Executive Summary

Medicare penalties began for hospital readmission nationwide in 2012. To avoid these penalties, hospitals must maintain below-average rates of readmission. Specific care practices have been shown to reduce readmission rates, but these practices are not cost-effective when applied to every discharge. Technology can help providers identify patients at highest risk for readmission and improve the cost effectiveness and precision of readmission prevention efforts. Together these create significant return-on-investment opportunities for hospitals and Accountable Care Organizations (ACOs).

Background

In 2009, a study in the New England Journal of Medicine profiled 30-day readmission rates for Medicare patients. It found that approximately 1 in 5 patients readmitted and that suboptimal continuity of care after discharge was a source of poor quality and high cost. This study and others pressured the federal government to find ways to reduce hospital readmissions. The outcome was authority granted in the Affordable Care Act of 2010 for Medicare to penalize hospitals with above average readmission rates. The penalty began at 1% of total Medicare revenue and examined only three conditions (Pneumonia, Heart Attack, Heart Failure). Starting in October 2014, it escalated to 3% of Medicare payments and includes an expanded scope of clinical conditions. The outcome was authority granted in the Affordable Care Act of 2010 for Medicare to penalize hospitals with above average readmission rates. The penalty began at 1% of total Medicare revenue and examined only three conditions (Pneumonia, Heart Attack, Heart Failure). Starting in October 2014, it escalated to 3% of Medicare payments and includes an expanded scope of clinical conditions. For the average health system, this now equates to several million dollars at risk.

Since readmission penalties are relative, they will continue to affect below-average hospitals even as rates come down nationwide. Billions have already been saved by this federal initiative which represents an early step in the transition from fee-for-service to the value-based-purchasing of health care.

Are Readmissions Preventable?

Many factors influence a patient’s readmission risk. A large number are clinical, some are sociodemographic while others draw from appropriate and timely care interactions. A key question physicians, nurses and health care executives often ask about readmissions is “are they preventable?” According to three lines of evidence, the answer is yes:

1. While no hospital can prevent every readmission, effective care strategies for readmission reduction have demonstrated 15-40% reductions in readmission rates as documented in the clinical literature.
2. If readmissions were not preventable, variation between hospitals would largely be random after adjusting for acuity and demographics. In contrast, high quality hospitals consistently outperform their peers with lower readmission rates.
3. If readmissions were not preventable, then the government’s penalty would have minimal impact. Since 2011, a statistically significant decline in readmissions has been observed nationwide.
READMISSION REDUCTION PROGRAMS

Several programs have been launched nationally to reduce hospitals readmission rates. Five of the largest programs achieving widespread adoption include:

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<tr>
<th>INITIATIVE</th>
<th>SPONSOR</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Project RED</td>
<td>Boston Medical</td>
<td>Early research program with multiple successes.</td>
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<td></td>
<td><a href="https://www.bu.edu/fammed/projectred">https://www.bu.edu/fammed/projectred</a></td>
<td>Comprehensive approach.</td>
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<tr>
<td>SHM Project BOOST®</td>
<td>Society for Hospital Medicine</td>
<td>Cross-industry collaboration of hospitals and payers.</td>
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<td><a href="http://www.hospitalmedicine.org/boost">http://www.hospitalmedicine.org/boost</a></td>
<td>Widely used toolkit.</td>
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<td>STate Action on Avoidable Rehospitalizations</td>
<td>Institute for Healthcare Improvement</td>
<td>IHI and Commonwealth Fund initiative to reduce</td>
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<tr>
<td>INTERACT</td>
<td>Interventions to Reduce Acute Care Transfers</td>
<td>Primarily focused on nursing home and post-discharge</td>
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<td><a href="http://interact2.net">http://interact2.net</a></td>
<td>services and approach.</td>
</tr>
<tr>
<td>The Care Transitions Program</td>
<td>The Care Transitions Programs</td>
<td>Stresses importance of care team, family caregivers</td>
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These are not the only programs for readmission reduction, but each shares common-sense elements to improve care continuity. These interventions can generally be divided into three categories by timing:

- **During hospitalization of the patient** (e.g. patient education, team coordination)
- **Nearing or during hospital discharge** (e.g. teach-back discharge instructions, medication reconciliation, scheduling follow-up appointments, written care plans)
- **Post-discharge** (e.g. contact patients at home, communication between providers, telemonitoring, health coaches, patient engagement, medication adherence and follow-up appointments)
COST EFFECTIVE INTERVENTIONS
When implementing programs for readmission reduction, several considerations are critical for efficiency and cost-effectiveness. First, a ‘one-size-fits-all’ program is not the best approach. Adding all possible interventions to every discharge burns-out and frustrates clinical staff. In addition, it does not acknowledge patient specific needs for education and engagement. A better approach is to triage interventions based on patient risk. Under this model, interventions can be tailored to those patients at high risk which represent the majority of hospital 30-day readmissions as illustrated below.

READMISSION DISTRIBUTION
Interventions that reduce the rate of readmission will have the largest impact among **high risk patients**.

INTELLIGENT INTERVENTIONS THROUGH READMISSION PREDICTING
There are multiple ways to triage patients at risk of readmission. While dozens of predictive models have been developed and published over the past several years, many suffer from two drawbacks:

1. Readmission prediction requires manual patient review. This means that a clinician must spend time aggregating patient information for entry into a manual or semi-automated tool. The downside here is excess clinical time spent data gathering which is prone to human error in collection and calculation.

2. Some automated models are available but only after time-intensive and expensive implementation. This generally includes resource intensive data mapping, normalization, warehousing and analytics.

Medicity’s approach to readmission prediction solves these challenges by only using data collected in existing clinical workflows and by using data interoperability standards to access this information. This provides lightweight and quick implementations at an affordable cost to enable favorable return-on-investments for both hospitals and ACOs.

Notes: Based on development of readmission model with c-statistic in range 0.70-0.80. Model distribution assumes adult-only non-pregnancies in discharge population.
RETURN ON INVESTMENT: HOSPITAL

We apply a set of simple assumptions in estimating return-on-investment. These assumptions may vary from any specific implementation but form an illustrative model of potential financial savings:

- Only high risk patients receive attention from nursing and pharmacy staff beyond normal discharge protocols.
- Every high-risk patient receives additional follow-up (either at discharge or through telephonic follow-up) to review medication adherence, pain management, physician follow-up scheduling and social needs. This is estimated at 10 minutes on average per care interaction.7
- For a subset of patients with poly-pharmacy needs (i.e. >8 medications), additional follow-up is performed by a hospital pharmacist. This includes time for medication education as well as regimen adjustment based on potential interactions, clinical factors or financial constraints of the patient. This is estimated at 15 minutes on average per care interaction.
- Additional interventions that include ambulatory follow-up or home health are scheduled as needed but not included as model costs since they are separate reimbursable events.
- The model is based on 294-bed Medical Center of Trinity (FL) which has a typical annual readmission penalty ($192,000) from Medicare.

RETURN ON INVESTMENT: ACCOUNTABLE CARE ORGANIZATION

The return on investment for an ACO would exceed the savings expected to accrue for penalty avoidance for a hospital.

With the assumptions to the right, for a moderate-sized ACO, a comprehensive program for readmission prevention would save $4.3 million per year in Medicare costs. To achieve such savings, labor and technology investments would be required exceeding a typical hospital investment. In addition new billable care interactions (e.g. physician appointments and home health) would reduce net savings available for shared savings. Still we estimate $3.6 million would be available for the 50-60% shared savings distribution based upon the specific distribution models of the ACO.
CONCLUSION
Readmissions remain a priority for hospitals and a prime opportunity for shared savings under Medicare's ACO program. Several proven practices exist to reduce the rate of readmission but should be paired with automated predictions for optimal effectiveness. Identify and triaging patients at high readmission risk are critical components of effectively implementing readmission reduction programs.

COMPANY NOTICE
Mediticity has prepared this guide and illustrative financial modeling based on review of the clinical literature, publicly available Medicare data and industry experience working on readmission reduction initiatives. We would welcome the opportunity to customize this assessment to your institution and speak further about our solutions. While we have made efforts to outline potential care workflows and financial estimates of implementation, Medicity provides no guarantee or warranty of information accuracy or completeness provided in this study. Please assess and consider any recommendations herein for their appropriateness to your organization.

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Mediticity is a leading provider of network-enabled population health, connecting thousands of facilities in more than 100 of the nation's leading private and public health information networks. Medicity powers clinically connected communities and processes more than 3.6 billion transactions each year. The Medicity Network provides the data foundation and integrated workflow solutions to enable today's population health management objectives. Medicity's solutions promote timely clinician engagement, improved transitions of care, reduction in duplicative services and the opportunity for patients to take an active role in their personal health. Medicity is an independent subsidiary of Aetna (NYSE: AET). For more information, visit www.medicity.com.

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2ProjectRED from Boston University Medical Center. https://www.bu.edu/fammed/projectred.
4Coleman EA, Parry C, Chalmers S, Min SJ. “The Care Transitions Intervention: Results of a Randomized Controlled Trial” Archives of Internal Medicine 2006;166:1822-8.

This study was conducted and the white paper written by Diameter Health.