EQuIP, An Evidence-based Quality Improvement Process: Improving the Speed to Insight

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Background

• Having a systematic approach for extracting previously unknown and important actionable information and knowledge from disparate sources of data will create value for healthcare organizations

• This knowledge can be used to improve care by leveraging clinicians’ and administrators’ experience to objectively generate opportunities that might otherwise go undiscovered
Challenges

Despite the recognition that data can create value, only a few healthcare organizations have adopted rigorous analytic approaches to support their data mining efforts.

Percentage of executives who cite the following as obstacles of advanced analytics.

- **Hard to integrate with existing processes and systems**: 47%
- **Expertise and technologies are too expensive**: 40%
- **Management doesn't understand it**: 37%
- **Can't get enough people with expertise**: 35%
- **It has been oversold**: 18%

Healthcare Data are Complex

• While other industries have well developed data exploration processes (e.g., banking), healthcare is still developing its methods, with
  • miscellaneous data sources and types,
  • huge quantities of unstructured data,
  • diverse measuring precision, and
  • lots of uncertainties about data quality
Objective

• To propose an evidence-guided systematic approach for exploring data to identify QI opportunities.
Assembling the needed data from various sources to examine local practices

- EHR Data
- Clinical Databases
- Digital Data
- Claims Data
- Geospatial Data
- Patient-Reported Outcome Measures

Data analytics

- Traditional Descriptive Statistics
- Traditional QI Tools
- Root Cause Analysis
- Pareto Chart
- SPC Charts
- Process Map
- Advanced Analytics
- Geospatial Analysis

Data visualization for business value

- Insight-Rich Illustrations
- Value-Rich Findings
- Annotated Charts
- Actionable Targets
- Measurable Impact

Specify improvement opportunities in the context of business value.

Horizon scanning: structured approach that provides a systematic process for exploring data

Provide parameters for guiding data exploration. Use prior available knowledge to define the scope and to add specificity to the data exploration.

Set the data exploration goals and build a logic model to describe the inputs and the outputs.

Build a robust dataset by combining relevant data sources

Extract only the data relevant for the data exploration.

Spend time cleaning, merging, defining, and validating the data. This should be a combined effort of the data scientist and business or clinical expert.

Try to fit the logic model with the data.

Combine different tools to draw insight from your data

Identify patterns, anomalies, and opportunities. Seek to answer the following questions: Who?, When?, Where?, What?, How?, and Why?

Begin with broad descriptions and then focus on areas of value, such as unwarranted variation or worse than expected clinical outcomes. Risk adjust and use benchmarks for meaningful comparisons.

Clearly represent key points, tell a story with your data. Help stakeholders interpret your results, explain what they mean.

Present data only if it can lead to: safer care, better care, reduced costs, less waste, less unnecessary care, or innovation.
The Revolving Door Of Rehospitalization From Skilled Nursing Facilities

By Vincent Miu, Gina Intrator, Zhouhan Feng, and David C. Grabowski

The Revolving Door Of Rehospitalization From Skilled Nursing Facilities

Abstract

Almost one-fourth of Medicare beneficiaries discharged from the hospital to a skilled nursing facility were readmitted to the hospital within thirty days; this cost Medicare $4.34 billion in 2006. Especially in an elderly population, cycling into and out of hospitals can be emotionally upsetting and can increase the likelihood of medical errors related to care coordination. Payment incentives in Medicare do not encourage providers to coordinate care. Reviewing these incentives could achieve major savings for providers and improved quality of life for beneficiaries.

Devices

Day-case device implantation—A prospective single-center experience including patient satisfaction data

Jessica Peplak RN, Bette Randell RN, Carolyn Campbell-Colin RN MSN, Ruw Kadzirwa MBBS FRCP, Ed Peter Melcher FRCP, Pats Unkhen MSF, MFSP, Francis Munguthi MA FRCP, Paul A. Scott MD FRCP, ... See fewer authors —

First published: 23 March 2018 | https://doi.org/10.1111/pace.13224

Abstract

Purpose

Many centers perform day-case cardiac rhythm management (CRM) device implantation. However, there is a paucity of prospective data concerning this approach. We performed a prospective single-center study of day-case device implantation, including data on patient satisfaction.

BJC

The British Journal of Cardiology

Evaluation of a new same-day discharge protocol for simple and complex pacing procedures

August 2016 | BJC | Credit: 160262 | 16.4 | doi:10.1136/BJC20160262

Authors: Thomas A. Nolan, Aaron Bhalotra, Justin Lee, Paul J. Snowdon, Robert J. Bowers, Jonathan Salvi, Nicholas F. Kalland

There is variable adoption in same-day discharge for pacing procedures across Europe. We compared length of hospital stay and complication rates in two cohorts, using a same-day and next-day discharge protocol. Case notes were reviewed for 128 consecutive patients attending our tertiary centre for device implantation to establish the rate of hospital readmission and complications. These comprised 164 patients in the next-day discharge cohort, and 123 from the same-day cohort. All pacing procedures, including cardiac resynchronisation therapy (CRT) and implantable cardioverter-defibrillators (ICD), were included.

Cardiovascular Revascularization Medicine

Safety and predictors of next-day discharge after elective transfemoral transcatheter aortic valve replacement

Samantha Sabher, Yeniorple Teynor, Shreve Ennor

The role of TAVR in the management of symptomatic aortic stenosis was recently established in the first-in-human trials of the Sapien valve. Patients were enrolled sequentially and we conducted a single-centre study of the safety and predictors of next-day discharge after an elective transfemoral transcatheter aortic valve replacement.

PACE

Parenteral Anticoagulation Therapy and Implantable Cardioverter Defibrillator Implantation

Gatis Attems, BSC (FLA), MBCB, Christopher James McAlpin, MBCB, MRCP, PGMED

Structural Focus on TAVR

Predictors and Clinical Outcomes of Next-Day Discharge After Minimalist Transfemoral Transcatheter Aortic Valve Replacement

Northlin Kamitsuka, MD, John Weiler, MD, Patricia Kuehn, RN, Stamatios Lambrakis, MD, Jose Hinojosa, MD, Frank Czakon, MD, Jose Cordova, MD, Ariel Patel, MD, Jessica Rosillo, MD, Leslie Alpharo, MD, Andy Song, MD, Hope Coughlin, RNC, Tom D’Amore, MD, Bradley Ladawern, MD, Chandor Denby, MD, Reiko Marumoto, MD, Robert Guay, MD, James Stewart, MD, Vindu Thakore, MD, Peter C. Bloed, MD, Vasant Bhaskaran, MD

Cardiac resynchronisation therapy (CRT) and implantable cardioverter-defibrillator (ICD) implantation improves morbidity and mortality in selected patients. Many centers allow patients overnight. We evaluated the safety, feasibility, and cost savings of same-day CRT/ICD device implantation by performing a retrospective study of all consecutive elective CRT/ICD implants at a tertiary center from January 2009 to April 2013. All emergency and urgent cases were excluded. Data were collected on baseline demographics, intraoperative data, complications, and outcomes. A total of 493 CRT/ICD implants were performed during this period. The same-day group was 64% male, mostly 5 to 6 weeks (mean 30), and long term (6 months), and mortality (15%) and 1 year. Compared to routine patients there were significantly more planned next-day discharge for CRT/ICD procedures. A cost analysis was performed to evaluate cost savings of the same-day policy. A total of 491 devices were implanted during this period. 267 were elective (37 planned overnight; 221 planned same-day). All of 220 cases of CRT in 178 patients and 48 ICDs. There were 26 cases of CRT with a planned overnight stay and 2 cases with a planned overnight stay (4.8% vs. 11%) but specifically no differences in admission, day of discharge, readmission and long-term complications as follows. The same-day group had similar complications as the routine group.
Results

• Our evidence-based approach was tested on one of Kaiser’s target clinical areas of importance, interventional cardiology.

• Three potential improvement opportunities were identified:
  • network leakage;
  • avoidable hospital days; and
  • preventable 30-day hospital readmissions.

• Preliminary estimates suggest that our work could lead to approximately 1 million dollars in savings and up to 250 avoided hospital days while improving the quality and safety of care to our members.
Finding Variation among PCI, Pacemaker, ICD, TAVR and Open Heart Surgery Cases

"Uncontrolled variation is the enemy of quality." W. Edwards Deming

Approximately 15% of non-emergent PCI and Pacemaker cases are done outside Kaiser

### Care outside Kaiser

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Average LOS SMC</th>
<th>Average LOS SMC</th>
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<tbody>
<tr>
<td>PCI</td>
<td>1.8</td>
<td>4.6</td>
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<tr>
<td>Pacemakers</td>
<td>2.1</td>
<td>4.6</td>
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</tbody>
</table>

- **Longer LOS**
- **More Imaging ($ & ^*)**
- **More expensive**
  - Higher % of cases coded with MCC

MCC $19,396
w/o MCC $12,658

MCC $22,336
CC $15,727
w/o CC/MCC $12,898

- **The proportion of same-day discharged patients was low in general**
  - **PCI**
    - 26% of patients go home the same day
  - **Pacemaker Implants**
    - 24% of patients go home the same day
    - 74% go home the next day
  - **ICD Generator Procedures**
    - 6% of patients go home the same day
    - 50% go home the next day

### Potential SDD by Procedure

- **Percentage of Pacemaker patients**
  - 88%
- **Percentage of ICD patients**
  - 79%

### 30-Day Readmissions

- **867 open heart surgery cases** performed at SMC between 2016-2017
- **30 day readmission rate 9.9%**
  - Average cost of CABG readmission $14,600

2017 Readmission Rate
- **Extended Care = 15.4%**
- **Home = 8.2%**

- **2X more likely to be readmitted if female >= 70 years old**
- **3X more likely to be readmitted if the patient is female, seventy, and discharged to extended care**

<table>
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<tr>
<th>Year</th>
<th>Volume</th>
<th>Procedure</th>
<th>Volume</th>
<th>Procedure</th>
<th>Volume</th>
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<tr>
<td>2017</td>
<td>590</td>
<td>PCI Procedures</td>
<td>364</td>
<td>Pacemaker Implants</td>
<td>123</td>
<td>ICD Generator Procedures</td>
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<td>Open Hearts</td>
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<td>109</td>
<td>Structural Heart Procedures</td>
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</tbody>
</table>

1 Strategies for reducing readmission following CABG

2 Significantly higher
Lessons Learned

• Engagement, engagement, engagement.
• Be a trusted broker and ambassador of data.
• Need valid comparators.