CARE REDESIGN REPORT: 2010-2013
A special thank you and dedication to the physicians, nurses, technologists, social workers, therapists, administrators and team members who worked tirelessly to improve patient care while allowing Massachusetts General Hospital and the Massachusetts General Physician Organization (MGPO) to remain focused on leading the nation in health care delivery.
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“My vision for care redesign at Mass General is straight-forward: I want to see teams working in every corner of this institution to make the patient experience better, more efficient and of greater value.”

Michael R. Jaff, DO
Director, Mass General/MGPO Care Redesign
For the past two years, I’ve had the privilege of serving as the Director of the Mass General/MGPO Care Redesign. During this time, I’ve had the opportunity to witness the impact of Care Redesign. We decided to produce this report on the Mass General/MGPO Care Redesign program to highlight the outstanding contributions of our 20 Care Redesign teams and demonstrate what actually happens when committed professionals work together to transform care of our patients to improve the value of the experience.

Care Redesign accomplishes several things: it provides a better patient experience; it provides a better employee and support staff experience; and it reacts to the surrounding environment by bringing value to patient care. It is truly an incredible process.

Each team identified to participate in Care Redesign is different—from our teams looking at cancer to our outpatient teams focused on diabetes, primary care and rheumatology, or our chronic disease-focused teams—and it has been remarkable to see the enthusiasm, excitement, dedication, commitment and hard work by our physician, nursing, and administrative leads and all the team members to improve the quality and value of care. Led by Mary Cramer and her incredible team of process improvement experts, we have been able to facilitate rapid change in complex patient care areas, while building a culture of continuous quality improvement within our teams.

Care Redesign has accomplished so much since it was launched by Partners HealthCare in 2010. First, it has tangibly brought people forward to work as a functioning team across a series of intricate initiatives to improve care for the patient. We’ve taken complex patient situations and made them more efficient so that we may reduce hospital lengths of stay, reduce the complexity of care coordination and improve the experience for patients. Our hope is that this work will lead to a better value of care and, while there are challenges and barriers to overcome, I am confident we will succeed.

This year, we held the first Care Redesign Fair to share the accomplishments of Care Redesign with the entire institution. The posters created by each team to highlight its redesign efforts and outcomes are included in the Care Redesign team section of this report, beginning on page 25. The fair also provided an opportunity to learn how another leading academic medical center— the Cleveland Clinic—is approaching Care Redesign through the keynote address by David Longworth, MD, chair of the Cleveland Clinic Medicine Institute and team leader of the clinic’s Value-Based Care initiatives program. It was an enlightening and uplifting event.

The vision for care redesign at the Mass General/MGPO is straightforward—we would like to see teams working in every corner of the institution to make the patient experience better, more efficient, and of greater value. We will accomplish this through the continued commitment and dedication of our tremendous teams, to whom I am very grateful. I hope this report provides you with a perspective on the efforts made by so many at Mass General and within the MGPO to demonstrate how we are improving the value of care for patients.
Mass General/MGPO Care Redesign:

Multidisciplinary teams developing new approaches to deliver more integrated, patient- and family-centered care, focusing on high risk-high impact patient populations
Mass General/MGPO Care Redesign Organizational Structure

- **GEC/Chiefs**
- **POEC**
- **Quality and Safety Steering Committee**
- **GH Operations Committee**
- **PO Operations Committee**
- **Care Redesign Leaders Council**
- **Care Redesign Teams**
Goals of Mass General/MGPO Care Redesign:

- **Improve the value of care**: Change from a volume-based to a value-based organization

- **Deliver more integrated, patient-centered care**: Quality, effective, efficient, equitable and accessible

- **Reduce costs**: While improving outcomes, increasing safety and quality, increasing appropriateness, and enhancing the patient experience
Mission
To identify new, more efficient approaches to deliver integrated, patient/family-centered care, focusing on conditions and episodes, not just the traditional procedures, visits and admissions

Vision
To optimize care while reducing the trend of costs both for the hospital and the payers by bringing together multidisciplinary teams to redesign the processes of care delivery at Mass General focusing on high-stake/high-impact (large volume, large cost) patient populations

Values
Simplify the Structure: Eliminate unnecessary processes and develop evidence-based guidelines and metrics to guide quality improvement

Strategize: Leverage shared knowledge to capitalize on opportunities for efficiency and cost savings

Standardize and Streamline: Reduce unnecessary variation to promote reliable, high-quality care

Serve and Satisfy: Provide service that adds value to our patients

Share and Sustain: Foster teamwork, collaboration and communication to promote continuous improvement
In 2010, Partners launched a comprehensive strategic redesign process designed to respond to current economic pressures and position the organization for continued future success. The Partners Care Redesign initiative was comprised of five teams — coronary artery disease (AMI and CABG), colon cancer, diabetes, primary care and stroke — working across the Partners system to develop more efficient and integrated processes for providing care. Since the launch and early successes of the Partners Care Redesign initiative, Mass General/MGPO initiated three additional waves of Care Redesign teams, bringing the total number of Care Redesign teams at Mass General to 20.

Established as one of three strategic priorities, along with Patient Affordability/Innovation Units and Population Health Management, Care Redesign engages multidisciplinary teams of clinical and process improvement experts at the Mass General and MGPO to focus on finding ways to improve the quality, efficiency and value of care delivered to our patients.

Founded on a principle of improving quality, safety, value and the experience of care for patients, this effort represents the prescription for success in the rapidly changing health care delivery environment.

Crossing many of the Institute of Medicine’s aims for improvement, the sweeping and ongoing Mass General/MGPO Care Redesign program has been foundational in adopting a shared vision of continuous improvement across the organization and implementing new approaches to providing the best services to our patients.

Care Redesign is one way the Mass General/MGPO is bringing value — through improved quality, improved experience and reduced costs — to patients.
“We have an obligation as one of the nation’s leading academic medical centers to improve and advance the quality of health care, and Care Redesign is one of the Mass General/MGPO’s strategic priorities to achieve this goal.”

Elizabeth Mort, MD, MPH
Senior Vice President, Quality & Safety
Approaching Care Redesign through Process Improvement

The Mass General/MGPO Care Redesign initiative utilizes process improvement methodologies to improve the value of care. With support from the Center for Quality and Safety (CQS) Process Improvement Team—led by Mary Cramer, Senior Director, Process Improvement and Ambulatory Management and Performance, Mass General/MGPO Care Redesign teams follow a structured, cyclical and iterative approach to process improvement, incorporating reliable tools, the Plan-Do-Study-Act cycle and change management concepts. Throughout the Care Redesign cycle, team members learn valuable process improvement skills that they can apply to other quality and patient safety improvement initiatives.

### BASICS* Model

| Blueprint | • Define the target  
| • Develop a scope  
| • Set improvement targets |
| --- | --- |
| Assess | • Understand the process  
| • Map the process  
| • Brainstorm and identify improvement opportunities |
| Suggest | • Brainstorm solutions  
| • Develop test plans  
| • Form teams and identify team leads/process owners |
| Implement & Check | • Communicate pilot plans  
| • Pilot test plans—Plan, Do, Study, Act  
| • Measure, monitor and communicate outcomes |
| Sustain | • Operationalize new process owners  
| • Create “accountability” owner  
| • Identify a venue for results reporting  
| • Report-out on project regularly  
| • Actively monitor and act on outcomes: celebrate successes, make changes when needed, communicate |

*Source: Leveraging Lean in Healthcare. Charles Protzman, George Mayzell, MD, & Joyce Kepcher, Taylor Francis & Group, 2011
“For the foreseeable future, Care Redesign and Patient Affordability, particularly the Innovation Units, will remain among the most important activities at the Mass General/MGPO.”

David F. Torchiana, MD
Chairman and CEO, MGPO
The alignment of Care Redesign and Patient Affordability has been a wonderful strategic effort at this organization. When we think about the interdisciplinary teams coming together to advance the quality and safety of patient care, I believe we are on the forefront of important change.”

Jeanette Ives Erickson, RN, DNP, FAAN
Chief Nurse and Senior Vice President for Patient Care
INTRODUCTION
In early 2010, Partners HealthCare launched a comprehensive strategic planning process to ensure the continued success of Partners entities in the face of national health care reform and a troubling economic climate. The result is a three-pronged approach: care redesign, patient affordability and reputation/communications. Together, these efforts are designed to enhance patient experience, outcomes and value. While the Innovation Units initiative is housed under the heading of Patient Affordability, the link to Care Redesign is clear and undeniable, as evidenced by the Innovation Units strategic goals.

PURPOSE
The aim of the Innovation Units initiative is to establish a platform that allows tests of change that will help quickly identify what works and what does not, so that we may improve the quality of care delivered to our patients. The goals are as follows:

- High performing interdisciplinary teams that deliver safe, effective, efficient, timely, equitable care, that is patient- and family-centered
- Standardization that reduces variation and introduces a systematic approach to improving quality and safety in the inpatient setting
- Identification/prioritization of hazards and opportunities for standardization, with implementation of evidence-based methods to rectify

INNOVATION ROLL-OUT
As of October 2013, the Innovation Units initiative consists of a set of 15 interventions implemented across 41 units. Phase I consists of 12 inpatient units launched 3/19/12; Phase II consists of 25 inpatient units launched 4/1/13; and Phase III consists of 2 inpatient and 2 short-stay units launched 9/24/13. Phase IV will consist of outpatient and procedural areas, with an anticipated launch in 2014.

RESULTS
The evaluation strategy is designed to include both quantitative and qualitative outcomes of the innovation interventions. A new dashboard consolidating quality, safety and financial metrics is available to track performance of key indicators relative to national benchmarks. This work promotes transparency and accountability and highlights best practices.

Early results point to success. While it is still early to report conclusive outcomes from the Phase II Innovation Units, Phase I units have been successful in decreasing average length of stay by 5% and sustaining that decrease over time. After accounting for differences in case mix, direct costs per discharge have declined nearly 3% between FY 2012 Q1 and FY 2013 Q1. Readmissions on Phase I units have decreased from 10% to 9%, while the rest of the inpatient units remained stable. Measures of patient experiences showed improvement on Phase I Innovation Units at twice the rate of other units. Through focus groups, a common theme is that participants feel they are part of an important, positive initiative that improves patient care, relationships with patients and colleagues, patient and staff satisfaction and outcome metrics. They perceive a strong personal role and connection to the Innovation Unit process of transforming care.

NEXT STEPS
Going forward, keen attention will be paid to sustaining Phase I and II interventions and outcomes while continuing Phase III roll-out implementation on remaining inpatient and short stay units. Next, design efforts to launch Phase IV will be conducted (e.g., Dialysis, Oncology Infusion, etc.), which will require a re-examination of the interventions in the outpatient setting. To maximize synergies, the Innovation Unit work will be aligned with the Inpatient Access to Care Committee initiatives and the Care Redesign efforts.
Innovations in Care Delivery: “Patient Journey” Framework

Initial 15 Interventions

**Before**
- Pre-admission care
- Admission process: ED direct admits, transfers

**During**
- Patient stay, direct patient care, tests, treatments, procedures, clinical support, operational support

**After**
- Discharge process
- Post-discharge care

**Goal:** High-performing, interdisciplinary teams that deliver safe, effective, timely, efficient and equitable care that is patient- and family-centered

Discharge planning:
- Est. discharge rate
- Discharge disposition

**Welcome Packet (notebook and discharge envelope)**

Domains of practice
- Daily interdisciplinary team rounds
- Electronic unit whiteboards
- In-room whiteboards
- Smart phones
- Wireless laptop computers/tablets
- Business cards
- Hourly rounding
- Quiet hours

Relationship-based care • The Attending Nurse role • Hand-Over Rounding Checklist

Discharge:
- Follow-up call program

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Intervention Spotlight:  
The Attending Nurse Role

At the heart of the Innovation Unit model is the new attending registered nurse (ARN) role. The ARN functions as a clinical leader, managing the care of patients on a single unit from admission to discharge. This unique position interacts with the interdisciplinary team, the patient and the family to foster continuity, responsiveness, quality, safety, effectiveness and efficiency.

The role requires a dynamic set of individual competencies, knowledge and an approach that is tailored to the particular needs of each patient care unit. Ideal ARN candidates are experienced, highly regarded, inquisitive nurses who are committed to advancing change. They also commit to work schedules designed to promote continuity and relationship-based care for patients, families and care team members alike.

According to Gina Chan, RN, attending nurse on the Bigelow 14 Vascular Surgery Unit, “Being able to follow patients daily and share information with the whole team has improved communication, improved care and, most important, improved patient outcomes.”
**AIM:** To improve the quality of care delivered to our patients, establish a platform that allows tests of change that will help quickly identify what works and what does not.

**Goals:**
1. High performing interdisciplinary teams that deliver safe, effective, efficient, timely, equitable care, that is patient-and family-centered
2. Standardization that reduces variation and introduces a systematic approach to improving quality and safety in the inpatient setting
3. Identification/prioritization of hazards and opportunities for standardization, with implementation of evidence-based methods to rectify

**INTERVENTION:** Set of 15 interventions across 37 units.

**INTERVENTION SPOTLIGHT: ATTENDING NURSE ROLE**
Accountable for **continuity** and progression along the developed overall patient/family plan of care from **admission** to discharge
**AIM:** Research shows that rest improves healing and promotes better clinical outcomes for patients. Improve HCAHPS quietness scores by implementing a unit-based Quiet Times program.

**INTERVENTION:** Quiet Times was integrated into the Innovation Unit initiative. This process included:

- Assessments of units for sources of noise
- Implementation of designated quiet hours and training staff
- Mobilization of constituencies to address other sources of noise
- With other services, additional noise remedies were implemented, including:
  - Wireless devices for communication that reduced paging ([Clinical Support Services])
  - Preventative maintenance on doors and rolling stock ([Buildings and Grounds])
  - Noise reduction connected with pantries and food delivery ([Nutrition and Food Services])
  - Door alarms that were not needed for patient care and safety ([Police and Security])
  - Modification of floor buffing schedules ([Environmental Services])

**RESULTS**

<table>
<thead>
<tr>
<th>Survey Measure</th>
<th>Mass General 2011 Baseline Score</th>
<th>Mass General 2012 YTD</th>
<th>Change YTD</th>
<th>Innovation Units 2011 Baseline Score*</th>
<th>Innovation Units 2012 YTD Score*</th>
<th>Change YTD</th>
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<tbody>
<tr>
<td>Nurse Communication Composite</td>
<td>79.4</td>
<td>80.5</td>
<td>+1.1</td>
<td>76.3</td>
<td>80.5</td>
<td>+4.2</td>
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<td>Doctor Communication Composite</td>
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<td>-0.48</td>
<td>1.58</td>
<td>1.8</td>
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<td>Room Clean</td>
<td>69.8</td>
<td>72.8</td>
<td>+3.0</td>
<td>66.4</td>
<td>70.5</td>
<td>+4.1</td>
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<td>Quiet at Night</td>
<td>45.2</td>
<td>48.4</td>
<td>+3.2</td>
<td>43.6</td>
<td>50.2</td>
<td>+6.6</td>
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<td>Cleanliness/Quiet Composite</td>
<td>57.5</td>
<td>60.6</td>
<td>+3.1</td>
<td>55.0</td>
<td>60.4</td>
<td>+5.4</td>
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<td>Staff Responsiveness Composite</td>
<td>63.6</td>
<td>64.8</td>
<td>+1.2</td>
<td>62.3</td>
<td>63.6</td>
<td>+1.3</td>
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<td>Pain Management Composite</td>
<td>71.5</td>
<td>71.8</td>
<td>+0.3</td>
<td>69.6</td>
<td>73.7</td>
<td>+4.1</td>
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<td>Communication About Meds Composite</td>
<td>62.7</td>
<td>64.1</td>
<td>+1.4</td>
<td>58.9</td>
<td>65.6</td>
<td>+6.7</td>
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<tr>
<td>Discharge Information Composite</td>
<td>89.8</td>
<td>91.3</td>
<td>+1.5</td>
<td>89.6</td>
<td>92.2</td>
<td>+2.6</td>
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<td>Overall Rating</td>
<td>79.1</td>
<td>79.9</td>
<td>+0.8</td>
<td>76.1</td>
<td>78.8</td>
<td>+2.7</td>
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<tr>
<td>Likelihood to Recommend</td>
<td>89.4</td>
<td>90.4</td>
<td>+1.0</td>
<td>87.9</td>
<td>90.6</td>
<td>+2.7</td>
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</tbody>
</table>

*HCAHPS Data for Innovation Units includes 6 units for which data is available: Bigelow 14, Blake 13, Ellison 16, Lunder 9, White 6 and White 7 as of November 18, 2012. Data not available for ICUs and Psych.

**TEAM:** Mass General Patient Care Services, Buildings and Grounds, Nutrition and Food Services, Police and Security, Environmental Services

**The following inpatient units:**

- Bigelow 14 Vascular Surgery
- Blake 11 Psychiatry
- Blake 13 Newborn Family
- Ellison 6 Orthopedics
- Ellison 10/11 Cardiology
- Ellison 13 Obstetrics
- Ellison 16 Medicine
- Ellison 17/18 Pediatrics
- Lunder 9 Oncology
- Phillips 21 Gynecological Oncology
- White 6 Orthopaedics/Oral Maxillofacial/Urology
- White 7 General Surgery

**CONCLUSIONS**

By December 2012, an overall improvement of more than 6.4 points on Mass General’s HCAHPS quietness scores was achieved for the units that implemented Quiet Times. This is a significant improvement — especially given Mass General’s acuity, volume and double-bedded rooms. Anecdotal reports for units without HCAHPS data were also positive.

**NEXT STEPS**

- Practice should become permanent and standardized throughout the hospital
- Research on possible correlation of quietness scores with length of stay and other clinical outcomes, as well as the impact of quiet times on nursing job satisfaction, should be conducted
Patient Care Services Innovation Unit Evaluation at Mass General

**SCOPE:** A broad approach to data collection and evaluation of the Mass General Innovation Units’ initiatives with the ability to provide specificity as needed; use a 90-day cycle to collect, analyze and report qualitative and quantitative outcomes including cluster areas of patient engagement, communication, roles and structures.

**INTERVENTIONS**

**Throughout Admission**
- Relationship-Based Care
- Attending Nurse
- Handover Rounding Checklist

**Pre-Admission**
- Pre-Admit Data Collection
- Welcome Packet
- Post-Discharge
- Discharge Follow-up Phone Calls

**During Admission**
- Domains of Practice
- Interdisciplinary Rounds
- Business Cards
- Quiet Hours
- Hourly Rounding
- Electronic Whiteboards
- In-Room Whiteboards
- Smart Phones
- Handheld/Tablets

**SELCT QUANTITATIVE FINDINGS**

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<tr>
<th></th>
<th>Baseline</th>
<th>Innovation</th>
<th>Change</th>
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<tr>
<td><strong>Average LOS (days)</strong></td>
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<td></td>
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<tr>
<td>Phase I Innovation</td>
<td>5.5</td>
<td>5.2</td>
<td>-5%</td>
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<tr>
<td>TOTAL MASS GENERAL</td>
<td>5.9</td>
<td>5.9</td>
<td>0%</td>
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<tr>
<td><strong>30-Day Readmit Rate (% of admits)</strong></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Phase I Innovation</td>
<td>9.9%</td>
<td>9.0%</td>
<td>-0.9</td>
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<tr>
<td>TOTAL MASS GENERAL</td>
<td>11.3%</td>
<td>11.1%</td>
<td>-0.2</td>
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**EVALUATION SCHEMA/METRICS**

**Quantitative**
- HCAHPS
- LOS
- Readmissions
- Leadership Influence over Professional Practice Environments (LIPPS)
- Quality Indicators
- Patients Perceptions of Feeling Known (PPFKN)
- Cost per Case Mix Adjusted Discharge
- Staff Retention
- INPATIENT DIRECT COST PER CASE MIX ADJUSTED DISCHARGE

**Qualitative**
- Focus Groups (Staff, Patients, Families, etc)
- Observations
- Survey of the Innovation Unit Expectations (pre)
- Survey of the Innovation Unit Experiences (post)
- Participants had genuine excitement about being part of the Innovation Units and were putting a lot of work into preparation. While there were clear challenges articulated, particularly around getting staff buy-in, there were resources and strategies in place to address these challenges. Participants seemed to feel that they were part of an important positive initiative that would improve patient care, relationships with patients and colleagues, patient and staff satisfaction and outcome metrics. They perceived a strong personal role in and connection to the process.

**NEXT STEPS**
- Sustain Phase I interventions and outcomes
- Continue Phase II; launch Phases III and IV

**ADDITIONAL EVALUATION MEASURES**
- Role shadowing (observation) on units
- Analyze observation checklist results
- Survey experiences
Interest and Recognition for the Mass General Innovation Units

The Innovation Unit work has begun to attract national interest and has been featured in the documentary “NURSES: If Florence Could See Us Now,” recognized by the Robert Wood Johnson Foundation’s “Transitions to Better Care” video contest. It has also been reported in a variety of publications, including “Nurse Leadership from Bedside to Boardroom,” Patient Safety & Quality Healthcare; “Attending Registered Nurse, an Innovative Role to Manage Between the Spaces,” Nursing Economics; “Nurses Leading Through Innovation,” The American Nurse; and “‘Innovation Advisers’ Chosen for Ideas to Improve Health Care, Cut Costs,” The Washington Post. In October of 2013, the Mass General Innovation Unit initiative was presented at the American Nurses Credentialing Center’s National Magnet Meeting (Orlando, FL), and was the basis of the symposium entitled, “Innovation in Care Delivery: Advancing a Professional Practice Environment,” presented by Mass General’s Institute for Patient Care.
“Through Care Redesign, we have clinicians and staff across the institution looking critically at how to make care for our patients better and more affordable at the same time. Care Redesign is critical to what I hope will be the legacy of the Mass General 50 years from now.”

Peter L. Slavin, MD
President, Massachusetts General Hospital
Mass General/MGPO Care Redesign Impact Snapshot: Examples of Teams Bringing **Value** to Patient- and Family-Centered Care

**Improving the Quality of Care**

**Arthroplasty Care Redesign Team**
- Decreased patients length of stay

**Neuroendovascular Team**
- Decreased patients length of stay

**Total Joint Replacement Procedures**

<table>
<thead>
<tr>
<th>Fiscal Year</th>
<th>Volume</th>
<th>ALOS Total</th>
<th>ALOS EXCELerated</th>
<th>ALOS Traditional</th>
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<tbody>
<tr>
<td>FY11 Q1-02</td>
<td>3.93</td>
<td>3.88</td>
<td>3.56</td>
<td>3.75</td>
</tr>
<tr>
<td>FY11 Q3-02</td>
<td>3.75</td>
<td>3.74</td>
<td>3.24</td>
<td>2.65</td>
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</table>

**Improving the Experience of Care**

**Arthroplasty Care Redesign Team**
- Increased patient satisfaction

**Neuroendovascular Team**
- Coordinated provider communication

**Percent of Notes Containing EDD or EDT**

- FY11 Q1-Q2: 2.65%
- FY11 Q3-Q4: 3.88%
- FY12 Q1-Q2: 3.24%
- FY12 Q3-Q4: 3.93%
- FY13 Q1-Q2: 3.75%

**Reducing the Cost of Care**

**Premature Neonate Team**
- Reduced utilization of high-cost resources

**Inpatient Psychiatry Team**
- Improved efficiency by reducing time to treatment

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Launched at Partners HealthCare: October 2010
Launched at Mass General/MGPO: April 2011

- Colon Cancer
- Primary Care
- Coronary Artery Disease: Coronary Artery Bypass Grafting (CABG) and Acute Myocardial Infarction (AMI) *(See pages 53–54 for the AMI Care Redesign Team overview)*
- Diabetes Mellitus
- Stroke
Colon Cancer Care Redesign

**AIM:** Work with a cross-Partners team to redesign colon cancer care for the surgery-related phase, beginning with diagnosis and ending 30 days post-colectomy

**INTERVENTIONS**

- Developed a standardized surgical pathway for the colectomy procedure, including standardized checklists and protocols for pre-, intra- and post-operative care. Laparoscopic colectomy recommended for patients meeting guidelines due to increased quality and decreased cost.
- Worked with Mass General Cancer Center’s Patient and Family Advisory Council to develop educational materials and a patient booklet that features information about preoperative preparation and discharge expectations.
- Assigned a nurse practitioner specializing in colon cancer to review the educational materials with patients before surgery and conduct postdischarge calls.
- Developed a pre-colectomy imaging protocol.
- Developed an algorithm to direct patients to a multidisciplinary cancer care team after surgery.
- Created standards for administration of chemotherapy and surveillance guidelines by stage.

**COLORECTAL SURGERY FOR TREATMENT OF COLON CANCER VALUE DASHBOARD 1.2**

| Diagnosis: | Inpatients diagnosed with malignant cancer of the colon undergoing colorectal surgery |
| Reporting Period: | FY11 Oct 2010 – Sep 2011 (except where otherwise stated) |

<table>
<thead>
<tr>
<th>MEASURES</th>
<th>DATA SOURCE</th>
<th>MASS GENERAL</th>
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<td><strong>OUTCOMES</strong></td>
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<tr>
<td>Returns to Hospital</td>
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<td>30-Day Readmission Rate. All Cause</td>
<td></td>
<td>7.2%</td>
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<td>Observed (N)</td>
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<td>9</td>
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<td>ED Visit within 30 Days of Discharge, All Cause</td>
<td>UHC</td>
<td>1.6%</td>
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<td>Observed (N)</td>
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<tr>
<td>Resource Use</td>
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<tr>
<td>Average Nursing Acuity Per Patient Day</td>
<td>TSI/EPSi</td>
<td>1.7</td>
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<tr>
<td>Average Length of Stay (Risk Adjusted)</td>
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<td></td>
</tr>
<tr>
<td>Index [Observed/Expected Ratio]</td>
<td>UHC</td>
<td>0.8</td>
</tr>
<tr>
<td>Observed [Days]</td>
<td></td>
<td>6.3</td>
</tr>
</tbody>
</table>

**TEAM LEADERS**

Mara Bloom
Theresa McDonnell, NP
David Rattner, MD
David Ryan, MD

**CONCLUSIONS**

- Determined that pre-visit workup (imaging order set) should be facilitated by the MD practice rather than cancer access nurse as initially recommended. Access Nurse role is better utilized at time of medical oncology visit.
- Standardization of surgical instrumentation helped to reduce cost per surgical case.
- Identified that review of education materials and compact by the Colorectal NP could be the greatest value-add for patients.

**NEXT STEPS**

- Continue to monitor the value dashboard.
- Mass General has lowest LOS and highest acuity across PHS.
- 14.6% increase in lap cases between Q1–2 2011.
- Mass General costs have been lowest historically, but increase in cost/case since 2010 — evaluating drivers.
“The Cancer Center is fortunate to have a Patient and Family Advisory Council, which was an integral part of the Colon Cancer and Lung Cancer Redesign Teams. Family members were included as members of each team and actively participated in the redesign process.”

Mara Bloom
Administrative Lead, Cancer Center Care Redesign Teams
Primary Care Care Redesign Team

**AIM:** Complete Patient Centered Medical Home (PCMH) Transformation in Primary Care
- Achieve formal PCMH recognition
- Achieve meaningful change in our practices that will allow all of primary care at Mass General to deliver the highest quality care and service, at a lower cost
- Enhance the work life of the physicians and staff that will enable Mass General to attain and retain the best primary care workforce in the country
- Enhance the spectrum of services delivered in our primary care practices
- Enhance coordination and collaboration with Specialty care services
- Improve access to both primary and specialist care services at Mass General

**INTERVENTIONS**

**CARE OF CHRONIC CONDITIONS AND PREVENTIVE SERVICES**
- Implement Diabetes: implement protocols for insulin initiation and titration recommended by Partners and Mass General Diabetes Care Redesign Group
- Implement changes in medical assistants role related to preventive care visits
- Implement new guidelines for opioid therapy

**COORDINATION OF CARE/HIGH RISK**
- Implement monthly multidisciplinary practice meetings to review of patients seen in ED frequently
- 75% of patients discharged from Medical service to home have post-discharge follow-up within 4 days

**NEXT STEPS**
- Planned management of chronic disease
  - Intervention aligned with IPF goals for depression
- Coordination of care
  - Implement processes to coordinate referrals
- Access and continuity
  - Implement standard protocols for nurse triage

**GOALS FOR 2013–14**
- Continue down path of actual care redesign
  - Move from process measures into clinical practice
- Continue training initiatives
  - Medical assistants: flow training
  - Leadership training
- Pilot innovations in care delivery and compensation models
  - Virtual visits
- Achieve PCMH recognition
Cardiac Surgery Services (CSS)-Process Improvement/CABG Care Redesign: Comprehensive Cardiac Surgery Pre-Operative Clinic

AIM
- To create a comprehensive cardiac surgery pre-operative clinic in order to increase same-day admissions and streamline the patient journey for cardiac surgery patients

INTERVENTIONS
- Designed and launched a cardiac surgery pre-op clinic
- Established anesthesia and surgical training for NP/PA staff in order to offer a comprehensive NP/PA-led pre-operative evaluation
- Developed standard clinic guidelines for
  - Consultation with anesthesia
  - Further patient evaluation
  - Pre-surgery medication

RESULTS

CONCLUSIONS
- Reduced pre-op length of stay and associated costs and increased bed availability
- Reduced anesthesia demand by one FTE, allowing for enhanced anesthesia flexibility for Heart Center coverage
- Reduced duplicative work for clinicians and repetitive questions asked of patients
- Improves flexibility for out-of-town patients
- Provides more consistent delivery of care

NEXT STEPS
Explore further expansion of the cardiac surgery pre-operative clinic
AIM: To improve the safety, quality, and efficiency of cardiac surgical care by implementing a system for multidisciplinary communication and the development of an individualized care plan for each patient

INTERVENTIONS
• Established consistent time, format and content for the pre-op briefing
• Built upon WHO requirements
• Established multidisciplinary membership for pre-op briefing attendance
• Changed weekly surgical division meeting to accommodate surgeon presence
• Designed and built a reusable, tempered glass frame for briefing poster to facilitate interactive conversation

RESULTS

CONCLUSIONS
• Improves communication and safety
• Empowers team members to speak up
• Reduces equipment delays
• Enhances educational opportunity
• Facilitates mid-case staff handoffs

NEXT STEPS
• Adopt as standard clinical practice
• Develop structured de-briefing system
AIM: To improve surgical incision on-time starts (8:20am) in the cardiac surgery OR suite to 75% by eliminating waste, reducing unnecessary variation and clarifying roles, responsibilities and accountabilities for all team members.

INTERVENTIONS

- Established workflow goal times
- Launched multidisciplinary Daily Operations Team (DOT) to monitor progress and ensure “plan for the day”
- Debriefed delay reasons daily and aggregated monthly
- Provided surgeons and anesthesiologists with personal on-time start data monthly
- Provided immediate feedback to staff
- Standardized patient prep
- Increased coordination with CPC
- Created OR management team

RESULTS

CONCLUSIONS

- Goal of 75% on-time incision starts is attainable
- Increased ability to plan for the day
- Improved communication and collaboration among role groups — success was due to the involvement of all role groups
- Noticeable decline in performance over the summer prompted team to examine and address root causes
- Sustaining change is challenging

NEXT STEPS

- OR management team to monitor process
- Continually reinforce interventions with all role groups
**AIM:** To develop a population management approach to the care of patients with diabetes that incorporates lifestyle change and targets behavioral barriers starting with safe and effective insulin use

**INTERVENTION**

Developed a standard team-based process, supported by a handbook that incorporates behavioral, lifestyle and medical tools

- Established diabetes champion physician and nurse role and supported implementation at three sites
- Mass General Department of Nutrition committed to integrating practice-based dietitian as care team members
- Supported TopCare development

**RESULTS**

Diabetes Care Redesign Team

**PROCESS OWNER(S)**

Mira Kautzky, MD (IMA)
Zoila Doherty, RN (IMA4)
Kerry Cafasso, NP (WHA)
Susan Ross, RN (Mass General BB)

and their respective practices

Marcy Bergeron, ANP (BMG)
Linda Delahanty, MS, RD (Mass General Diabetes Center)
Melanie Pearsall, RD (Revere)
Anne Thorndike, MD (Cardiac Rehab/Metabolic Syndrome Clinic)

**TEAM LEADERS**

Deborah Wexler, MD, MSc (Mass General Diabetes Center)
Stephanie Eisenstat, MD (Primary care-Women’s Health Associates)

**PROJECT SPONSORS**

Eric Weil, MD
Sally Iles, RN

**CONCLUSIONS**

This model-teaming a diabetes champion nurse care manager with the primary care provider and a practice-affiliated dietitian based within the PCMH-improved the quality and efficiency of insulin use.

- HbA1c reduction -2.49 SD (3.09) among patients initiating insulin
- No severe hypoglycemia (5% rate of mild hypoglycemia) and weight neutral
- Oral diabetes agent use reduced, along with LMR intervention targeting high-cost diabetes drugs
- Nutrition utilization 33% (range 20-50%)

**NEXT STEPS**

- Diabetes team care model being implemented at all Mass General primary care practices in 2013
- Team-based training conferences in May and October 2013 covered medical, lifestyle and behavioral content and facilitated team workflow development
- Expand model to cover other diabetes care processes
“Diabetes is a condition that spans across the institution, so it was very important for Diabetes Care Redesign Team to pull together a broad, multidisciplinary team — we engaged specialists, primary care physicians, nurses, dietitians and pharmacists and worked to design a comprehensive system of care for our diabetic patients.”

Deborah Wexler, MD
Physician Co-Lead, Diabetes Care Redesign
Stroke Care Redesign Team

**AIM:** To improve our discharge readiness by improving communication between team members about remaining in-hospital treatment before discharge.

**TEST**

1. **Our first test** of change established a discharge readiness tool with checklist-driven guidelines to transparently share responsibility for the discharge experience across the care team and minimize avoidable delays. We quickly found out we needed to refine the process, understanding that documentation was meaningful for the workflow and that the discharge process was driven mainly by the structure of multidisciplinary rounds.

2. **Our second test** of change aligned a discharge readiness checklist to a resident-led round checklist used during multidisciplinary work rounds. To improve the process further, we developed a universal interdisciplinary progress note and ensured training/education took place at each service rotation.

**RESULTS**

**Education:** Attendings’ edits are an opportunity to review areas of misunderstanding as documented by the juniors, and the note provides an educational guide to important metrics for our patients.

**Reduce Redundancy:** The note is used to generate sign-outs, resident progress notes and attending progress notes with the intent of collapsing three processes into one application.

**Improved Patient Care:** Embedded checklists aim to ensure that important aspects of patient care are not overlooked.

**Improved Communication:** This note is the “go-to” note for all MDs, and aims to improve communication among teams.

**Documentation:** This note satisfies documentation requirements for Joint Commission and other regulatory bodies, and ensures billing compliance without requiring new documentation.

**CONCLUSIONS**

The tools have been adopted by the medical team and are embedded in the daily workflow.

**NEXT STEPS**

- The work developed and implemented through the Innovation Units has contributed to improving our patients’ discharge readiness
- The new care coordinators’ role should help in improving the discharge process and our patients’ satisfaction
Stroke Care Redesign: Transient Ischemic Attack (TIA) Initiative

**AIM:** We evaluated the effect of a ED-based rapid TIA evaluation protocol on the provision of care concordant with a system-wide TIA guideline that was developed in a multi-hospital collaborative QI project. The aim of this initiative was:

- To evaluate adherence to Partners TIA management protocol
- To determine whether TIA patients are being evaluated and triaged according to established guidelines

**TEST**
We included 89 consecutive patients in pre-intervention (2012) and 72 in post-intervention (2013) phases from 2 tertiary and 1 large community hospitals. Patient evaluations and disposition were compared to an evidence-based TIA protocol, which determined ED discharge vs. inpatient admission based on imaging results, ability to comply with follow-up and ABCD2 score (admit if 6-7; outpatient follow-up <5d if 2-5 or <7d if 0-1). Univariate and multivariable models explored factors associated with concordant care.

**RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>Pre-Intervention (n=89)</th>
<th>Post-Intervention (n=72)</th>
<th>P-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABCD2 Score 0 – 1</td>
<td>6.1%</td>
<td>11.9%</td>
<td></td>
</tr>
<tr>
<td>ABCD2 Score 2 – 5</td>
<td>84.1%</td>
<td>74.6%</td>
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<tr>
<td>ABCD2 Score 6 – 7</td>
<td>9.8%</td>
<td>13.4%</td>
<td></td>
</tr>
<tr>
<td>Use of unenhanced CT</td>
<td>65.2%</td>
<td>59.7%</td>
<td>0.519</td>
</tr>
<tr>
<td>&gt; 1 TIA episodes</td>
<td>25.8%</td>
<td>13.9%</td>
<td>0.078</td>
</tr>
<tr>
<td>Medically Unstable</td>
<td>9.0%</td>
<td>4.2%</td>
<td>0.348</td>
</tr>
<tr>
<td><strong>Concordant Care</strong></td>
<td><strong>48.3%</strong></td>
<td><strong>75.0%</strong></td>
<td><strong>0.001</strong></td>
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<tr>
<td>Admitted when recommended admit</td>
<td>25.8%</td>
<td>23.6%</td>
<td>0.855</td>
</tr>
<tr>
<td>Admitted when recommended d/c</td>
<td>59.6%</td>
<td>37.5%</td>
<td>0.007</td>
</tr>
<tr>
<td>Discharged when recommended d/c</td>
<td>12.4%</td>
<td>36.1%</td>
<td>0.001</td>
</tr>
<tr>
<td>Discharged when recommended admit</td>
<td>2.2%</td>
<td>2.8%</td>
<td>0.830</td>
</tr>
<tr>
<td>Imaging findings noted in dispo decision</td>
<td>20.2%</td>
<td>38.9%</td>
<td>0.014</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**
Implementation of a rapid TIA evaluation protocol increased care concordant with system-wide guidelines, particularly in increasing the percent of patients avoiding unnecessary admission.

**NEXT STEPS**
- Submission of abstract to International Stroke Conference
- Publication of paper(s) detailing data and analysis
Launched at Mass General/MGPO: April 2011

- Arthroplasty
- Lung Cancer Care
- Neuroendovascular
- OB/Vaginal Delivery
- Transplant
The Arthroplasty Care Redesign Team designed and implemented the EXCELerated Recovery Joint Replacement Program, which followed several guiding principles:

- Maintain highest levels of patient care, quality and outcomes
- Improve patient satisfaction through new educational materials and increased care coordination
- Streamline workflows

Key features of the program included: early mobilization, standardized medical management, enhanced care coordination, and patient-centered care.

The EXCELerated Recovery Joint Replacement Program led to a 16% overall reduction in ALOS (850+ days saved/year) and a 26% reduction in ALOS in EXCELerated Recovery patient population, 16% increase in volume (200+ cases added/year), and 19 days/year PACU recovery time saved. In addition to decreasing length of stay and recovery time, the Arthroplasty Care Redesign Team focused on patient experience, and measured a 6% increase in overall hospital rating HCAHPs score for their patients.

Coordination and communication with patient and entire team were also improved.

TEAM MEMBERS

Andrew Freiberg, MD
Robert Peloquin, MD
Lauren Lebrun
David Gaynor
Greg Pauly
Bonnie Chabra
Mary Cramer
Bethany Daily
Robert Dorman, PT, DPT, GCS
Janet M. Dorrwachter, NP
Brianna Germain
Nan M. Jones
Wilton Levine, MD
Lara J. Lind
Teresa O. MacDonald, RN
Kelsey McCarty
Emily Mula, NP
Logan Sharma, OT,
Maryellen O’Dea
Jill A. Pedro, RN
Arun S. Shanbhag, PhD, MBA
Pamela J. Tobichuk, RN
James Rathmell, MD
Elizabeth Jacob

“We looked at patient satisfaction closely throughout the entire Care Redesign process and, overall, we found patients were very satisfied with their care and were excited to be a part of the EXCELerated Joint Replacement Program.”

Lauren Lebrun
Administrative Lead, Arthroplasty Care Redesign Team

Members of the Arthroplasty Care Redesign Team following the completion of the team’s Patient Education video shoot
**Arthroplasty Care Redesign: EXCELerated Recovery Program**

**AIM:** The ACR team will reduce cost, optimize the clinical pathway and improve patient care and satisfaction. The team is focused on total hip and knee replacement procedures from the initial office visit to discharge from the hospital.

**PROGRAM DESIGN**
- Designed and implemented the EXCELerated Recovery Joint Replacement Program
- Implemented new patient education materials setting recovery and LOS expectations prior to surgery
- Developed post-op orders for EXCELerated Recovery patients in POE.
- Utilized new anesthesia management protocols
- Designed automated weekly program candidate report using Case Management, PATCOM and OR systems
- Implemented early patient mobilization program
- Utilized patient pathway materials

**RESULTS**

**CONCLUSIONS**
- Setting patient expectations leads to shorter length of stay
- Coordination and communication with patient and entire team have improved
- 16% overall reduction in ALOS (850+ days saved/year); 26% reduction in ALOS in EXCELerated Recovery patient population
- 16% increase in volume (200+ cases added/year)
- 19 days/year PACU recovery time saved
- Six IRB submissions complete/in-progress
- National conferences and academic publications

**NEXT STEPS**
- Continue to closely monitor LOS
- Continue to educate staff on new processes
- Explore Post-Acute Care Management
- Explore options for expanding the patient population going directly to outpatient physical therapy

**TEAM LEADERS**
Andrew Freiberg, MD
Lauren Lebrun
Robert Peloquin, MD

**EXECUTIVE SPONSOR**
Greg Pauly

**PROJECT SUPPORT**
Mass General/MGPO Process Improvement
Clinical Decision Support Unit
Clinical Care Management Unit
Laboratory of Computer Science

**TEAM MEMBERS**
Bonnie Chabra
Mary O. Cramer
Bethany Daily
Bob Dorman, PT, DPT, GCS
Janet M. Dorrwachter, NP
David C. Gaynor
Brianna Germain
Nan M. Jones
Wilton Levine, MD
Lara J. Lind
Teresa O. MacDonald, RN
Kelsey McCarty
Emily Mulla, NP
Logan Sharma, OT
Maryellen O’Dea
Jill A. Pedro, RN
Arun S. Shanbhag, PhD, MBA
Pamela J. Tobichuk, RN
Arthroplasty Care Redesign: Anesthesia Spinal Dose Reduction

**AIM:** The ACR team will reduce cost, optimize the clinical pathway and improve patient care and satisfaction. The team is focused on total hip and knee replacement procedures from the initial office visit to discharge from the hospital.

**REASONING**
- Anesthesia time lasts longer than surgical time indicating patients receive more anesthesia than necessary.
- Linked with prolonged PACU recovery time limiting early patient mobilization following surgery.
- National benchmarking suggests average spinal dose is 6 mg-12 mg.

**STUDY**
- Study and implement reduced dose spinal anesthetics with surgeons and anesthesiologists.

**RESULTS**

**Average Dose of 0.5% Bupivacaine For Spinal Arthroplasties in 2011 and 2012 by Quarter**

<table>
<thead>
<tr>
<th>Quarter</th>
<th>Average Dose of 0.5% Bupivacaine (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1 2012</td>
<td>Hips: 16.4, Knees: 14.9, All: 15.4</td>
</tr>
<tr>
<td>Q2 2012</td>
<td>Hips: 16.4, Knees: 14.5, All: 15.3</td>
</tr>
<tr>
<td>Q3 2012</td>
<td>Hips: 15.5, Knees: 12.6, All: 14.9</td>
</tr>
<tr>
<td>Q4 2012</td>
<td>Hips: 14.9, Knees: 15.1, All: 14.1</td>
</tr>
</tbody>
</table>

**CONCLUSIONS**
- Reduced average spinal dose from 18 mg to 14 mg.
- Reduction of PACU recovery time by 27,428 min (457 hours or 19 days).

**NEXT STEPS**

New IRB submission studies in progress:
1. Developing a dose-response curve for 0.5% Bupivacaine
2. Randomized, blinded study of high v. low spinal doses
3. Effect of TXA administration on recovery from total hip and knee replacements.
4. Ultrasound guided lateral femoral cutaneous, femoral and obturator nerve blocks on postoperative pain control and recovery time of patients undergoing total hip arthroplasty.
5. Continuous spinal anesthesia for total knee and hip replacements.
National Recognition for Arthroplasty Care Redesign Team

**PUBLICATION**


*Reducing Joint Replacement Length of Stay at Mass General*

**ORAL PODIUM PRESENTATION**


Assessing Validity and Improving Sensitivity of the Risk Assessment and Prediction Tool in Total Hip and Knee Arthroplasty.

**POSTER PRESENTATIONS**

Orthopaedic Research Society; San Antonio, TX.

Assessing Validity and Improving Sensitivity of the Risk Assessment and Prediction Tool in Total Hip and Knee Arthroplasty.

Massachusetts General Hospital - Clinical Research Day; Boston, MA.

Assessing Validity and Improving Sensitivity of the Risk Assessment and Prediction Tool in Total Hip and Knee Arthroplasty.

American Academy of Orthopaedic Surgeons; Chicago, IL.

The Value of Using the Risk Assessment and Prediction Tool in Planning Care after Total Hip and Knee Arthroplasty.

American Academy of Orthopaedic Surgeons; New Orleans, LA.

Short-Term Outcomes and Cost of Fast-Track Surgery for Total Hip and Knee Arthroplasty at a Tertiary Hospital.

American Association of Hip and Knee Surgeons; Dallas, TX.

Short-Term Outcomes and Cost of Fast-Track Surgery for Total Hip and Knee Arthroplasty at a Tertiary Hospital.

Massachusetts General Hospital - Clinical Research Day; Boston, MA.

Short-Term Outcomes and Cost of Fast-Track Surgery for Total Hip and Knee Arthroplasty at a Tertiary Hospital.
Orthopaedic Innovation Project: Operations Improvement Teams

VISION: Build a culture and perioperative system supporting Great care, On time, Every time for the Lunder 3 perioperative unit

PROJECT OVERVIEW: Through the Orthopaedic Innovation Project, a series of successful interventions have been put into place over the last two years. In the current phase of work (March 2013 to present), a focus has been placed on the following areas and interdisciplinary work teams have been formed.

- Improve intra-DOS processes related to adjustments to the OR schedule
- Improve and streamline patient pre-op processes that occur on the day of surgery
- Improve DOS equipment and instrumentation processes
- Define ideal workflows for ambulatory and non-ambulatory turnovers utilizing simulation models to test

SELECTED WORK TEAM INTERVENTIONS

- **Day of Surgery Scheduling Team:** Standardize communication between Lunder 3, Gray Desk and CSPS; Redesign management of trauma waitlist cases; Stagger first cases based on case type and staffing
- **Day of Surgery Pre-Op and Patient Prep Team:** Standardize information in surgeons’ offices; Encourage use of One Medical Passport prior to PATA appointment; Streamline patient flow from CPC to Lunder 3 Periop
- **Day of Surgery Equipment and Instrumentation:** Provide formal in-service training for multidisciplinary team; Implement day prior to surgery equipment/instrumentation meeting; Implement tray system to reduce holes in wrappers
- **Day of Surgery Turnover Process Team:** Develop ideal state work flow — operating room assistants help with opening instruments; Define set time to be back in rooms; Utilize peel pack bins; Improve team communication led by circulating nurse

RESULTS/TIMELINE (IN PROGRESS)

**Average Turnover Minutes - Monthly Data**

<table>
<thead>
<tr>
<th>Month</th>
<th>Avg Turnover Minutes</th>
<th>Goal = 30 Mins</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY12</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Oct-12</td>
<td>43</td>
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<td>Nov-12</td>
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<td>Dec-12</td>
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<td>Apr-13</td>
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<tr>
<td>Aug-13</td>
<td>44</td>
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</tr>
<tr>
<td>Sep-13</td>
<td>44</td>
<td></td>
</tr>
</tbody>
</table>

**Timeline: Work Teams Formed, Pilot Plans/Recommendations, Pilots (In Progress), Hardwire into daily operations**

TEAM LEADERS

- Evelyn Abayyah
- Jim Barone, RN
- Eddie Belmar
- Lauren Lebrun
- Wilton Levine, MD
- Jason Lewis, MD
- Maryellen O’Dea
- Mark Vrahas, MD

CONCLUSIONS AND NEXT STEPS

- Engaged interdisciplinary teams totaling more than 40 members from Anesthesia, CSPS, Nursing and Ortho Surgery resulted in thoughtful and innovative solutions to day-to-day challenges in the perioperative environment
- The interventions are currently in pilot mode and there are plans to hardwire successful pilots into daily operations beginning September 2013
- Continue to monitor quality, safety and efficiency data
This data set reflects how we perform on the timely administration of prophylactic antibiotics for Lunder 3 orthopaedic patients. Cases are considered appropriate if antibiotics are administered within 1 hour prior to incision (2 hours for vancomycin or fluoroquinolones) or if there is appropriate documentation indicating the need to delay or avoid antibiotics. The goal of prophylaxis is to establish bactericidal tissue and serum levels at the time of incision.

Source: Lunder 3 Manual Audits  Contact: Mark Vrahas, MD

The above data reflects the average monthly percent on time patient arrival into the operating room or at or before the scheduled case time. Our goal for this metric is 90% on time.

Contact: Evelyn Abayaah

% Equipment Request Received 5 Days Prior to Surgery - Monthly Data (Lunder 3 only, excludes weekends and holidays)

Source: Advisory Board Surgical Compass  Contact: Evelyn Abayaah


% % Equipment Request Received 5 Days Prior to Surgery  Goal=90%

Our Equipment and Instrumentation teams rely on accurate and timely equipment forms in order to appropriately match surgeon preference cards to the case, and ensure instruments and implants are ready for each case.

Source: Lunder 3 Manual Audits  Contact: Mark Shakes, MD

Scheduling regional blocks is important for our nursing and anesthesia teams to plan ahead for patient needs, ensure appropriate staff are available and prevent case delays.

Source: Lunder 3 Periop Nursing Audits  Contact: Laura Cameron, RN and Lisa Warren, MD

Scheduling regional blocks prior to surgery - Quarterly Data

Goal = 90%

The rate at which we flash sterile instrumentation, known as Immediate UseSterilization (IUS), gives us insight into the availability of instrumentation throughout the day. Although there is no national benchmark for IUS, the Joint Commission, CMS, and AORN recommend minimal use for infection control prevention. For our purposes, a goal of 10% or lower has been set for this metric.

Source: Lunder 3 Flashing Log  Contact: Eddie Belmar, Mary Sinclair-Dumais

% Flashes  Goal = 10%
The Lung Cancer Care Redesign Team set out to reduce overall costs of non-small-cell lung cancer care, stages I – III, by adhering to standard protocols based on guidelines from the National Comprehensive Cancer Network (NCCN) and American College of Chest Physicians (ACCP).

The team developed practice standards based on National Comprehensive Cancer Network (NCCN) and American College of Chest Physicians (ACCP) guidelines in six areas:

- **Lymph Node Sampling**: Ensure collection of at least three mediastinal (N2) lymph node stations during the time of lobectomy
- **Mediastinal Staging**: Ensure mediastinoscopy utilization meets clinical appropriateness guidelines
- **Open vs. VAT Lobectomy**: Utilize minimally invasive VATs procedure for small tumors; track utilization of each procedure
- **Chemotherapy**: Ensure care is standardized to 4 regimens rather than 7
- **IMRT**: Ensure utilization meets clinical appropriateness guidelines without compromising ability to provide industrialized, high-precision therapy
- **Imaging Surveillance**: Ensure CT scans are performed according to a standardized timetable

The Lung Cancer Team also incorporated the patient voice into its Care Redesign project by soliciting input from patients on the proposed practice changes.

**TEAM MEMBERS**

Jennifer Temel, MD  
Michael Lanuti, MD  
Theresa McDonnell, DNP, ACNP-BC  
Mara Bloom  
Colleen Channick, MD  
Matthew Gilman, MD  
Rebecca Heist, MD  
Henning Willers, MD  
Inga Lennes, MD  
Mari Mino-Kenudson, MD  
Barbara Cashavelly, RN  
Marian Jeffries, RN  
Michele Myers, RN  
Lourdes Barros, MSW  
Peter Dowling, RN  
Jeanne Vaughn, NP  
Mark Scheel  
Elizabeth Souza, RN  
David Miller, MD  
Charlene Hart  
Gyna Williamson

"Our Care Redesign process focused on the patient journey and how we can improve the quality and experience of the care we provide."

Theresa McDonnell, DNP, ACNP-BC  
Nurse Lead, Cancer Care Redesign Teams

Representing the Lung Cancer Care Redesign Team, Administrative Lead Mara Bloom, Executive Director of the Mass General Cancer Center, and Nursing Lead Theresa McDonnell, DNP, ACNP-BC, Nursing Director, accepted Certificates of Appreciation during the Wave 2 Appreciation Ceremony.
**Lung Cancer Care Redesign: Implementation of Standard Protocols**

**AIM:** Reduce overall costs of non-small cell lung cancer care, stages I – III, by adhering to standard protocols based on guidelines from the National Comprehensive Cancer Network (NCCN) and American College of Chest Physicians (ACCP)

**INTERVENTIONS**
Developed practice standards based on NCCN and ACCP guidelines in six areas:

- **Lymph Node Sampling:** Ensure collection of at least three mediastinal (N2) lymph node stations during the time of lobectomy
- **Mediastinal Staging:** Ensure mediastinoscopy utilization meets clinical appropriateness guidelines
- **Open vs. VAT Lobectomy:** Utilize minimally invasive VATs procedure for small tumors; track utilization of each procedure
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- **IMRT:** Ensure utilization meets clinical appropriateness guidelines without compromising ability to provide industrialized, high-precision therapy
- **Imaging Surveillance:** Ensure CT scans are performed according to a standardized timetable

Solicited input from patients on proposed changes, particularly reduced use of IMRT and imaging.

**TEAM LEADERS**
Mara Bloom, Executive Director
Michael Lanuti, MD
Terry McDonnell, NP
Jennifer Temel, MD

**SAMPLE RESULTS**

**Standardization of Four Approved Chemotherapy Regimens**

**Change in IMRT Utilization**

**Fraction of Surgical Patients Receiving Mediastinoscopy by Stage**

*Source: post-implementation chart review*

**CONCLUSIONS**

- Agree to implement practice standards in six areas
- Methods for tracking compliance to standard are in development
- Baseline costs determined, providing the foundation for setting cost reduction targets by modality

**NEXT STEPS**

- Hard wire standards into IT systems
- ROE enhancements
- Project underway that focuses on using NP patient calls to reduce readmissions
Neuroendovascular Care Redesign Team

The Neuroendovascular Care Redesign Team focused in two areas: Elective endovascular repair of an unruptured aneurysm and ruptured intracranial aneurysm with subarachnoid hemorrhage.

For elective endovascular repair of an unruptured aneurysm, the Team reviewed patient charts and found that, on average, patients lie flat for 20 hours after elective endovascular repair of an unruptured aneurysm, and spend at least two nights in the hospital. A patient survey indicated that lying flat may result in back pain, discomfort and disrupted sleep. The team set out to improve patient experience and decrease the hospital length of stay for these patients by discontinuing heparin early in the peri-procedural period, thereby accelerating sheath removal, patient ambulation and patient discharge.

Interventions included:

- Developing criteria for patients at low risk of developing neurological or thromboembolic complications to be enrolled in a pilot of heparin discontinuation in the early peri-procedural period
- Piloting a program to train ICU nurses in sheath removal to provide flexibility in the timing of this step
- Developing patient education materials to help set patient expectations about the timing of events and possible discharge after this elective procedure

The interventions demonstrated that a defined subset of patients can safely have their heparin discontinued early, which resulted in a reduction of 1 day in hospital LOS. In addition, the early heparin protocol was better for the patient experience: better sleep and less back pain were reported via survey, and less access site bleeding/oozing was observed.

For ruptured intracranial aneurysm with subarachnoid hemorrhage, the team aimed to reduce the ICU length of stay and/or overall hospital length of stay by increasing awareness of the patient’s care plan, status and estimated date of transfer and discharge to all members of the Neuro ICU multidisciplinary care team.

Interventions included:

- Rapidly communicating an estimated date of ICU transfer (EDT) and hospital discharge (EDD) across the entire care team by documenting these estimated dates in the ICU attending’s note
- Establishing an efficient multidisciplinary rounds (MDR) regimen in the Neuro ICU to facilitate planning for transfer and/or discharge
- Testing a structured document for family meetings

Results of a survey following the implementation of MDR found that 88% of staff members thought the MDR helped expedite the patient’s transition to the next level of care, and ICU attendings achieved very high rates of compliance in documenting the EDT and EDD.

TEAM MEMBERS

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Tracy Ellen Duggan, RN
Vanessa Gormley, RN

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“Most importantly, in our Care Redesign initiative, our team felt like we were improving the quality of care provided to our patients, and patients felt like the quality of their care was improved.”

Mary Guanci, RN
Nurse Lead, Neuroendovascular Team
Intracranial Neuroendovascular Care Redesign: Elective Endovascular Repair of Unruptured Aneurysm

PROBLEM STATEMENT: A review of 18 charts showed that on average, patients lie flat for 20 hours after elective endovascular repair of an unruptured aneurysm, and spend at least two nights in the hospital. A patient survey indicated that lying flat may result in back pain, discomfort and disrupted sleep.

AIM: Decrease the median hospital length for patients having elective endovascular repair of an unruptured intracranial aneurysm from 52 hours to 48 hours or less by December 2012.

INTERVENTIONS
• Develop criteria for patients at low risk of developing neurological or thromboembolic complications to be enrolled in a pilot of heparin discontinuation in the early peri-procedural period
• Pilot a program to train ICU nurses in sheath removal to provide flexibility in the timing of this step
• Develop patient education materials to help set patient expectations about the timing of events and possible discharge after this elective procedure

RESULTS

TEAM LEADERS
Teresa Vanderboom, NP

PROJECT SPONSOR
Joshua A. Hirsh, MD

CARE REDESIGN STEERING TEAM
Lauren Ellis
Mary Guanci, RN
Michael R. Jaff, DO
Whitney C. Roberts, MPH
Javier Romero, MD
Joan Strauss

CONCLUSIONS
• A defined subset of patients can safely have their heparin discontinued early, which resulted in a reduction of 1 day in hospital LOS
• The early heparin protocol was better for the patient experience: better sleep and less back pain was reported via survey, and less access site bleeding/oozing was observed
• Six ICU nurses were fully qualified to remove sheaths, but the small numbers of patients made logistics challenging

NEXT STEPS
Steering Team has been formed within Neuro-Interventional to continue the work:
• Continue to enroll eligible patients in the early heparin protocol
• Evaluate expanding the patient inclusion criteria
• Evaluate options for sheath removal
Intracranial Neuroendovascular Care Redesign: Structured Communication in the Neuro ICU

**AIM:** Reduce the ICU length of stay and/or overall hospital length of stay for patients with a ruptured intracranial aneurysm with subarachnoid hemorrhage (SAH) by increasing awareness of the patients care plan, status and estimated date of transfer and discharge to all members of the Neuro ICU multidisciplinary care team

**INTERVENTIONS**

- Rapidly communicate an estimated date of ICU transfer (EDT) and hospital discharge (EDD) across the entire care team by documenting these estimated dates in the ICU attendings note
- Establish an efficient multidisciplinary rounds (MDR) regimen in the Neuro ICU to facilitate planning for transfer and/or discharge
- Test a structured document for family meetings

**RESULTS: EDD/EDT**

![Audit Data: EDD/EDT in Neuro ICU Attending Note](image)

**RESULTS: MDR**

**Survey Results**

88% of staff members thought the MDR helped expedite the patient’s transition to the next level of care.

**Quotes from Staff**

“The rounds made it possible to clarify what aspects of patient assessment needed to be completed prior to next level of care being determined.” –RN

“The MDR highlighted barriers to disposition and recommendations toward discharge.” –CM

“Rounds have been quick, efficient in discussing the relevant issues and helps us, as a service, direct our care to the right patient at the right time.” –PT

**CONCLUSIONS**

- ICU attendings achieved very high rates of compliance in documenting the EDT and EDD
- A brief, discharge-focused MDR can be established in the Neuro ICU setting
- The EDT, EDD and MDR are useful tools for planning and prioritizing activities
- A structured document for family meetings was piloted and did not add substantial value

**NEXT STEPS**

- Sustain documentation of EDT/EDD in the ICU attending note
- Expand the effort to improve communication between the Neuro ICU and the Neuroscience floors

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The OB Care Redesign Team built a multidisciplinary coalition to achieve its aim of providing cost-efficient, high-quality, antepartum, intrapartum and postpartum care to lead to optimal maternal and neonatal outcomes.

The OB Care Redesign Team tested several improvement initiatives in the areas of:
- Improving efficiency in antepartum scheduling (time to 1st appointment)
- Centering visits
- New patient education materials for induction process
- Method of induction
- New algorithm for evaluation of labor and premature rupture of membranes
- New POE order set created for Preeclampsia evaluation
- Innovation Unit interventions for postpartum care

Through their improvement initiatives, the OB Care Redesign measured a decrease in social inductions, decreased time on Labor & Delivery, decreased overall lengths of stay, and fewer labs and evaluations.

“The thing that I am most proud of in our Care Redesign project is that we were able to engage sixty providers, who touch our patients over the course of their pregnancy, in the redesign process. Everyone was enthusiastic about the opportunity to improve care for our patients.”

Laura Riley, MD
Physician Lead, Vaginal Delivery/OB Team

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AIM: For women planning a vaginal delivery at Mass General, we will provide cost-efficient, high-quality, antepartum, intrapartum and postpartum care, which will lead to optimal maternal and neonatal outcomes

INTERVENTIONS
• Antepartum: Time to 1st appointment
• Antepartum: Centering visits
• Indications for induction
• Method of induction
• Evaluation of labor & PROM (premature rupture of membranes): Design new algorithm
• Evaluation of preeclampsia
• Postpartum: Innovation Unit

CONCLUSIONS
• Collaboration amongst all who touch an OB patient has been extraordinary
• Decrease in social inductions
• New POE order set created for preeclampsia evaluation
• New patient education materials for induction process

COST SAVINGS OPPORTUNITIES
• Improving efficiency antepartum allows more patients to be seen
• Decreased time on L&D
• Decreased overall length of stay
• Fewer labs and evaluations

NEXT STEPS
• Dashboard information should drive future projects/opportunities
Transplant Care Redesign Team

The Transplant Care Redesign Team aimed to:
• Increase clinical efficiency and patient satisfaction across the Transplant Center
• Establish a culture of process improvement
• Identify opportunities for cost reductions
• Develop a dashboard to track progress

The team mapped processes and identified major drivers of cost, then identified targets, implemented interventions and measured progress toward their goals. The team implemented projects for pre-transplant, transplant admissions, and discharge/readmission; revised policies, procedures and evaluations; created a new protocol for immunosuppression medications; collaborated with care management to improve discharge and readmissions; and tested a pilot to shorten length of stay for kidney transplant patients.

Preliminary data for the Care Redesign interventions showed: antifungal utilization decreased 6% in year 1 and 10% in year 3 (2012); length of stay for renal transplant patients decreased by 1 day for deceased donor transplants and ½ day for living donors; utilization of fresh frozen plasma was reduced 50% in year 2; patient satisfaction show that 100% will recommend Mass General Transplant.

TEAM MEMBERS

Jay Fishman, MD
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Amy Jarry, NP
Amy Norrman
Andrew Liteplo, MD
Angela Marquez, MBA
Anne LaFleur
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Robert Birnbaum, MD
Sandy Silvestri, RN, MS
Sarah (Huachuan) Shao
Stephanie Ennis, NP

“The Care Redesign process forced us to develop a culture of change in the Mass General Transplant Center, which has helped us engineer the future of transplant care to provide the best care, at the best value, for our patients.”

Jay Fishman, MD
Physician Lead, Transplant Team

Representing the Transplant Care Redesign Team, Anthony DiGiovine, RN, discussed the Transplant Team’s Care Redesign Fair poster with special guest, Kelly Hancock, Executive Chief Nursing Officer, of the Cleveland Clinic.
Mass General Transplant Center: Care Redesign

GOALS/ACHIEVEMENTS:

- Increase clinical efficiency and patient satisfaction across the Transplant Center
- Establish a culture of process improvement
- Identify opportunities for cost reductions
- Develop dashboards to track progress

APPROACH

- Map processes and identify major drivers of cost
- Identify achievable targets
- Implement quickly
- Measure progress

PRELIMINARY DATA EXAMPLES (OF 36 PROJECTS):

- **Antifungal utilization:** 6% reduction in year 1, 10% in year 3 (2012)
- **Renal Length of Stay:** One day reduction for deceased donor transplants, 0.5 day reduction for living donors
- **Fresh frozen plasma:** 50% reduction in year two
- **Patients who will recommend Mass General Transplant:** 100%

TEAM LEADERS
Jay Fishman, MD
Joren Madsen, MD
Debra Doroni, MBA
Tony DiGiovine, RN
Gianna Wilkins, Process Improvement
Launched at Mass General/MGPO: April 2012

- Acute Myocardial Infarction (AMI)
- Chronic Obstructive Pulmonary Disease (COPD)
- Back Pain
- Inpatient Psychiatry
- Premature Neonate
- Rheumatology
Furthering the work of the first Coronary Artery Disease-AMI Care Redesign effort, the team reformed in 2013 and is focusing on the larger population of patients with AMI and acute coronary syndrome (not just those with STEMI) who have a percutaneous coronary intervention (PCI). The team aims to streamline the flow from the time the patient leaves the catheterization lab until 30 days after discharge. The goals are to optimize care, reduce unnecessary variation and provide evidence-based treatment customized to individual patient needs.

The following methods will be used:

- Standardize handover between catheterization lab and inpatient units
- Initiate and monitor routine/essential elements of clinical care for all AMI patients from the moment of arrival to the unit
- Provide patient-friendly educational material that encourages active patient engagement
- Make use of checklists to drive critical elements of care and ensure their completion
- Assess the home environment and ability of the patient to engage in health maintenance and compliance
- Facilitate a safe transition to home, community and work
- Ensure continuity of care through the PCP, the patient-centered medical home (PCMH), and appropriate support services

“The AMI team members are so passionate about providing the best and safest care for our patients, and the process mapping meeting provided an opportunity for everyone to have a voice in how care for AMI patients should be redesigned.”

Kenneth Rosenfield, MD
Physician Co-Lead, AMI Care Redesign Team

TEAM MEMBERS

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Pratik Rachh
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Carolyn H Cain
Erica E. Edwards, RN
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William J. Hucker, MD, PhD
Sharon McKenna
Katherine Ann Sakmar MD
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Kathleen C Traynor
Jason H. Wasfy, MD, MPhil
Catherine Benacchio, RN
Cristina M. Bethune
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Janice A. Fileteau
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Eugene Pomerantsev, MD, PhD
Andrew N. Rassi, MD
Jennifer M. Searl
Judith H. Silva, RN
Erin J. Stack
Elizabeth S. Temin, MD
Kelly E. Trecartin, NP
Laura Tresvik
Lisa Trifari, NP
Brian French, RN-BC, PhD(c)
**AIM:** Optimize care for AMI patients with or without PCI, by reducing unnecessary variation and providing evidence-based care customized to individual patient needs

**INTERVENTIONS**

Three multidisciplinary task forces formed to address hand-offs, clinical care and transitions-readmissions:

- **Hand-off Task Force:** Standardize communication between the Cath Lab and CCU/E10/E11 to relay the right information to the right person at the right time and in the right format so as to positively affect patient safety and experience across the care units
- **Clinical Care Task Force:** Create standards around clinical management horizontally and vertically among the units so that patients receive optimal care irrespective of their location and provider. Set minimum expectations of care that each patient should receive, and encompass mandatory and discretionary components right from the time a patient is wheeled into the unit until disposition
- **Transitions-Readmissions Reduction Task Force:** Steer the critical care components in preparation of patients' transition to home and work environment. With an eye on reducing readmissions and improving patient satisfaction, identify the vital care components and champion their timely execution across the patients' journey at our hospital, and post discharge

**RESULTS**

**Acute Myocardial Infarct Redesign**

**TEAM LEADERS**
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Chelby L. Cierpial, RN  
Janet M. McClintic, MHA  
Pratik Rachh, Process Improvement

**PROJECT SPONSOR**  
William G. Dec, MD

**NEXT STEPS**
- Pilot prioritized ideas
- Adopt, adapt or abandon ideas
- Measure and track progress
The COPD Care Redesign Team is focused on establishing a well-coordinated continuum of patient-centered services including education, medication compliance and exercise, with the goals of reducing hospital admissions and readmissions while optimizing the patient’s quality of life and health status.

The COPD Team is planning outreach to primary care physicians to optimize outpatient medications to avoid hospitalizations; complete initial trials of action plans and embed the action plans in LMR; implement a pop-up message regarding inpatient drugs of choice, pilot an innovative mobile device for patient education and self-monitoring, and track key outcomes, including quality of life, inpatient length of stay, readmission rate and overall iCMP patient costs.

The team has worked hard to design the following interventions:

- Partner with the Mass General Integrated Care Management Program (iCMP) to provide better management of high risk COPD patients, focused on outreach to primary care physicians to insure drug regimens are optimal, provide primary care physicians and patients with action plans that facilitate early outpatient treatment of COPD exacerbations, and partner with the Center for Connected Health to evaluate the utilization of a mobile device for patient education and self-monitoring
- The Pulmonary and Critical Care Medicine/Chelsea Health Center Community Outreach COPD program
- Evaluate a pulmonary rehabilitation intervention comprised of minimal on-site visits, patient-directed in-home training, ongoing support and monitoring via phone and/or mobile device
- Convert high-cost inhalers to lower-cost medications to reduce inpatient drug costs

“Care Redesign has stretched how I think about taking care of our patients with COPD. It allowed us to explore new ground and design new processes to provide better, more efficient patient care.”

Michael Sullivan, PT, DPT, MBA
Clinical Lead, COPD Team

TEAM MEMBERS

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Michael Sullivan, PT, DPT, MBA
Christine Kaliris
Joan Strauss
Alison Squadrito
Ann Erwin

Joanne Doyle Petrongolo
Joanne Kaufman, RN
Mary Bourgeois
Mary Neagle
Philip Carrieri
Robert Sutherlin, RN
Ryan Thompson, MD
COPD Care Redesign

**AIM:** Establish a well-coordinated continuum of patient-centered services including education, medication compliance and exercise, with the goals of reducing hospital admissions and readmissions while optimizing the patient’s quality of life and health status

**INTERVENTIONS**

1. Partner with the Mass General Integrated Care Management Program (iCMP) to provide better management of high-risk COPD patients:
   - Outreach to PCPs to ensure drug regimens are optimal
   - Provide both PCPs and patients with action plans that facilitate early outpatient treatment of COPD exacerbations.
   - Partner with the Center for Connected Health to evaluate use of a mobile device for patient education and self-monitoring
2. Pulmonary and Critical Care Medicine/Chelsea Health Center Community Outreach COPD program
3. Evaluate a pulmonary rehabilitation intervention comprised of minimal on-site visits, patient-directed in-home training, ongoing support and monitoring via phone and/or mobile device (described below)
4. Inpatient Medication Utilization — Conversion of high-cost inhalers to lower-cost medications to reduce inpatient drug costs

**BASELINE DATA – CY12**

**Mass General COPD Patients = 4,298**
- All cause inpatient admission: n = 1902
- 30-day readmission rate = 20.6%
- COPD related inpatient admission: n = 567
- 30-day readmission rate = 21.5%
- Obs/Exp LOS ratio = 1.18 (479 excess days)

**COPD patients currently in the iCMP Program = 417***
- All cause inpatient admissions = 259
- 30-day readmission rate = 18%

*An additional 245 patients are eligible or new to the iCMP program

Some facts about the COPD/iCMP cohort:
- Patients who go home after admission for a COPD exacerbation: 75%
- Patients participating in any pulmonary rehabilitation: n = 23 of 417 (6%); degree of participation in the program varied widely

**MOBILE DEVICE**
For patient education and self-monitoring. Capabilities include:
- Patient self-reporting of medication compliance and symptoms
- Wireless interface with pedometer, pulse oximeter and scale
- Custom educational videos
- Remote monitoring and video chat

**TEAM LEADERS**
Paul Currier, MD
Fiona Gibbons, MD
Christine Kaliris, Admin Director
Joan Strauss, Process Improvement
Michael Sullivan, PT, DPT, MBA

**NEXT STEPS**
- Outreach to PCPs for optimization of outpatient medications to avoid hospitalizations
- Complete initial trials of action plan and embed in LMR
- Implement a pop-up message regarding inpatient drugs of choice
- Initiate mobile device pilot in the fall of 2013
- Track key outcome measures
  - Quality of life
  - Inpatient LOS
  - Readmission rate
  - Overall costs (for iCMP patients)
- Other measures of interest:
  - Improved function/independence
  - Medication compliance
  - Oxygen use
  - Smoking cessation
The current treatment navigation system for patients who present with low back pain is very complex. Patients may end up on one of the many services that treat back pain and there may be a delay in getting them to the appropriate service. Challenges with the current treatment navigation system include difficulty in navigating the care system with patient demands driving much of care decision-making and treatment variation between providers.

The Back Pain Care Redesign Team is a multidisciplinary group with representation from Orthopaedic Spine, Neurosurgery Spine, the Pain Center, Physiatry, Physical Therapy, Radiology, Occupational Health, Internal Medicine, the Emergency Department, Case Management, Social Services, Admitting Services and the Professional Billing Office. The goal of the Back Pain Care Redesign team was to define clear pathways to improve variation and appropriateness of care through the following interventions:
1.) Mass General Spinal Pain Algorithm; 2.) Mass General Spine Line; 3.) ED Observation Unit Project.

To address issues related to navigating the treatment system for back pain, the Back Pain Care Redesign Team developed an algorithm to standardize care and provide support to clinicians to help them direct patients to the appropriate service.

The team also designed the Mass General Spine Line, which will provide a single telephone number where patients or providers can speak to a nurse practitioner well versed in the national guidelines and their specific adaptation for Mass General practices. This specialist will help the provider (and possibly in the future, the patient) determine the appropriate next steps for resolving the back pain episode and make a referral if indicated. Effective Spine Line management will: improve access to care and appropriateness of referrals; increase referring provider satisfaction and overall referrals; increase patient satisfaction; reduce admissions and length of stay; and decrease total costs of care.

The Back Pain Team is also working to ensure appropriate utilization of the ED Observation Unit for patients with back pain in an effort to reduce unnecessary admissions to inpatient units, the number of bed days and the cost of treating patients with acute low back pain.

“Back pain affects patients across the continuum of care, from primary care to subspecialists, and the Care Redesign process gave us an opportunity to pull together a broad, multidisciplinary team to design a more efficient and effective system for managing our patients.”

Chris Gilligan, MD
Physician Co-Lead, Back Pain Team

TEAM MEMBERS

Chris Gilligan, MD  Jim Rathmell, MD  Joe Schwab, MD, MS  Jordan Romano, DO  Keith Marple  Kelsey McCarty  Vanessa Rao  Andy Gottlieb, NP  Ben Orcutt  Bill Palmer, MD  Bonnie Chabra  David Binder, MD  David Peak, MD

Diane Plante, PT  Janice Filteau  Jean-Valery Coumans, MD  Joshua Hirsch, MD  Karen Sepucha  Katy Perkins  Leigh Simmons, MD  Marie Gioiella, MSW, LICSW  Mike Sullivan, DPT, PT, OT  Ryan Thompson, MD  Sanjay Chaudhary  Steve Atlas, MD  John Shin, MD
**AIM:** The current treatment navigation system for patients who present with low back pain is very complex. Patients may end up on one of the many services that treat back pain, and there may be delays in getting patients to the appropriate service. Challenges with the current treatment navigation system include:

- Difficulty in navigating the care system with patient demands driving much of care decision-making
- Treatment variation between providers

The Back Pain Care Redesign Team is a multidisciplinary group with representation from Orthopaedic Spine, Neurosurgery Spine, the Pain Center, Physiatry, Physical Therapy, Radiology, Occupational Health, Internal Medicine, the Emergency Department, Case Management, Social Services, Admitting Services and the Professional Billing Office. The goal of the Back Pain Care Redesign Team is to define clear path ways to improve variation and appropriateness of care through the following interventions:

1. Mass General Spinal Pain Algorithm
2. Mass General Spine Line
3. ED Obs Unit Project

**CURRENT STATE**

**FUTURE STATE**

**PROJECT CHAIRS**
Jim Rathmell, MD
Chris Gilligan, MD

**TEAM LEADERS**
Joe Schwab, MD, MS
Jordan Romano, DO
Kelsey McCarty
Keith Marple
Vanessa Rao

**TEAM MEMBERS**
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Bill Palmer, MD
David Peak, MD
Katy Perkins
Diane Plante, PT
Vanessa Rao
Karen Sepucha
Leigh Simmons, MD
Mike Sullivan, DPT, PT, OT
Ryan Thompson, MD
AIM: Navigating the treatment system is challenging for patients who present with back pain. Patients may end up on one of the many services that treat back pain and there may be a delay in getting them to the appropriate service; there is a need to clearly define the pathway. One intervention to address this issue is the development of an algorithm to standardize care and provide support to clinicians to help them direct patients to the appropriate service.

TEST
- Determine the appropriate triage point based on patient’s spinal condition/symptoms
- Modify full algorithm for PCP/ED-specific needs for easy reference and clinician usability
- Roll out pilot to specific practices (ED, PCP offices, Urgent Care)

NEXT STEPS
- Modify current guidelines for PCP and ED versions
- Pilot PCP/ED guidelines and review results
- Develop web application to increase ease of use
- Incorporate guidelines into clinical decision support systems

Back Pain Care Redesign: Mass General Spinal Pain Algorithm

**Teams Members**
- Jim Rathmell, MD
- Chris Gilligan, MD
- Joe Schwab, MD, MS
- Steve Atlas, MD
- Diane Plante, PT
- Leigh Simmons, MD
- Ryan Thompson, MD
- Kelsey McCarty
- David Peak, MD
- Keith Marple
- Jean-Valery Coumans, MD
- Vanessa Rao

**Project Chairs**
- Jim Rathmell, MD
- Chris Gilligan, MD

**Team Leaders**
- Jordan Romano, DO
- Kelsey McCarty
- Keith Marple
- Steve Atlas, MD
- Chris Gilligan, MD
- David Peak, MD
- Vanessa Rao

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AIM: Common spinal disorders are well-studied conditions with nationally accepted treatment guidelines, but also a wide array of treatment options. These include conservative care, pain medications, injections, imaging, physical therapy and surgery. The majority of patients with spinal conditions first see their primary care provider or visit the Emergency Department. For patients and providers, however, the guidelines, appropriate plan of care and referral options often remain unclear.

The Spine Line will provide a single telephone number where patients or providers can speak to a nurse practitioner well versed in the national guidelines and their specific adaptation for Mass General practices. This specialist will help the provider or patient determine the appropriate next steps for resolving the back pain episode and make a referral if indicated.

TEST

The objective of the Spine Line is to ensure that patients with episodes of spinal disorders receive a timely care management plan designed to resolve their pain, while sparing them unnecessary procedures and visits so they can return to normal function as soon as possible. We anticipate that the Spine Line will be a resource primarily for PCPs and the ED. Effective Spine Line management will:

- Improve access to care and appropriateness of referrals
- Increase referring provider satisfaction and overall referrals
- Increase patient satisfaction
- Reduce admissions and length of stay
- Decrease total costs of care

RESULTS

The Spine Line will begin shortly. Many logistical decisions have been made for implementation:

- The Spine Line will be staffed with an NP familiar in the treatment courses for spinal disorders
- The specialist will answer calls from referring providers (estimated call volume = 2,500 PCP and ED referrals annually)
- The Mass General Acute Low Back Pain Guideline will be used to determine the appropriate next steps in the patient’s care plan
- If a referral is indicated, the Back Pain “Who to Contact” list will assist in booking the first appointment availability and book the referral for the patient
- The Spine Line will be operational Monday through Friday, 8 am – 4:30 pm

NEXT STEPS

- Identify NP to fill role
- Design referral system to be used
- Pilot Spine Line in PCP offices and ED
Back Pain Care Redesign: Mass General Emergency Department (ED) Observation Unit Project Group

**AIM:** Patients with non-surgical back pain who come to the ED are either discharged home after treatment or are admitted to the ED Observation Unit or an inpatient unit. Patients on the inpatient unit tend to have a longer-than-expected length of stay. The goal is to reduce unnecessary admissions to inpatient units, the number of bed days and the cost of treating patients with acute low back pain.

**TEST**
Initiatives planned or under way to meet the goals include:
- Continue referring appropriate patients from ED to ED Observation Unit rather than inpatient units
- Create standardized clinical guidelines to manage patients in ED Observation Unit
- Immediate availability of pain consultants for pain management
- Rapid access to spinal injections
- Provide access to urgent outpatient physical therapy

**RESULTS**
- The length of stay for patients admitted directly to an inpatient unit was 5.2 days, versus 2.6 days for patients who were admitted from ED Obs to an inpatient unit
- The number of patients admitted to an inpatient unit has decreased and Mass General projects to save ~100 bed days in inpatient units

**NEXT STEPS**
- Track and review pilot results
- Learn from the results
- Adapt, Adopt or Abandon changes
- Identify other areas to improve to ensure safe discharge of patients

---

**PROJECT CHAIRS**
Jim Rathmell, MD
Chris Gilligan, MD

**TEAM LEADERS**
Jordan Romano, DO
David Peak, MD
Bonnie Chabra
Keith Marple

**TEAM MEMBERS**
Jim Rathmell, MD
Chris Gilligan, MD
Joe Schwab, MD, MS
Jordan Romano, DO
Kelsey McCarty
Keith Marple
Steve Atlas, MD
David Binder, MD
Bonnie Chabra
Sanjay Chaudhary
Jean-Valery Coumans, MD
Janice Filteau
Marie Gioiella, MSW, LICSW
Andy Gottlieb, NP
Joshua Hirsch, MD
Ben Orcutt
Bill Palmer, MD
David Peak, MD
Katy Perkins
Diane Plante, PT
Vanessa Rao
Karen Sepucha
Leigh Simmons, MD
Mike Sullivan, DPT, PT, OT
Ryan Thompson, MD
National Recognition for Back Pain Care Redesign Team

PRESENTATIONS / POSTERS / PUBLICATIONS

Christopher Gilligan, MD
Preparing for Accountable Care: Understanding the Costs in Caring for Patients with Back Pain and Assembling a Comprehensive Care Team and Strategies for Minimizing Inpatient Length of Stay.

Session Title: Back Pain and Health Care Redesign: Preparing for Accountable Care.
• James Rathmell, MD
  Preparing for Accountable Care: Understanding the Cost in Caring for Patients with Back Pain and Assembling a Comprehensive Care Team.
• Joseph Schwab, MD
  Acute Back Pain: Establishing Rational Care From Onset to Resolution
• Christopher Gilligan, MD
  Caring for the Patient with Back Pain who Requires Hospitalization: Strategies for Minimizing Inpatient Length of Stay

American Society of Interventional Pain Physicians, November 16 - 17, 2013
Christopher Gilligan, MD
Caring for the Patient with Back Pain who Requires Hospitalization: Strategies for Minimizing Inpatient Length of Stay.

American Society of Regional Anesthesia and Pain Management, November 21 - 24, 2013
Christopher Gilligan, MD
Reducing Length of Stay and Inpatient Admissions of Patients Presenting with Acute Low Back Pain Through Use of Observation Units

American Society of Anesthesiologists (ASA), January 2014 Newsletter (January 2014, Volume 48, Number 1)
Christopher Gilligan, MD
Care Redesign

“Care redesign is where health care is headed. When we talk about what we are doing outside of the institution, there is incredible enthusiasm and our team is being asked to present our efforts to redesign care for patients and how we are preparing for the future.”

James Rathmell, MD
Physician Co-Lead, Back Pain Team
Inpatient Psychiatry Care Redesign Team

Access to limited psychiatry beds is crucial for patients awaiting placement in the ED, medical-surgical units and outpatient practices. Initiatives were undertaken on Blake 11 to reduce length of stay and to facilitate early discharge to enhance access to our medical psychiatry unit. The goals of the Inpatient Psychiatry Care Redesign Team were well aligned with and helped further advance the improvements achieved through the Innovation Unit initiative.

The Inpatient Psychiatry Care Redesign Team piloted the following initiatives: identification of a target discharge date at time of admission; moving “super team” earlier in the morning (to 8:45 am instead of 11:00 am), and supporting culture change. The attending RN role, created as part of the Innovation Unit to facilitate prescriptions, arrange transportation and coordinate warm handoffs, was crucial to the success of these initiatives. As it was determined that patients receiving ECT (electroconvulsive therapy) accounting for a large proportion of outliers with particularly long hospitalizations (average LOS > 15 days), variability in the time to consult for ECT and initiate treatment were also identified as targets for process improvement.

The pilot tests of change showed: mean LOS decreased by a full day from approximately 11.3 days to 10.2 days while pre-noon discharge increased by several-fold from 6-14% to 20-39% without an increase in readmission rates. Time to request a consult for ECT dropped from 3.5 days to 1.2 days; time to first ECT was reduced from 6.5 days to 3.0 days; Average LOS for ECT patients was reduced from 16.4 days to 14.5 days.

TEAM MEMBERS

Jonathan Alpert, MD, PhD
Tony Weiss, MD, MBA
Christina Stone, RN
Jeff Huffman, MD
Joy Rosen
Sanjay Chaudhary
Joan Strauss

Jonathan Alpert, MD, physician lead of the Inpatient Psychiatry Team, and Sanjay Chaudhary, senior process improvement consultant for the Inpatient Psychiatry Team, at the Care Redesign Fair
Psychiatry Care Redesign: Sustaining Gains

**AIM:** Blake 11 is a critical medical-psychiatry inpatient unit for the region. Access is crucial for patients awaiting beds in the ED, medical-surgical units and outpatient practices. Initiatives were undertaken on Blake 11 to reduce length of stay and to discharge patients as early in the day as safely possible, while assuring that the readmission rate was not affected adversely. Our care redesign efforts were piggybacked onto a bundle of changes associated with the March 2012 Innovation Unit roll out.

**TEST**
- Culture change
- Identifying a target discharge date at time of admission
- Moving “super team” to 8:45 am (instead of 11:00 am)
- Creation of the attending RN role as part of the Innovation
- Unit to facilitate prescriptions, arrange transportation, coordinate warm handoffs

**CONCLUSIONS**
- Communicating with staff about goals, vision and clear expectations, and providing regular feedback are crucial
- Engaging the staff is critical to operationalize the changes and to sustain the gains

**NEXT STEPS**
- Keep monitoring the results
- Systematize the process changes

**RESULTS**

- **Observed to Expected Avg Length of Stay**
- **Pre-noon Discharge Rate**
- **Readmission Rate:** has remained steady since the institution of the changes

**TEAM MEMBERS**
Tony Weiss, MD, MBA
Jonathan Alpert, MD, PhD
Jeff Huffman, MD
Christina Stone, RN
Joy Rosen
Sanjay Chaudhary
Joan Strauss
Psychiatry Care Redesign: Improving ECT Processes

**AIM:** As part of efforts to reduce inpatient psychiatry [Blake 11] length of stay, it was determined that patients receiving electroconvulsive therapy (ECT) were among outliers with an average LOS > 15 days over patients not receiving ECT. Variability in the time to consult for ECT and initiate treatment were identified as targets for process improvement.

**TEST**
- Identify patients who need ECT
- Ensure consults are called at the earliest (prior to admission when possible)
- Ensure consults happen within 24 hours
- Ensure patients are scheduled and all work-up happens promptly if consult service recommends ECT

**RESULTS**

![ECT Timing Chart]

**CONCLUSIONS**
- Pilots have shown that time to request consult for ECT has decreased from 3.5 days to 1.2 days
- Time for First ECT has decreased from 6.5 days to 3.0 days
- ALOS for ECT patients has decreased from 16.4 days to 14.5 days
- Readmission rate is unchanged, showing no adverse impact

**NEXT STEPS**
- Monitoring the results to sustain the gains
- Systematize the process changes
“The Innovation Units and Care Redesign Teams have been working together over the past two years to advance patient- and family- focused care, improve processes and ensure care is safer, more timely and more equitable. We have a great past and a bright future with these teams working together.”

Jeanette Ives Erickson, RN, DNP, FAAN
Chief Nurse and Senior Vice President for Patient Care Services
The Premature Neonate Care Redesign Team is a multidisciplinary group, representing physicians, nurses, case managers, social workers, physical therapists, occupational therapists and dietitians. The team has focused its efforts in the following areas:

• **Utilization of routine head ultrasounds for premature neonates:** After reviewing Mass General newborn outcomes since 2006, the team implemented updated routine head ultrasound screening guidelines, based on American Academy of Neurology recommendations, improving value by reducing the number of unnecessary studies and improving clinical care by not subjecting premature babies to unnecessary stress. After implementing the revised guidelines for babies born less than 30 weeks gestation, the Premature Neonate Care Redesign Team measured a 60% reduction in head ultrasound utilization, which would lead to an approximate cost savings of $200,000. While this initiative reduced costs, it also achieved the goal of improved patient care by eliminating unnecessary procedures for our tiniest patients.

• **Weekly multidisciplinary rounds and family meetings:** The team found opportunities to improve the rounding process, redefined roles and responsibilities for follow-up care, and utilized the Innovation Unit’s attending nurse to facilitate the weekly meeting. In addition to continuing routine bedside updates, formal multidisciplinary family meetings now happen more than 80 percent of the time within 10 days of the admission.

• **Optimizing nutrition and growth:** The team collected data on infant growth and determined that establishing processes to optimize nutrition and growth were needed. First, the team brought awareness to data and the issue. Next, the team implemented a comprehensive approach to improving nutrition delivery, including standardizing initiation and advancement of both enteral and IV nutrition, making pasteurized donor human milk available, and developing an electronic growth chart for closer monitoring. After nine months the team significantly improved the growth outcomes in all gestational age categories, with the greatest improvements in the most premature neonates.

• **Medical insurance and newborn names:** The team is currently working to address issues surrounding administrative hurdles Neonatal Intensive Care Unit (NICU) infants face because they are born and admitted to the NICU without a name. It causes barriers to obtaining medical insurance and facilitating transfers. The Team is working with representatives from different departments across the hospital to develop a solution.
**AIM:** Implement updated routine head ultrasound screening guidelines to improve the value of care that is provided by reducing the number of unnecessary studies and also improve clinical care by not subjecting premature babies to the stress of studies that are not helpful.

**TEST**

After reviewing local outcomes, changed routine head ultrasound screening guidelines to improve value of care by following the AAN recommendations:

- Routine screening head ultrasounds will only be done in babies of less than 30/7 weeks gestation
- Screening will occur at 7 – 14 days of age, with follow-up at 36 – 40 weeks corrected gestational age (if no concerns on first ultrasound)
- If intraventricular hemorrhage is found, guidelines for follow-up are specified
- A non-routine head ultrasound will still be done for any clinical indication where a head ultrasound would help guide management

**RESULTS**

**CONCLUSIONS**

- 60% reduction in head ultrasound utilization post-intervention

**NEXT STEPS**

- New guidelines adopted as standard clinical practice
The Rheumatology Care Redesign Team focused on specialty drug prescription and utilization patterns in the Rheumatology Clinic. Between FY 2007 and FY 2013, the number of infusions taking place in the Rheumatology Clinic has increased approximately 350%, and the number continues to grow.

This rapid increase caused a strain on staff resources and also affected patient care. To address this problem, the Rheumatology Care Redesign team worked to create new streamlined workflows relating to scheduling, obtaining prior authorizations, and accessing the clinic, so as to reduce delays for clinically effective treatments and maximize utilization of existing infusion chairs.

This new streamlined system resulted in:
- Decreased time between infusion appointment scheduling and infusion appointment
- Decreased percent of no-shows for infusion appointments
- Increased percent of arrival for infusion appointments

“We had great enthusiasm from the members of the Rheumatology Care Redesign Team. From the faculty, fellows, nurses and staff, everyone was motivated to address the challenges the clinic faces and work together to develop a system to improve the patient care and staff experience.”

John Stone, MD
Physician Lead, Rheumatology Care Redesign Team

TEAM LEADERS

John Stone, MD, MPH
Andrew Luster, MD, PhD
Brit Nicholson, MD
Deborah Collier, MD
Jaime Tirrell
Joseph Ianelli
Liza Nyeko, MS
Margaret Martin
Mark Schnell
Mary Cramer
Ray Mitrano, MS, RPh
Sean Gilligan
Traci Powers, RN
Aims

- Streamline processes/enhance efficiency (prescribing, authorizations, scheduling, utilization)
- Determine whether tradeoffs in treatment regimens can reduce total specialty drug costs while upholding clinical quality

Interventions

- Transition to electronic prescription and prior authorization forms
- Redesign prior authorization tracking and scheduling processes
- Implement SmartCalling
- Redirect incoming phone calls and redesign PSC/MD model
- Expand infusion chair access — collaboration with other infusion unit(s)/resource allocation
- Design patient education packets
- Revisit departmental policies (e.g. no show/cancellation)
- Explore relative specialty drug costs
- Explore clinically equivalent alternative treatment regimens
- Collaborate with other Mass General and Partners teams exploring similar questions

Results (To Date)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Desired Directional</th>
<th>Baseline CY12</th>
<th>Result to Date CY13 as of 6-30-13</th>
<th>Actual Directional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infusion sched. to appointment time</td>
<td>30-45 days</td>
<td>47.7 days</td>
<td>39.0 days</td>
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<tr>
<td>Infusion appt. no show %</td>
<td>decreasing</td>
<td>5.1%</td>
<td>3.8%</td>
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<tr>
<td>Infusion appt. arrival %</td>
<td>increasing</td>
<td>61.2%</td>
<td>65.9%</td>
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</tr>
<tr>
<td>OPA complaints</td>
<td>decreasing</td>
<td>16</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions (To Date)

- Access numbers are moving in the right directions
- Prior authorization/scheduling changes have enhanced capacity to track/manage denials for expensive drugs
- Patients, clinicians and staff report increased satisfaction with access and processes
- Transition to alternative potentially less costly clinically equivalent therapies is challenging due to variety of factors

Next Steps

- Develop education packets
- Continue to identify ways to maximize chair utilization
- Quantify changes in total denials
- Continue to explore relative drug costs and potential alternative treatment regimens
- Continue to explore potential collaborations at Mass General and Partners levels
Launched at Mass General/MGPO: June 2013

- Breast Cancer
- Heart Failure
- Kidney Stones
- Pain Management
- Readmission Reduction, focusing on AMI, Heart Failure, Pneumonia and COPD
# Preview of the Wave 4 Teams

In June, 2013, the fourth wave of Mass/MGPO Care Redesign Teams were launched. The Wave IV teams will focus on the following:

<table>
<thead>
<tr>
<th>Team Leaders</th>
<th>Patient Population</th>
<th>Improvement Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Breast Cancer</strong></td>
<td>All patients with stage I – III breast cancer, starting 1 year from their new patient office visit and ending two years after their completion of active treatment</td>
<td>Post-treatment follow-up care comprises a significant and increasing percentage of patients seen in the outpatient clinic setting. Improvement opportunities for this patient population center around ensuring follow-up visits and imaging are scheduled in an appropriate, cost-effective manner while maintaining access for new patients.</td>
</tr>
</tbody>
</table>
| **Physician:** Barbara Smith, MD, PhD  
**Nursing:** Theresa McDonnell, NP, ACNP  
**Administrative:** Mara Bloom, JD  
**Project Management/Process Improvement Consultant:** Gianna Wilkins, Allison Tuma | | |
| **Heart Failure** | Patients with a primary discharge diagnosis of heart failure (HF), focusing on patients admitted to cardiac floors Ellison 10 and 11 | Coordination of care, communication among caregivers, patient and family education and engagement for the longitudinal care of HF patients can be improved. In addition, the CMS Readmission Reduction Program includes heart failure patient. |
| **Physician:** Marc Semigran, MD  
**Nursing:** Judy Silva, RN; Cris Bethune, RN  
**Administrative:** Jamie Breed  
**Project Management/Process Improvement Consultant:** Priya Vader | | |
| **Kidney Stones** | Kidney stone patients divided into “episodic” and “chronic” patient groups | Standardization of practice and development of an integrated renal stone program. |
| **Physician:** Brian Eisner, MD; Dianne Sacco, MD  
**Nursing:** Mary McDonough, RN  
**Administrative:** Tom Finn  
**Project Management/Process Improvement Consultant:** Joan Strauss | | |
| **Pain Management** | Opioid tolerant patients [>= 60mg of morphine or its equivalent], due to their long average LOS, infrequent pain service consultants and length of time to request a pain service consult | One-on-one interviews and a survey were conducted with clinicians across different services (Medicine, Surgery, Neurology, Ortho, ED, Pedi, etc.) to gain a better understand of their challenges to manage pain. This information will be used to identify improvement opportunities and interventions. |
| **Physician:** Padma Gulur, MD  
**Nursing:** Patricia Fitzgerald, RN  
**Administrative:** Libby Williams  
**Project Management/Process Improvement Consultant:** Sanjay Chaudhary | | |
Readmission Reduction

<table>
<thead>
<tr>
<th>Steering Committee</th>
<th>Team Leaders</th>
<th>Patient Population</th>
<th>Improvement Opportunities</th>
</tr>
</thead>
</table>
| **Physicians:** Walter O’Donnell, MD; Ryan Thompson, MD; Gwen Crevensten, MD  
**Nursing:** Jessica Smith, RN, CNS  
**Administrative:** Rhodes Berube  
**Project Management:** Meghan Magee | There is an opportunity to improve coordination / communication, patient education / engagement for the longitudinal care of patients.  
The CMS Readmission Reduction Program assesses a penalty to hospitals with higher-than-expected 30-day, all cause readmissions rates for Medicare FFS patients.  
The Readmission Reduction Steering Committee is focusing on coordinating post-discharge communication (example: First Call for patients following discharge) and readmission awareness. | In addition, each task force is developing disease-specific interventions based on overarching readmission reduction framework (below):  
• Identification and risk stratification of patients on admission  
• Patient/family/staff education  
• Standardized clinical care  
• Transitional care and bridging the gap between the inpatient admission and outpatient care |
| **AMI Task Force**  
**Physicians:** Ken Rosenfield, MD; Stephanie Moore, MD  
**Nursing:** Chelby Cierpial, RN  
**Administrative:** Janet McClintic  
**Process Improvement:** Pratik Rachh | | |
| **COPD Task Force**  
**Physicians:** Paul Currier, MD; Fiona Gibbons, MD  
**Clinical:** Michael Sullivan, DPT, PT  
**Administrative:** Christine Kaliris  
**Process Improvement:** Joan Strauss | | |
| **Heart Failure Task Force**  
**Physician:** Marc Semigran, MD  
**Nursing:** Judy Silva, RN; Cris Bethune, RN  
**Administrative:** Jamie Breed; Harold DeMonaco  
**CQS Consultant:** Priya Vader | | |
| **Pneumonia Task Force**  
**Physician:** Josh Metlay, MD  
**Nursing:** Michele Anastasi, RN; Monica Staples, RN  
**Process Improvement:** Maryellen O’Dea | | |
Data and Analytics Development

In the spring of 2013, the Center for Quality and Safety Applied Informatics Group (AI) was asked to consider developing an analytic platform to support the Mass General/MGPO Care Redesign Teams. The vision was that the Care Redesign Teams would be able to directly interact with the data to identify areas for improvement and track the effects of the change thereby shortening the cycle between identification of an opportunity and implementation of the improvement(s).

AI benchmarked five products against the two institutional business intelligence platforms, Cognos and Microstrategy, looking for a tool that supported a rapid development cycle and minimal overhead knowing EPIC and the Enterprise Data Warehouse were going to be implemented. In addition, the platform needed to allow for the analysts and clinicians to have a tool that was as easy to use as Excel. Analysts tested the five products and found that Tableau was the easiest to implement and required the least amount of technical support to adapt to the changing data requirements.

The decision was made to move forward with purchasing Tableau to support the Mass General and MGPO care redesign efforts.

DEVELOPMENT CYCLE

The software and hardware were purchased and on site by the first week in July, at which time development started. Between July and October 2013 two business intelligence applications were built. Initial work was done contracting with Tableau to build the applications. After several weeks it was determined that it was easier to do the development internally.

A platform has been built to support identification of the top 10 areas for opportunity and an ad hoc platform. Standard definitions and calculations have been applied to the data model. Navigation tools have been built to further limit the clinicians need to understand how to navigate the software. Training has been built and initiated.

TABLEAU DEVELOPMENT TEAM MEMBERSHIP

Karen Lynch
Terry Arcudi
Chris Simone
Fang Qian
Mass General/MGPO is using Tableau to identify opportunities for Care Redesign. The box plot (top right) illustrates the total direct cost for the top 10 diagnosis for CY 2013. The Care Redesign Tableau application allows users to remove outliers, change the standard deviation, and replace diagnosis. The chart (bottom right) outlines troponin utilization by length of stay day. Data has been generalized for broad publication.
When launching Care Redesign in 2010, Partners also introduced “Value Dashboards” to the system to track performance and monitor the teams’ progress. Employing concepts and ideas promulgated by Professor Michael Porter and Robert Kaplan at Harvard Business School, the dashboards were designed to measure value — the outcomes for a particular condition or cohort, over the costs to achieve those outcomes.

Mass General/MGPO has modeled its Care Redesign dashboards in a similar fashion, and employ them to report quarterly to teams and leadership mortality, returns to hospital [Readmissions and Emergency Department visits], and resources use (cost, length of stay, etc.), for all waves of care redesign. Mass General also includes added measures of patient perceptions of care to ensure the patients voice is also being monitored with a goal of maintaining or improving performance. Finally, Mass General/MGPO customized the dashboards to also include measures specific to each team’s effort, so for example, OR turnover times, or PACU Length of stay. Creating these dashboards entailed countless iteration with the Care Redesign teams to hone in on condition/procedure/cohort definitions, develop and adopt measures, locate data sources and program reports and review test data. Partners designed and continues to produce the dashboards for the first wave of teams, and Mass General has expanded dashboard reporting; Wave II dashboards are designed and reporting is quarterly, Wave III dashboards are being finalized, and Wave IV dashboards are in development and represent a significant foray into measuring value for patient cohorts, outpatients, and/or episodes of care.

### DASHBOARD DEVELOPMENT WORKFLOW

- **Define Population**
- **Define Key Performance Indicators**
- **Add Team Specific Measures**
- **Feedback Loop**
- **Choose Metrics and Generated Reports**

### Dashboard Metrics
- Volume (ex: # Encounters)
- Outcomes (ex: Mortality rate)
- Resource use (ex: Estimated direct cost/case)
- HCAHPS (ex: Overall hospital rate)
- Team specific measures (3-5 measures)

### Dashboard Collaborators
- Lawrence Center for Quality and Safety Analytic Team
- Care Redesign Consultants
- Care Redesign Teams
- Care Redesign Leadership
The Care Redesign Dashboard (below) is an example for Transplant (cost data have been generalized for broad publication). Each dashboard includes a supporting page which shows trend charts for key metrics.

### Transplant Care Redesign Team

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>VOLUME</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>No. of Patients</td>
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<tr>
<td>Inpatient Days</td>
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<tr>
<td><strong>RESOURCES</strong></td>
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<td>Value of Resources</td>
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<tr>
<td>Volumes</td>
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<tr>
<td><strong>SUMMARY</strong></td>
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<tr>
<td>Total Costs</td>
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<td>Total Reimbursements</td>
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<td>Estimated Direct Cost</td>
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<tr>
<td>Estimated Indirect Cost</td>
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<tr>
<td><strong>PERFORMANCE</strong></td>
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<tr>
<td>MCAHPS Overall Hospital Rating</td>
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<tr>
<td>Team Specific Measures</td>
<td></td>
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</tbody>
</table>

*Projected volume for two quarters based on one quarter data.*

### Care Redesign Value Dashboard - TRANSPLANT

- **Current Time Frame**: Average Direct Cost Per Case
- **Trend**: Volume # of MRNs

- **Current Time Frame**: Top 5 Direct Cost Per Case
- **Trend**: 30 Day MGH Readmission Rate

- **Current Time Frame**: 30 Day Post Discharge MGH ED Visits Rate
- **Trend**: Mortality Rate

- **Current Time Frame**: Patient Experience: HCAHPS Overall Rating
- **Trend**: Overall Rating

- **Team Specific Measures**
  - Anti Microbials (Cost/Case)
  - Immunosuppressants (Cost/Case)
David Longworth, MD, keynote speaker for the Care Redesign Fair, learns about work of the Stroke Care Redesign Team.
We have a burning platform — the cost of health care is out of control and patient outcomes have room for improvement. We need to move from the current volume-based world to one that focuses on improving the value of care, and care redesign is the vehicle to help us achieve our goals of providing higher quality care at lower costs for our patients."

David Longworth, MD
Chair, Medicine Institute
Team Leader of the Value Based Care Initiatives Program
Associate Chief of Staff for Clinical Integration Development

Twenty multidisciplinary teams working to develop new ways to improve care and reduce costs in high stakes clinical areas showcased their initiatives during a September 4th Mass General/MGPO Care Redesign Fair. More than 150 people gathered under the Bulfinch Tent for the celebratory event, which featured a poster session outlining the work of the care redesign teams as well as the work of the Mass General Innovation Units. David Longworth, MD, chair of the Cleveland Clinic Medicine Institute and team leader of the clinic’s Value Based Care Initiatives Program, served as keynote speaker for the event. Longworth urged the audience to join other health care organizations across the country in embracing care redesign as an important way to position the Mass General and the MGPO for the future of health care. Following Longworth’s address, presentations were given by Mass General/MGPO senior leaders describing work under way, which, together with care redesign, will advance efforts in creating an affordable, patient-centered health care system for Mass General patients and their families. Presentations and a panel discussion with senior leadership capped off the program.
“Care Redesign improves the quality and efficiency of care, which leads to better patient experience, a better employee and support staff experience, and improves the value of care; it’s an incredible process. I am delighted the Care Redesign Teams had the opportunity to showcase their hard work and share their successes with the institution.”

Michael R. Jaff, DO
Director
Mass General/MGPO Care Redesign

Participants of the Care Redesign Fair panel discussion. Front row, from left: Moderator - Michael R. Jaff, DO, Director, Mass General/MGPO Care Redesign; Panelists: David Longworth, MD, Chair, Medicine Institute; Team Leader of the Value Based Care Initiatives Program, Associate Chief of Staff for Clinical Integration Development at the Cleveland Clinic; Elizabeth Mort, MD, MPH, Senior Vice President of Quality and Safety and Chief Quality Officer at Mass General and the MGPO; Jeanette Ives Erickson, RN, DNP, FAAN, Chief Nurse and Senior Vice President for Patient Care at Mass General; Timothy G. Ferris, MD, Medical Director, MGPO and Vice President Population Health Management, Partners HealthCare; Henry Chueh, MD, MS, Director, Laboratory of Computer Science and Chief of the Division of Biomedical Informatics at Mass General; Mary Cramer, Senior Director of Process Improvement at Mass General and Ambulatory Management and Performance at the MGPO; Back Row: Britain W. Nicholson, MD, Chief Medical Officer and Senior Vice President, Department of Medicine at Mass General; David F. Torchiana, MD, Chairman and Chief Executive Officer of the MGPO
“The number one goal for the Center of Quality and Safety is to improve quality in the areas that will distinguish Mass General and the MGPO, and Care Redesign is an integral part of the strategy to achieve that goal.”

Elizabeth Mort, MD, MPH
Senior Vice President
Quality & Safety
Ken Rosenfield, a physician leader of the AMI Care Redesign Team, advocates for his character during the group discussion of How Stella Saved the Farm: A Tale About Making Innovation.

Chris Trimble, associate professor at the Dartmouth Tuck School of Business and co-author of How Stella Saved the Farm, led the group discussion on how to advance innovation in Care Redesign.
Forty leaders from Mass General/MGPO Care Redesign teams gathered for a special event on Tuesday, September 10 to learn how to successfully implement innovation initiatives. The event included special guest speaker Chris Trimble, MBA, an associate professor at the Tuck School of Business at Dartmouth and The Dartmouth Center for Health Care Delivery Science. Mr. Trimble has dedicated more than ten years to studying how to execute an innovation initiative and is immersed in a multi-year effort to apply his work to the specific challenge of innovation in health care delivery.

Prior to the event, attendees received a copy of Mr. Trimble’s book, *How Stella Saved the Farm: A Tale About Making Innovation*, a light, quick and fun parable that explores the many challenges that innovation leaders face inside established organizations. Along with the book came a homework assignment: The group was asked to read the book prior to the event and adopt a character that they would embody for the group discussion during the event.

This thought-provoking event featured a lively discussion with each attendee advocating for why their character “saved the farm” and an engaging presentation from Mr. Trimble, who focused on providing practical tools and methodologies attendees could adopt to help successfully execute innovative ideas.

During the event, participants learned practical tools and methodologies for moving innovation forward in Care Redesign initiatives.
In March 2010, Mass General and MIT Operations Research formalized a collaboration aimed at developing new analytical methodologies and data-driven scientific approaches to system design and improvement of complex, high-cost clinical environments in a large academic hospital and to adapt Operations Research and Operations Management disciplines to these settings. The outcomes of this academic research collaboration include: decision support tools (tradeoffs), simulation optimization tools (predictions), and new system design (business practices).

Beginning in the Mass General Perioperative Services, the Mass General - MIT Collaboration was formed under the leadership of Ann Prestipino, senior vice president, Peter Dunn, MD, executive medical director of the Mass General Operating Rooms, and Bethany Daily, senior administrative director of Perioperative Services.

The MIT side of the collaboration is led by Retsef Levi, PhD, the J. Spencer Standish (1945) Professor of Management, associate professor of Operations Management at the Sloan School of Management.

Under Dr. Levi’s guidance are operations research or management postdoctoral fellows and interns from the MIT Leaders in Global Operations (LGO) program who are pursuing a joint MBA/master’s in Engineering.

Types of projects addressed by the collaboration to date include:

- Development of predictive tools, both operational and clinical
- Care redesign
- Systematic patient flow and resource allocation

In 2013, due to the overwhelming success of the Mass General-MIT collaboration, the collaboration expanded beyond Perioperative Services through a Request for Proposal process. Collaboration leadership received 11 highly qualified proposals and, after careful review and consideration, four proposals were selected to be core Mass General-MIT collaboration projects. In addition to the four selected core projects, a number of the other submissions will be supported through affiliated resources or folded into ongoing collaboration work.
Mass General-MIT Collaboration: Project History

2006 - 2009

PACU ANALYSIS
Test validity of a queuing model's ability to predict the observed distribution of patients in recovery and on waitlist.

ELEVATOR STUDY
Assess how moving the admission center from Wang 3 to 12 will impact the surgical ICU.

PATA
Minimize patient wait times while maintaining current throughput in PATA.

2010

OPEN BLOCKS
Reduce the number of waitlist cases exceeding the maximum wait times by allocating open blocks into the OR block schedule.

BLOCK ALLOCATION
Smooth the bed census across the week by reallocating the OR block schedule.

PACU ANALYSIS AND MODEL DEVELOPMENT
Develop a model to simulate current state and effects of clinical policies and operational process changes in the PACU.

ICU PATIENT FLOW
Develop a model that demonstrates patient flow through the SICU and primary downstream units and analysis of potential interventions.

INTRA-DAY CASE SCHEDULING
Improve intra-day case operating room scheduling by determining an optimal sequencing of cases, intra-day management of cases, and patient discharge process.

CSPS CUSTOM PACKS
Examine our CSPS production environment and mine newly available data to identify areas for improvement and optimization in our processes and service levels.

BED CAPACITY PREDICTIVE MODELING
Develop predictive modeling tool that uses all hospital/patient inputs/outputs to forecast hospital occupancy levels.

CSPS INVENTORY LOCATIONS
Examining our CSPS production environment and mine newly available data to identify areas for improvement and optimization in our processes and service levels.

2011

2012

2013

2014

UPCOMING COLLABORATION PROJECTS:
• CRITICAL CARE CENTER
• INSTITUTE FOR HEART, VASCULAR AND STROKE CARE
• CANCER CENTER
• LABOR & DELIVERY

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Clinical Innovation Awards:
Translating Clinical Insights into Improved Patient Care

The Clinical Innovation Award program has helped bridge the gap between new clinical evidence and current clinical practice. The award provided support to multidisciplinary teams with an interest in applying their knowledge and creativity to overcoming current barriers to effective and efficient clinical care. Over time, the Clinical Innovation Award program evolved to support research related to the implementation of clinical care redesign, patient affordability and trend management efforts at Mass General and MGPO.

With support from the Mass General Clinical Research Program, the Clinical Innovation Award was operated by the Mass General/MGPO Care Redesign program under the direction of Michael R. Jaff, DO, director of Mass General/MGPO Care Redesign. In 2013, the five projects in this chart were selected to receive $50,000 in grant funding through the Clinical Innovation Award program.

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>LEADERS</th>
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<tbody>
<tr>
<td>IMPACT (Improving Care After Chemotherapy): Implement follow-up calls</td>
<td>Theresa McDonnell, ACNP</td>
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<td>to patients with non-small-lung cancer or colorectal cancer receiving</td>
<td>Jennifer Temel, MD</td>
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<td>chemotherapy to discuss side effects and how to manage their symptoms</td>
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<td>Enhancing Shared Decision-Making for Patients with Acute Low Back Pain:</td>
<td>Leigh Simmons, MD</td>
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<td>Test whether using a patient education tool and clinical decision</td>
<td>Karen Sepucha, PhD</td>
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<td>support at the time of diagnosis for acute low back pain improves</td>
<td>Aligned with the Back Pain Care Redesign Team</td>
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<td>patients’ experience, outcomes and efficiency</td>
<td></td>
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<td>Remote Glucose Monitoring for More Efficient Insulin Titration in the</td>
<td>Nancy Wei, MD</td>
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<td>Patient-Centered Medical Home (PCMH): Assess the benefits of</td>
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<td>integrating remote glucose monitoring, through the Diabetes Connect</td>
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<td>platform, into the Mass General Diabetes Care Redesign insulin</td>
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<td>initiation/titration process</td>
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<tr>
<td>Improving the Health of Patients with COPD in the Integrated Care</td>
<td>COPD Care Redesign Team:</td>
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<tr>
<td>Management Program (iCMP): Implement interventions with COPD patients</td>
<td>Paul Currier, MD; Fiona Gibbons, MD; Michael Sullivan, DPT; Christine Kaliris; Joan Strauss;</td>
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<td>in the Integrated Care Management Program (iCMP), including patient</td>
<td>Sanjay Chaudhary; Ryan Thompson, MD; Joanne Kaufman; Mary Neagle</td>
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<td>education, care plans and exercise through a remote tablet monitoring</td>
<td></td>
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<tr>
<td>system</td>
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<td>Applying Systems Engineering and Improvement Science to the Mass</td>
<td>Benjamin White, MD</td>
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<td>General Emergency Department (ED): Utilize current systems engineering</td>
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<td>science to improve frequently utilized processes to reduce ED length</td>
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<td>of stay and patient care cost, and thus improve the value of care</td>
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<td>provided, focusing on the processes for urinalysis and plain film</td>
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<td>radiography</td>
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Collaborating with Future Innovation and Design Thinkers: Mass General/MGPO Care Redesign + Harvard Business School

In 2013, a partnership was formed between Mass General/MGPO Care Redesign and Harvard Business School (HBS). This distinctive partnership was developed under the leadership of Michael R. Jaff, DO, and Srikant Datar, PhD, Arthur Lowes Dickinson Professor of Accounting at Harvard University, focusing on engaging students in the HBS *Design Thinking and Innovation* course with the Mass General/MGPO Care Redesign initiative. Interested *Design Thinking and Innovation* students applied to work with Care Redesign teams, and eight were accepted. The students come from diverse backgrounds, representing not only the Harvard Business School, but also Harvard School of Public Health, Harvard Kennedy School of Government and the Harvard Graduate School of Education. Some of the students have backgrounds in clinical medicine while others bring experiences in the fields of technology, strategic consulting and global health.

The students’ engagement with Care Redesign has a two-pronged approach:

1. Each student is assigned to a Care Redesign Team. The student’s role with his/her assigned team is structured in a way to best meet the needs of the teams and the student. Opportunities for student engagement include, but are not limited to: data analysis, business planning, case study and publication development, and assistance with intervention planning. This effort will provide the students with a front-line team experience.

2. Each student is assigned an additional Care Redesign project focused on the overarching Mass General/MGPO Care Redesign initiative, providing the students with broad exposure to Care Redesign from a system level.

**Course Spotlight: HBS 1344 - Innovation & Design Thinking**

allows students to develop basic skills in creative problem solving and human-centered “design thinking.” Design thinking is a methodology that focuses on users and customers, their needs and wants, and produces solutions crafted to address those needs directly. Design thinking is most commonly associated with product design, but it can as aptly be applied to solving problems in processes, business models, management and strategy. Innovation and design thinking are relevant to students interested in entrepreneurship, but also to students seeking jobs in companies or firms.