



Impact of organizations on healthcare-associated infections

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SUMMARY

Resolving the challenges presented by healthcare-associated infections requires a ‘whole healthcare economy’ perspective encompassing the interactions between biological, therapeutic, and structural factors. The importance and influence of organizational characteristics is receiving increasing attention. This article reviews some keys features that can facilitate the success of patient safety initiatives related to healthcare-associated infections, and highlights areas for further consideration and research. The impact of guidelines and indicators is discussed, together with some challenges resulting from the need to maintain and sustain clinicians’ commitment to desired behaviour. Novel technology solutions such as electronic healthcare games and engagement with social media platforms may serve to support and reinforce traditional patient safety improvement initiatives. Recently published essential structural components and indicators of infection prevention and control programmes stress the need for comprehensive approaches that integrate multimodal and multidisciplinary solutions and strive to reinforce an organizational culture of patient safety.

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Introduction

To successfully address healthcare-associated infections (HCAIs), infection prevention and control (IPC) interventions must acknowledge and address the interplay between host, pathogen, healthcare workers, and healthcare organizations. Moreover, it is vital to adopt a ‘whole healthcare economy’ perspective, recognizing that primary and community care must jointly engage in improving IPC and antimicrobial

stewardship, and that responsibility to avoid HCAIs must be shared between front line and managerial staff.¹ For the purposes of this article, the hospital will be the organizational unit explored, although the socio-political context of any healthcare system or structure is acknowledged to have a major impact on organizational features.

The context in which modern healthcare organizations operate is critical, with requirements to respond to societal demands, conform to culture, priorities and values, and adapt to policy and politics while immersed in economic and financial uncertainty.² Therefore, organizational capacity to successfully implement improvement strategies, and to adjust and thrive in such shifting environment, is likely to depend on the institutional climate and organizational culture.³ Understanding the relation between diverse features of organizational culture and patient safety performance that includes infection

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prevention and control has been recognized as crucial.⁴ However, extricating key components of such connections and describing how they can be strengthened has often been problematic.⁵

As previously suggested, identifying the features contributing to adequate or suboptimal performance in a particular organization may not be straightforward. In reality, getting an organization to agree on common objectives and shared values can be harder than expected, particularly in light of the dynamism required to function within and respond to uncertainty. 'Organizational culture' does not just mean a particular way of doing or thinking; it encompasses the set of norms, values, and assumptions prevalent within the entire organization.⁶

Additionally, the views about institutional approaches to IPC and patient safety can be highly variable between different professional groups or hierarchical levels, and are likely to be reshaped over time and in response to internal and external influences, including political pressure. For such reasons, the inconsistency between group opinions alongside the temporal variability makes it essential to continually renew institutional safety activities.

Maintaining patient safety related to HCAI

It is now clear that traditional IPC activities such as promoting hand hygiene should be coupled with antimicrobial stewardship, and that these two activities should be integral to a holistic patient safety culture.⁷ By integrating activities it is possible to exploit the synergy between them as well as economies of scale, for example by the use of care bundles and checklists, making better use of resources. Consideration of some clinical, technical, behavioural, and organizational aspects can facilitate the introduction and sustainability of HCAI patient safety activities.

Compliance with policies and clinical practice guidelines

Policies and guidelines can play a vital role in quality improvement and patient safety initiatives.⁸ However, the multiplicity and complexity of factors that contribute to organizational cultures (including management style, and institutional norms and procedures as well as the expectations to comply with them) explain why simply introducing policies and guidelines is not sufficient to ensure appropriate behaviours or outcomes.⁹ This is often evident when reviewing failures leading to HCAI transmission and in the frequent reports of consistently low levels of clinician engagement and compliance with policies.¹⁰ Even when guidelines are successfully adopted, clinicians' commitment to them tends to decay with time owing to information overload, competition from other guidelines, or complexity of the guidelines and the evidence underpinning them.¹¹

Poor compliance with policies is widely attributed to lack of awareness or agreement, but there may also be more subtle contributors to it, including a choice to conform to unwritten behavioural rules, such as those described among junior doctors prescribing antibiotics.^{12,13} Moreover, homogeneous national or even local policies may not be sufficiently responsive to individual patient needs and clinical characteristics, especially in antimicrobial prescribing.¹⁴

It has been suggested that guidelines will hardly ever be used entirely as they were designed, owing to a collective process of interpretation influenced by their real or perceived benefits and flaws, and re-interpretation in the light of experience of their use.¹⁵ Thus it is perhaps not surprising that we do not understand the factors that influence behaviour and decision-making, particularly regarding antimicrobial stewardship and IPC activities, including hand hygiene.¹⁶

Performance-monitoring and indicators

Quality indicators related to HCAI are being promoted in order to energize improvement initiatives.¹⁷ HCAI rates are being incorporated into the performance criteria reported by managerial teams at board level, and aggregated into hospital dashboards as early warning systems.¹⁸ The strategic perspective afforded by dashboards can facilitate the monitoring of the impact of competing and interacting priorities, including any unintended consequences.

In addition to such objective aspects, indicators can be of benefit in assessing valuable organizational infection prevention traits such as resilience, fundamental to the maintenance of services in the presence of persistent stressors, such as those mentioned above, or sudden and emerging events such as outbreaks.¹⁹

Quality indicators seem to have evolved from internal tools aimed principally at encouraging clinical teams to appraise their performance, often in comparison with other teams, to publicly accessible measures of patient safety that can be used to inform care choices.²⁰

Team composition

The multiplicity of healthcare professionals involved in delivering care and contributing to infection prevention and control can have clear benefits for patients; however, it is crucial that different groups of healthcare workers align their professional priorities with those of the organization and of other professionals.²¹ For example, seemingly clear and well-known procedures such as the use and monitoring of peripheral vascular devices can lead to tensions, frustration and resentment due to unresolved ambiguities.²² The fact that multiple teams would practice in the same setting may not guarantee cohesive working practices unless concerted efforts are put in place by the organization to ensure, for example, timely and effective communication. Additionally, the composition of teams should not just be considered at the clinical level, but also at the board and managerial level.²³

Leadership and leaders

IPC improvement strategies have in the past focused on adjusting the behaviours of healthcare professionals (i.e. at the individual level) or the introduction of new technologies (i.e. at the organizational level).^{24,25} But it is likely that healthcare settings working towards implementing quality improvement or patient safety initiatives would fail to secure long-lasting success without the support from institutional and informal leaders.²⁶ For example, hand hygiene initiatives that gain explicit endorsement and participation of managers are much more likely to be successful, with more support for the implementation of initiatives proposed and better outcomes

such as improved glove usage and hand hygiene compliance.²⁷ It is possible for leaders to induce the opposite effect when attempting to introduce HCAI improvement initiatives, perhaps by an overly centralized or rigid approach, with negative patient outcomes.

Leadership can be galvanized by external endorsements. For example, higher level position statements such as the Chennai Declaration stimulated the integration of IPC and antimicrobial stewardship at hospital board level in India.²⁸ Equally, the UK Chief Medical Officer (CMO) Report in 2013 expressed a similar need for healthcare organizations to strengthen practice, and encouraged new methods of organizational and behavioural change to reinforce policy implementation.²⁹ Finally, organizations must ensure that they have identified and gained the support of informal leaders and opinion makers, including patients and users, in view of the growing evidence of their influence on peers.³⁰

Involving patients in healthcare-associated infection reduction initiatives

As indicated, patients and users want to be engaged, to learn about infection prevention and to participate as peers in quality improvement initiatives.³¹ Such participation seems to be beneficial. But patient involvement necessitates organizational determination to address health literacy – the public's ability to understand their required role, comprehend healthcare information and make effective decisions related to such information.³² Whereas a substantial number of citizens are reported to have inadequate health literacy skills, there have been appeals for citizens to review and consider HCAI indicators published by hospitals to inform their care choices.³³

Communication, social media, and technology

When considering how the public interprets information on HCAs, organizations can make use of emerging communication channels such as social media platforms. There is no doubt that patients are active in such platforms, but whereas some key figures such as the UK CMO have rapidly adopted social media to extend the reach and influence of their messages, healthcare organizations in general have yet to consolidate their presence within that sphere. On the other hand, healthcare workers appear to have avidly embraced technology solutions, including smartphones and 'apps', for patient safety purposes.^{34,35} There are unresolved issues about the implementation and governance of these tools, but some benefits have already been reported.^{36,37} Perhaps as a reflection of the pace of technology development, other approaches such as the use of 'g-health' or gamification (the application in non-game settings of the psychological techniques and mechanisms traditionally employed in games) as tools for behaviour change have emerged.^{38,39}

New perspectives on key organizational elements for effective infection prevention programmes

There are two different visions regarding the management of HCAs.^{40,41} Some institutions or healthcare systems have opted for a 'vertical' approach to IPC, a somewhat aggressive

position interested in active surveillance testing to identify carriers of pathogen-specific infections and prevent onward transmission to other patients. Other services have preferred a 'horizontal' approach, more attracted to the application of comprehensive organizational IPC not directly aimed at a particular micro-organism. The two approaches perhaps represent the extremes of the infection prevention continuum.

The recent carbapenemase-producing Enterobacteriaceae toolkit presented in the UK by Public Health England illustrates some of the dilemmas that arise when considering the introduction and implementation of a vertical, pathogen-specific approach based mainly on the screening of asymptomatic carriers.⁴² For example, how would clinicians respond to the requirements to screen a loosely defined group, or deal with a requirement to isolate individuals arriving from particular countries, at times of scarcity of finite resources such as side rooms?

Conversely, horizontal approaches may demand the commitment of considerable technical and human resources to maintain the level of engagement required to sustain quality IPC. Unfortunately, a substantial amount of evidence indicates that healthcare organizations are failing to achieve this, exemplified by audits revealing suboptimal hand hygiene compliance and inappropriate usage of antimicrobials.

Finally, some authors have proposed that, regardless of the approach ultimately adopted, sustained improvements in HCAI may be more closely related to the overall quality of care rather than excellence in the particular area of IPC.⁴³ This view suggests that generalized organizational improvements in patient safety and quality would also influence IPC, and is supported by correlational studies of HCAI incidence in European countries. Notwithstanding the potential methodological concerns associated with ecological studies, such results serve to strengthen the importance of organizational factors such as staffing, skill mix and team turnover, which have been associated with improved (or reduced) performance, demonstrating once more the interaction between technical and organizational features.⁴⁴ The importance of such interaction has been made explicit in recent guidance focusing on key elements of infection control programmes within hospitals.⁴⁵ The systematic review funded by the European Centre for Disease Prevention and Control identified 10 essential structural components and indicators of IPC programmes (Box 1), and explored the feasibility of their implementation as well as the applicability to European healthcare systems and organizations.⁴⁵

Heterogeneity of structural factors make it important to avoid any temptation to simply 'transplant' interventions from one country or setting to another without a robust understanding of contextual factors surrounding the intervention and the characteristics of the host setting. Different methodologies such as realist reviews have emerged in recent years, allowing us to learn about the performance of complex and multimodal initiatives in 'real world' circumstances, and to elicit the contributors to the failure or success of initiatives.⁴⁶

Conclusion

Organizations striving to offer quality care must integrate IPC and antimicrobial stewardship improvement initiatives into a wider, comprehensive safety culture. To achieve a sustained success in this area, leaders must harness organizational

Box 1

Essential structural components and indicators of infection prevention and control programmes, adapted from Zingg *et al.*⁴⁵

1. Infection prevention and control programme in place at the hospital, appropriately staffed and supported.
2. Ideal ward occupancy, staffing, workload, and use of agency and pool staff.
3. Availability and easy access to materials, equipment, and optimum ergonomics.
4. Appropriate use of guidelines, with practical education and training.
5. Involvement of frontline staff in education and training, with an emphasis on team and task orientation.
6. Auditing organized and standardized with timely feedback.
7. Participating in prospective surveillance and offering active feedback, preferably as part of a network.
8. Implementation of quality improvement programmes responds to local condition and is supported by a multimodal and multidisciplinary strategy.
9. 'Champions' are engaged and actively participate in the promotion of intervention strategies.
10. Open working relationships and communication across staff groups drive a positive organizational culture.

change to promote, support, and reinforce infection prevention activities. Focusing on some of these key components can diminish the risk of failure. Finally, emerging technologies such as mobile tools offer opportunities for effective collaboration and broad stakeholder engagement. Embracing these steps is central to inspire excellent care that protects patients from the harm of HCAs.

Conflict of interest statement

None declared.

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