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Review article

Review of successful hospital readmission reduction strategies and the role of health information exchange

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ABSTRACT

Context: The United States has invested substantially in technologies that enable health information exchange (HIE), which in turn can be deployed to reduce avoidable hospital readmission rates in many communities. With avoidable hospital readmissions as the primary focus, this study profiles successful hospital readmission rate reduction initiatives that integrate HIE as a strategy. We hypothesized that the use of HIE is associated with decreased hospital readmissions beyond other observed population health benefits. Results of this systematic review are used to describe and profile successful readmission reduction programs that integrate HIE as a tool.
Methods: A systematic review of literature provided an understanding of the use of HIE as a strategy to reduce hospital readmission rates. We conducted a review of 4,862 citations written in English about readmission reduction strategies from January 2006 to September 2016 in the MEDLINE-PubMed database. Of these, 106 studies reported 30-day readmission rates as an outcome and only 13 articles reported using HIE.
Results: Only a very small number (12%) of hospitals incorporated HIE as a primary tool for evidence-based readmission reduction initiatives. Information exchange between providers has been suggested to play a key role in reducing avoidable readmission rates, yet there is not currently evidence supporting current HIE-enabled readmission initiatives. Most successful readmission reduction programs demonstrate collaboration with primary care providers to augment transitions of care to existing care management functions without additional staff while using effective information exchange capabilities.
Conclusions: This research confirms there is very little integration of HIE into health systems readmissions initiatives. There is a great opportunity to achieve population health targets using the HIE infrastructure. Hospitals should consider partnering with primary care clinics to implement multifaceted transitions of care programs to significantly reduce 30-day readmission rates.

1. Introduction

A health information exchange (HIE) addresses the need for clinicians to have access to patient information from disparate sources in order to improve care coordination and clinical communication during transitions of care [1–3]. At the same time, various transitions of care strategies have become high priority to health systems and are being implemented and studied as part of the primary aim of reducing avoidable hospital readmissions [3]. An important question that still remains somewhat unanswered is: how widely is the HIE utilized to enhance strategies aimed at reducing avoidable hospital readmissions? This review paper is focused on answering this important question as there seems to be potential for leveraging the existing HIE infrastructure as a tool to enhance readmission reduction strategies. The United States has substantial investments in technologies that enable health information exchange, which in turn can be deployed to reduce hospital readmission rates in many communities [4].

Based on nationally recognized standards, HIE is defined as the transfer of electronic health information – laboratory test results, medication lists, and other clinical information – among organizations and providers [4]. Physicians, hospitals, and health systems decide on how to actually engage in health information exchange. They could participate in a community HIE organization or an enterprise HIE developed by a health system to connect affiliated hospitals and physicians in their network. While potentially complimentary, the current health policy and market environment create a stronger business case for the enterprise HIE [5]. In this study we consider both community and enterprise HIE if used as part of an intervention or

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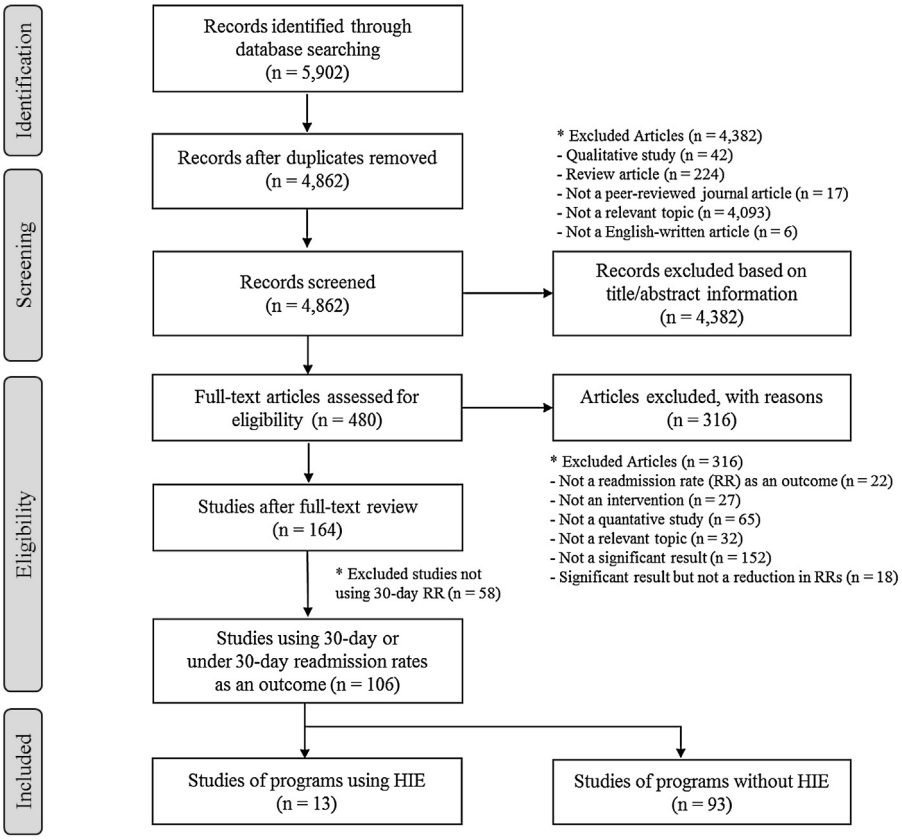

Fig. 1. Flow Diagram of Review Process.

strategy to reduce avoidable 30-day readmission rates.

Although federal health policy around interoperability can influence the use of HIE for readmissions (and therefore this study results), there has not been significant change in health policy legislation in the U.S. during the last two years. In 2015, the Federal Health IT Strategic Plan was released which continues to encourage interoperability between providers and institutions as part of the commitment to enhance the health infrastructure [6]. This plan includes a national roadmap for interoperability standards, and the development and advancement of health information exchanges in communities and health systems. This federal interoperability roadmap does not specifically provide use cases or foci on readmissions currently.

Avoidable 30-day readmissions are a financial and clinical burden to patients and the health systems. Therefore, new strategies and processes for transitions of care focused on reducing 30-day readmission rates are emerging and being studied within the U.S. The role of HIE in supporting clinical outcomes and reducing cost of care, including reducing avoidable 30-day readmissions, has been recently featured in at least three comprehensive review papers. A systematic review from 2014 evaluated the evidence of the use and effect of HIE on clinical outcomes. The researchers identified primary associations between HIE and reduced emergency department use and cost of care in some cases [7]. Another more recent systematic review of HIE's impact on quality of care and cost highlights the limited evidence in peer reviewed literature. The authors attribute this lack of evidence to 1) the limited use of HIE as it is still in its infancy in the U.S. and 2) the challenge of a rigorous study of HIE impact on cost and quality of care due to study design limitations [8]. Finally, a third systematic review of the outcomes associated with the use of HIE identified relatively low-quality evidence for associations between HIE and reduced diagnostic testing, emergency department visits, hospital admissions, and public health reporting [9]. Few studies focused on 30-day readmissions as the outcome variable. All three research teams suggest further research to identify and understand success factors for HIE and a need for rigorous research to provide stronger evidence for the benefits of HIE. None of these recent reviews have focused on the role of the HIE in strategies and initiatives to reduce 30-day hospital readmission rates, which we have identified as a potential area of impact and an opportunity for the underutilized HIE to show evidence of benefits.

With more complete patient information, capabilities to coordinate care, and analytic capabilities (like real time risk stratification), the enterprise HIE is viewed as a “primary strategy” to support developing Accountable Care Organizations (ACOs), arrangements for risk sharing, Medicaid payment reform opportunities, and bundled payments [7]. Therefore, we aim to analyze how effectively community and enterprise HIEs help facilitate transitions of care for patients. With avoidable hospital readmissions as the primary outcome variable, this study profiles successful readmission reduction initiatives that report using some form of HIE. We identify and describe the current inventory of evidence-based readmission reduction strategies that incorporate the HIE as a strategy or a tool. Informed by the results of the systematic literature review and taxonomy of various readmission strategies studied, we present these results and discuss further opportunities for leveraging the HIE in achieving hospital readmission rate targets.

2. Methods

2.1. Study design

We performed a systematic review of peer-reviewed literature to provide a better understanding of the use of HIE as a tool or a strategy to reduce avoidable hospital readmission rates. The results of the systematic review were used to describe and profile successful readmission reduction programs using HIE as a strategic tool. This review was reported according to guidelines of the Preferred Reporting Items for Systematic Reviews and Meta Analyses (PRISMA) [10]. The review

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