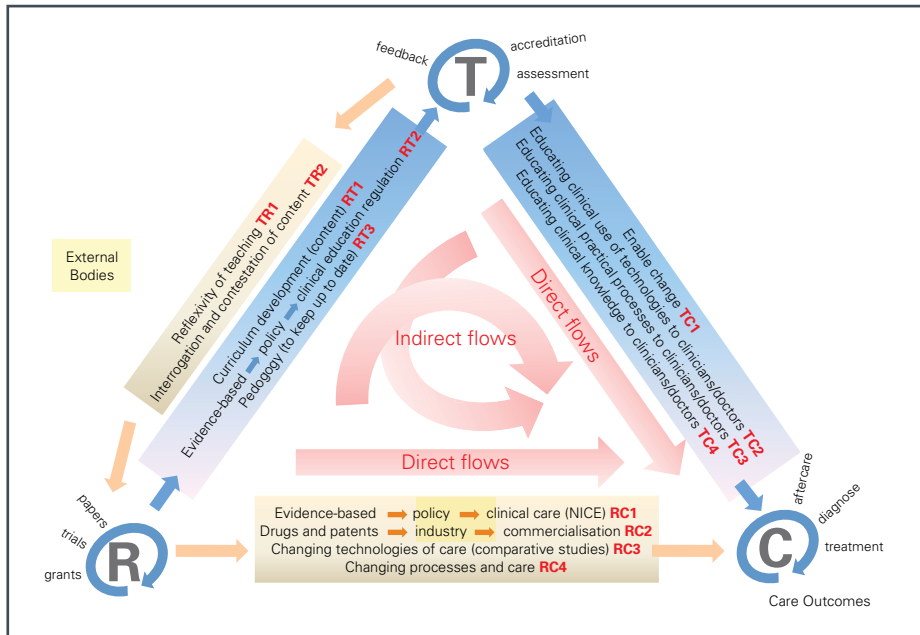


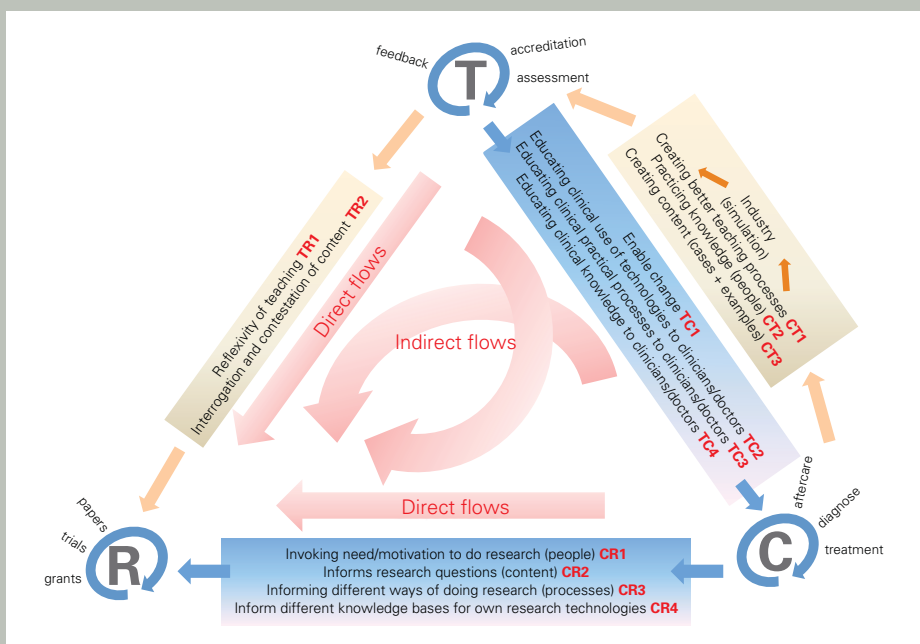
Figure 1: Care Flows of the AHSC System Model – for better care outcomes



Research Flows

Similarly Research Flows emerge from how care or teaching informs research. These flows could emerge from more direct interactions from care to research (or teaching to research), or through indirect interactions i.e. care informing teaching which then informs research. The types of Research Flows are presented in Figure 2.

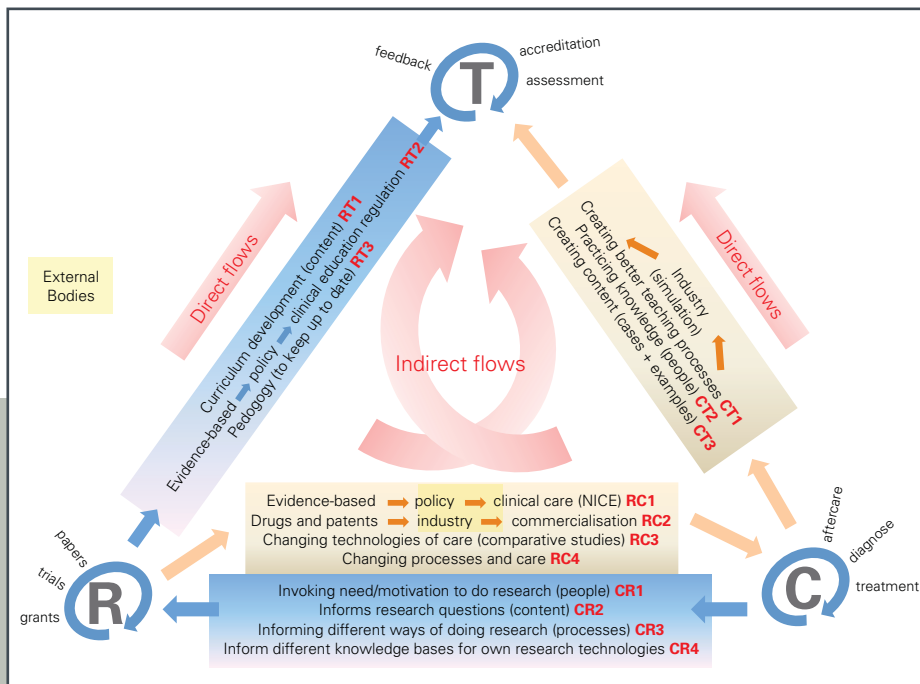
Figure 2: Research Flows of the AHSC System Model – for better research outputs



Teaching Flows

Finally, teaching flows emerge from how research or care informs teaching. These flows could also emerge from more direct interactions from care to teaching (or research to teaching), or it could be through indirect interactions i.e. care informing research which then informs teaching. The types of Teaching Flows are presented in Figure 3. It is worth noting that incentivisation of teaching flows by an AHSCMO could generate better teaching outcomes.

Figure 3: Teaching Flows of the AHSC System Model – for better teaching outcomes



Value to be generated by an AHSCMO

Although the diagrams depict flows as linear, they are not. Knowledge flows are an emergent property at a macro level that is the result of hundreds and thousands of micro-level interactions between individuals collaborating, engaging in knowledge practices and exchanging resources where such interactions are often iterative, non-linear, non-structured and messy. It is important to note that the emergent knowledge flows are non-deterministic and is a property of the system, rather than directed or controlled in some way.

It is therefore important to understand that since knowledge flows are emergent, effort to direct or control can only be achieved through interventions, rather than direct determinism. While direct control and management is possible, complexity may be created as unintended consequences and systemic disruptions may occur elsewhere.

From our framework, we also note that the emphasis of policy towards AHSCs, and of AHSC's own advocacy, has generally been on the research to care flows. Previous studies have suggested that AHSCs are transformative through their facilitation of the speed and quality of the discovery to care continuum. Sir David Cooksey's 2006 report, 'A Review of UK Health Research Funding' also stresses the pathway for translation of health research into healthcare improvement. Yet, our findings show that the process of translational health research in healthcare improvement should be regarded systemically as an emergent property and treated as such, as it is highly dependent on the micro-level interactions within the system. Consequently, top-down operate/manage/control system may not be the most prudent way to improve the performance of the system.

The reality of translation is that it is achieved through various systemic interactions, sometimes through direct but unstructured individual interactions between research to care, sometimes through indirect interactions through teaching and often resulting in other interactions. In addition, the interactions resulting in flows from care back to research and through teaching also impact on resources that enable direct and indirect research to care flows.



We propose that viewing translational health research as a linear pathway diminishes the more complex and critical individual micro-level interactions that have resulted in that pathway. Describing it as such also results in the failure to appreciate the emergent nature of translational health research, hence privileging a reductionistic command-and-control governance structure, rather than a more systemic interventionistic governance structure.

At the extreme, due to the reductionistic nature of such designs, mechanisms to pre-design such a pathway could result in unintended consequences elsewhere and may impede the very purpose of pre-designing. From a systems-view, the so-called 'gaps in translation' outlined in the Cooksey report may be a consequence of not understanding the system interactions that have achieved the translation.

Recommendations regarding flow

Our findings lead to us to make a number of recommendations

The knowledge flows *emerge* from micro-level resource exchanges and value co-created by individuals and organisations within the system that are tasked to perform research, care and teaching functions (within one individual, as they may fulfil other functions as well).

From our case research, our recommendations are that:

- The key transformation and responsibility of the AHSCMO should be to enable such flows, and not to achieve research, teaching or care outcomes itself.
- Understanding and intervening at a micro-level implies enabling the interactions that contribute to the emergence of such flows. These flows should therefore be the unit of focus, owned by the AHSCMO and excellent flows would be the result of better collaboration and micro-level interactions.
- The improvement in flows is the value generated by the AHSCMO, and it emerges from improvements in the way the AHSCMO has enabled the interactions and collaborations between multiple individuals within the partner organisations. Clearly, the better the flows the better the tripartite mission outcomes.
- However, it is important to note that achieving the tripartite outcomes are the primary tasks of the partner organisations (research/teaching outcomes for university, care outcomes for trusts) and **not** the AHSCMO. The role of the AHSCMO is to assist in those tasks through enabling interactions that result in better flows, and not to be tasked to assist the tripartite missions directly. This would ensure minimal conflict of purpose and policy between AHSCMO and partner organisations, as well as focusing on where the AHSCMO truly enable added value to be created.
- More importantly, the performance of the AHSCMO should be assessed on the value of the **partnership** (i.e. achieving better flows) and how that impacts on partner organisations within an AHSC.

Furthermore, we would recommend that the AHSC management organisation takes a systems approach towards interventions to improve the effectiveness of an AHSC, rather than a pre-designed deterministic approach towards translation. Based on the flow framework proposed the management organisation can actively locate current interactions and activities onto the model and assess how specific micro-level interventions could increase macro-level knowledge flows and the system's overall effectiveness, while at the same time monitoring consequences elsewhere. This would also preserve the autonomy of agents in the system which underpinned previous successes, while intervening where it is most effective.

...we would recommend that AHSC management organisation takes a systems approach towards interventions to improve the effectiveness of an AHSC...

Interventions for better collaboration and greater value from partnering

Since effective collaboration is integral to emerge knowledge flows in the tripartite system and thus creating value, we also considered what interventions could be made to improve that collaboration.

Interventions by AHSCMO as the AHSC's governing body

Behavioural studies have shown that the process towards a particular collaborative behaviour is influenced by personal as well as social characteristics. Our findings suggest that there are three types of micro interventions that can potentially improve collaborations, as illustrated in Figure 4. Such micro-level interventions at individual levels could then emerge to achieve macro level knowledge flows as presented above.

Agent Resource Interventions

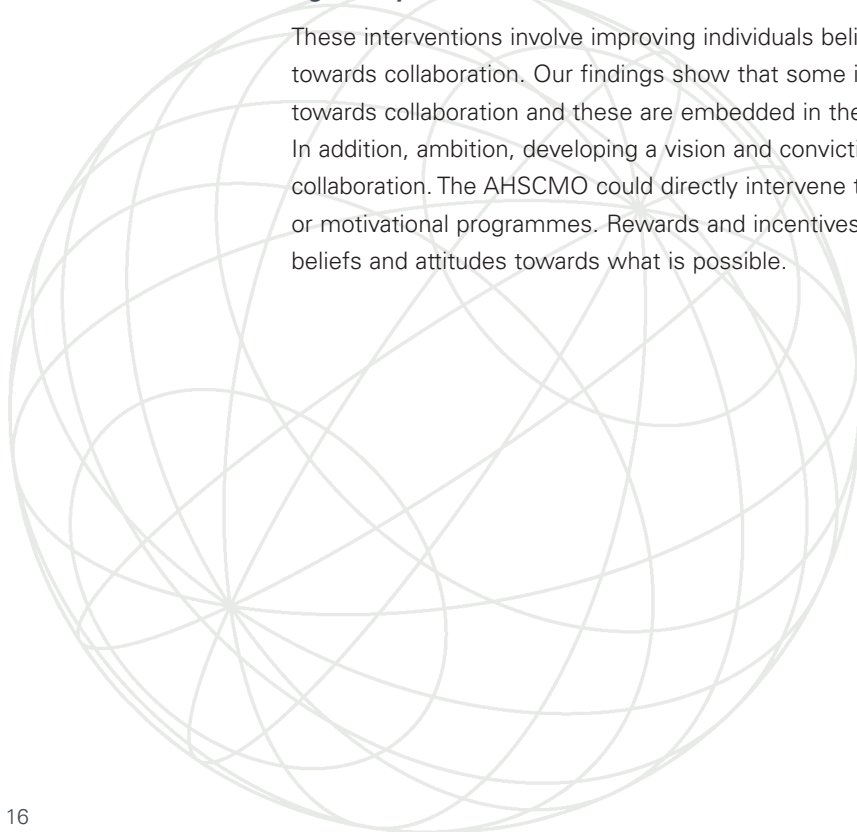
These interventions involve providing resources to individuals (agents) within the AHSC system that would allow them to collaborate. These include:

- grants and other monetary resources
- freeing of time (through grants or other means)
- providing equipment
- better transferability of equipment and materials
- better access rights to resources not owned by themselves
- training on skills to collaborate

Such interventions would be basic drivers towards improved individuals' propensity to collaborate.

Agent Psycho-Social Interventions

These interventions involve improving individuals beliefs, attitudes and intentions towards collaboration. Our findings show that some individuals are more inclined towards collaboration and these are embedded in their belief and attitudinal structure. In addition, ambition, developing a vision and conviction all serve to enable collaboration. The AHSCMO could directly intervene through mindset change or motivational programmes. Rewards and incentives can also change individuals beliefs and attitudes towards what is possible.



Socio-Environmental Interventions

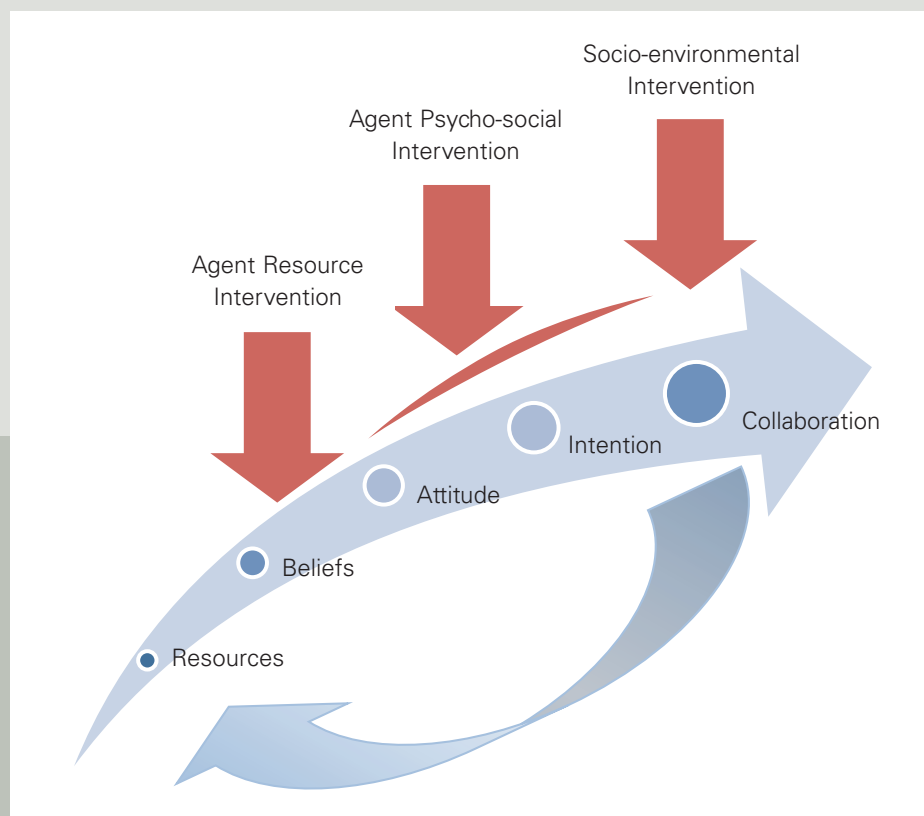
Interventions are about catalysing and enabling collaborations to happen.

Social-environmental interventions can include:

- provision of space for brainstorming and for serendipitous and creative collaborative learning, and these spaces could be physical or virtual, for example through co-location, sharing spaces for research and work posters, etc.
- having individuals with experience to catalyse collaborations
- developing processes and mechanisms for entering into a collaborative space so that individuals find sharing of ideas to be less threatening
- having champions or catalysts to assist individuals to begin their journey towards collaboration
- getting individuals collaborating to start with a smaller role in learning the system
- getting them to develop familiarity with the system and the language of others through networking
- working towards reducing barriers to collaboration, particularly around alignment of partner organisations towards achieving collaborative goals
- proactively developing the community as an intervention for better performance; individuals within the system have described a sense of community they feel as part of Cambridge AHSC, which have spurred much of the entrepreneurial and collaborative spirit amongst individuals

Interventions are about catalysing and enabling collaborations to happen.

Figure 4: Individual (autonomous agents) motivations (and their respective interventions) for enabling collaboration



conclusion

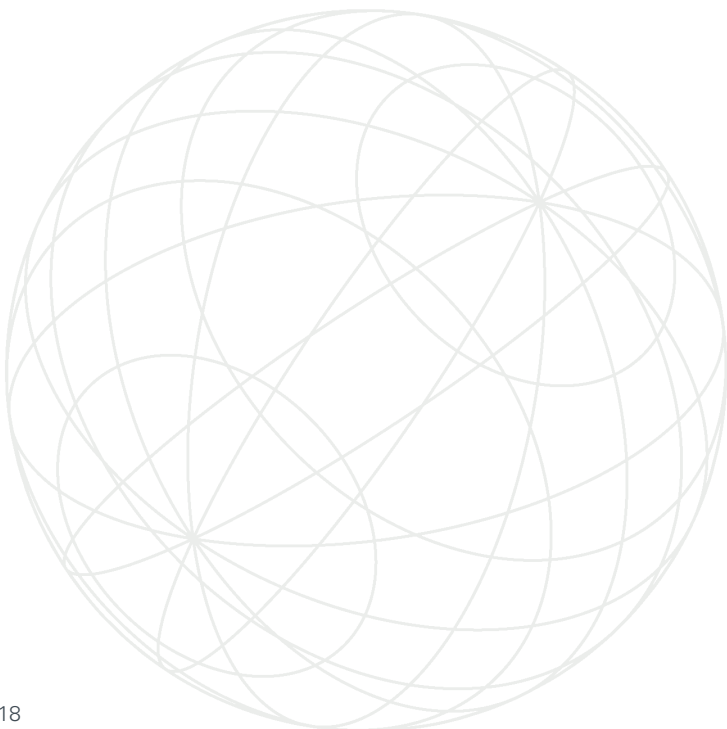
The application of systems theory to AHSCs is a new development and the findings of this study challenge two commonplace assumptions in the institutional literature.

...conceptually and practically it is easier to take a reductionist approach and focus on the individual strands of management...

The first assumption is that overall AHSC performance can be improved by focusing on management of the individual strands of the tripartite mission in isolation: clinical care, health-related research and the education of the healthcare workforce. Our study suggests that not only is this reductionistic approach inappropriate, it creates unnecessary complexity and greater barriers to collaboration. Closely related to this is the notion that measuring performance for each strand in isolation will provide an adequate assessment of the performance of an AHSC as a system, and of the AHSCMO as the manager of that system. This approach is flawed as it measures the aggregated 'parts' only and fails to measure how the value created by the 'whole' system is greater than the sum of such parts. Our study suggests that the knowledge flows, i.e. the connections rather than the outputs, should be the unit of focus for assessing the performance of both the AHSC system and the AHSCMO.

The second assumption is that the processes that improves an AHSC are linear and that management of these processes will be predictable. As our study has found, the mindset to manage a complex collaborative system of autonomous individuals should be that of creating systemic platforms for enabling, empowering, intervening and incentivising rather than top-down control, determine and direct.

For institutional management, our findings present a challenge: conceptually and practically it is easier to take a reductionist approach and focus on the individual strands of management both in terms of management interventions and performance assessment. Our study suggests that such an approach is really missing the point, which is to focus on how to nurture and sustain the flows in the system. The task of management may, therefore, be to cultivate particular properties in the AHSC as a system and to focus on identifying and addressing blockers and enablers of flow. This will not be easily explained to those not versed in system approaches and the complexity of collaborative university/health system partnerships.



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