Chapter 20
Translating Technology in Professional Practices to Optimize Infection Prevention and Control:
A Case Study Based on the TRIP-ANT Framework

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ABSTRACT

The aim of this study was to explain how the Polymerase Chain Reaction (PCR) technology was translated into professional practices to prevent and control vancomycin-resistant enterococci outbreaks via an actor-network, based on the integrated framework TRIP-ANT. A single case study was conducted in three purposefully selected sites implementing the PCR-VRE assay. The complete dataset comprised semi-structured interviews with 28 participants and a review of hospital and external documents. A content analysis was conducted. The authors' findings indicate the emergence of four main themes, including illustration of who was involved in the adoption process, attribution of roles and responsibilities, interaction/communication/collaboration mechanisms, and changes in professional practices. Their findings also address five challenges that arose from each theme. The translation of PCR technology into professional practices relies on the enrolment of an organisational, clinical, managerial and financial support network, and on the evolution of practices, communications, and roles and responsibilities.

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INTRODUCTION

The development of healthcare technology plays a key role in the achievement of evidence-based outcomes in patient care (Melnyk and Fineout-Overholt, 2011). The attention paid by managers to healthcare quality and efficiency highlights the need to master the adoption of new technologies, especially in infection prevention and control (IPC) in order to improve the quality of care and productivity of the healthcare system (Kyratsis, Ahmad and Holmes, 2012).

Technology adoption relates to a hospital's decision to acquire a technology and make it available to healthcare professionals for supporting or enhancing their task performance (Ghodeswar and Vaidyanathan, 2008). In recent years, several steps have been taken to support the prevention and control of nosocomial infections (NI), such as the use of rapid screening tests based on the Polymerase Chain Reaction (PCR) molecular technology to enhance vancomycin-resistant enterococci (VRE) infection prevention interventions (Versalovic and Lupski, 2002). Rapidly obtaining results compensates for the resources allocated and reduces the time involved in adopting IPC practices, making it possible to optimize the handling of VRE cases (Diekema et al., 2004). Adoption of technologies has been associated with improved organisational performance (Antoniou and Ansoff, 2004) because it affects the quality, care, costs, and competitive position of the organisation (Ghodeswar and Vaidyanathan, 2008). However, implementing a new technology requires organisational change, particularly surrounding the new IPC procedures, organisation of hospital services and even attribution of new roles within a network of actors, at the macro, meso and micro levels (Attieh, Gagnon and Krein, 2014). As with other innovation in healthcare organisations (Greenhalgh et al., 2005), understanding how IPC technology adoption can transform healthcare practices and outcomes for patients requires a theoretical basis. In previous work (Attieh, Gagnon and Krein, 2014), we discussed the introduction of a conceptual framework that could be applied to understand the dynamics involved in the adoption process of IPC technology. In an effort to identify the outcomes of such a process, we developed an integrated framework based on the Translating Infection Prevention into practice (TRIP) model, developed by Krein et al (Krein et al., 2006) that is based on Rogers' diffusion of innovation (DOI) model (Rogers, 1995), and the Actor-Network Theory (ANT) (Akrich, Callon and Latour, 2006; Callon and Latour, 1986). The TRIP-ANT framework (Figure 1) shifts the focus to the inter-relatedness of the technical and social factors in the adoption process of technologies in healthcare (Attieh, Gagnon and Krein, 2014). Thus, identifying how new technology integration can translate into different responses to change and into the practices of a network of actors involved directly and/or indirectly in the new intra- and inter-organisational processes surrounding the handling of IPC practices (Attieh, Gagnon and Krein, 2014).

The TRIP framework (Krein et al., 2006) was fine-tuned and adjusted to better understand IPC technology adoption and implementation, given the organisational and environmental context. Adapting the framework to the context of infection prevention technology and practice adoption, two phases in the process stand out: the decision-making phase and the implementation phase. Unlike the TRIP framework, which emphasises the intrinsic qualities of the technology adoption and its capacity to spread by contagion (Rogers, 1995), the ANT model (Akrich, Callon and Latour, 1988b; Callon, 1999) focuses on the capacity to unite several allies who will then depend on interactions, negotiations and adjustments of a socio-technical network hoping to advance the technology. This constitutes the concept of translation. Translation involves four processes that are intertwined and interact with each other, "problematization", "interessment", "enrolment" and "mobilization" (Callon and Latour, 1986). Looking at the first step of the translation process, problematisation calls on characteristics of the external envi-