Work Smarter to Prevent Readmissions – Point of Care is Key

Using Crimson Real Time to Prevent Readmissions
Road Map

1. Readmission Prevention Challenge
   - Case Study: Robert Wood Johnson University Hospital Hamilton

2. Conclusion
Crimson Real Time Readmissions

An Obvious Place to Focus

Data Show Readmissions Are Frequent, Preventable, and Costly

Alarmingly Frequent
Percentage of Medicare Patients
Readmitted within 30 Days

Highly Preventable
Percentage of Readmissions among Medicare
Patients Considered Preventable

Enormously Costly
Readmissions as a Proportion of Total
Medicare Spending, 2005 ($ billions)

Medicare Readmissions Program is a Highly Visible
Quality Indicator for Regulators and Peers

FY 2013
• 1% of Medicare revenue at risk
• Private payors expected to follow

FY 2015
• 3% of Medicare revenue at risk
• CMS adds COPD, THA and TKA to the list of penalized categories

FY 2018
• Increased adoption of accountable payment models adds teeth to penalties

Source: Clinical Advisory Board
Medicare Financial Penalties to Increase Five-Fold from 2013 to 2015

Impact of Penalties Already Widespread

- **66%** Hospitals that will face some penalty
- **$280 million** Total expected losses by US hospitals next year

**Medicare Financial Penalties**
- **FY13**: $281
- **FY14**: $572
- **FY16**: $675

**Additional Payer Penalties and Denials**

**Accountable Payment Models**

**Total Readmission Losses**

**Worst Case Future State for a Subpar 250 Bed Hospital**

- **$1,021K** Medicare Penalties
- **$950K** Additional Payer Penalties and Denials
- **$975K** Accountable Payment Models
- **$2,956K** Total Readmission Losses

The Ominous Memo in Your Inbox

*Quote from CFO at Hospital in Ohio*

“To be honest, the memo notifying us that our payments for readmissions could be denied by one of our private payers came as a surprise. While Medicare has been relatively slow with its penalty program, private payers can act quickly and unilaterally. The discussion about our changing financial dynamics was certainly a challenging one to have with our board.”
The Real End Game is Improved Quality of Care and Financial Outcomes

Reasons to Act Go Beyond Payment Penalties

The Majority of Institutions Have Already Taken Action

Not Participating in Initiatives

Participating in Initiatives

New Care Delivery Models

- Value Based Purchasing Program
- Medicare Shared Savings Program
- Medicare Bundled Payments for Care Improvement Initiative
- Accountable Care

Care Quality

Primary Motivation to Act

- Improving Quality of Care
- Avoiding Penalties
- Increasing Bed Capacity
- Increasing Scrutiny from Public Sources
- Other

Transparency

Increasing Scrutiny from Public Sources

Capacity Constraints and Improved Margins

Average DRG Payment

- Medicare.gov

The New York Times

THE WALL STREET JOURNAL

Source: Health Care Advisory Board
Current Approaches Full of Flaws

Key Obstacles Blocking Success

Existing Approaches Are Inefficient

Admission

Low Value: Manual Chart Review and Prioritization

Discharge

“I need a prioritized list of patients, including the crucial social elements”

“I need risk specific interventions as early as possible in the hospital stay”

And Current Solutions Are Insufficient

- ‘Gut Instinct’ Risk Stratification
  - Patients at risk for readmission are identified based on care team instinct
  - Interventions determined according to past experience

- Manual, Paper-Based Surveys
  - Surveys at admission or during stay look for a small set of key risk factors
  - Assessment designed for documentation and retrospective analysis

- Simple Automated Stratification Tools
  - Academic tools like BOOST or LACE designed on a global patient data set
  - Stratification conducted using a small amount of risk factors

Even when these flaws are resolved, a successful solution still needs targeted interventions and the ability to track impact
What If You Could Predict the Future?

Out of Industry Insight Key to Long Term Success

Today, across Many Industries, Predictive Modeling Is Integral to Success

Correctly Allocating Resources According to Demand

Avoiding Delays Before They Happen

Knowing about Big Life Events Before Your Family Does

Predicting What You May Want to Buy Next

An Innovative Approach to Predictive Analytics

1. Comprehensive Global Data
   - One in four inpatient admissions flow through Crimson every year
   - This data, coupled with a broad literature review, produces an optimal database for modeling

2. Customized Local Data
   - Model, however, is customized using local data from your own institution/market
   - This ensures that key local variances are integrated into the predictive analysis

3. Free-Text Analytics
   - State of the art free text analytics allows the model to capture unstructured data from notes
   - This captures hard-to-identify social risk factors

4. Adaptive Model Refinement
   - Regular model assessment means that analytics are always calibrated
   - Model algorithms are refined based on changes in the patient population
Impact Requires Knowing Both Who and Why

Scaling across patients & outcomes to identify salient risks & interventions

Proactive, Simultaneous Identification of 'Who and Why'

- Early warning score for onset of sepsis
- Candidate for palliative care consult, reduce ICU LoS
- Risk of CLABSI due to duration and femoral line
- High risk for 30-day CHF readmission because polypharmacy and cognitive decline
- At high risk for in-hospital mortality given spike in serum urea and atrial POC2 in COPD patient
Targeting Readmissions Key Metrics

RWJUHH is Targeting Crucial Metrics to Drive Success

- Working with Premedex to improve call-backs
- Automating information to Premedex
- Monitoring HCAHPS for responsive improvements

- Adding EMR prompts to improve intervention tracking
- Creating EMR communication supports
- Joining pharmacy to daily readmission huddle

- FMEA for readmission opportunities
- Working on moving to risk prioritization
- Tracking readmissions by DRGs

- Getting trial unit right and moving to spread
- Tracking interventions through EMR
- Monitoring tool utilization through CRTR
Road Map

1. The Readmission Prevention Challenge

2. Case Study: Robert Wood Johnson University Hospital Hamilton

3. Conclusion
Case Study: Robert Wood Johnson University Hospital Hamilton

RWJUHH Innovation Partner Project Overview

Delivery Process

<table>
<thead>
<tr>
<th>Welcome Call</th>
<th>Interventions Workshop</th>
<th>Live Site</th>
<th>User Acceptance Testing</th>
<th>Pilot Launch</th>
<th>Full Launch</th>
<th>Performance Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program overview, expectations, and implementation timeline</td>
<td>Web-based demonstration, UAT preparation</td>
<td>Initial end user education, formate launch strategy</td>
<td>Official release of CRTR and integration into care team workflow</td>
<td>Intervention planning and implementation, results tracking and reporting</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Summary of Progress to Date

- Readmissions application live in production since February 2013, expansion occurred July 2013
- 41 users have been trained and granted access to the application
- Pilot launched on TeleNorth to explore workflow integration
- Models validated and heavily utilized by champions on the pilot units

Model Validation (May-June)

<table>
<thead>
<tr>
<th>Risk Band</th>
<th>Total Patients</th>
<th>Readmitted Patients</th>
<th>Readmission Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>85</td>
<td>26</td>
<td>30.59%</td>
</tr>
<tr>
<td>Medium</td>
<td>127</td>
<td>21</td>
<td>16.54%</td>
</tr>
<tr>
<td>Low</td>
<td>212</td>
<td>21</td>
<td>9.91%</td>
</tr>
</tbody>
</table>

Care teams target 40% of readmissions focusing on 20% of pts
Multiple Factors Driving Readmission Reduction

Using the Readmission Diagnostic as a Starting Point

Avoid Medicare Readmissions Penalty
Heart Failure 30-Day Readmission Rate 2010

25%  
CMS National Average

29%  
RWJUHH

Deliver on Patient Care Mission
Care coordination provides better care, improves patient experience

Capitalize on Grant Opportunities
Robert Wood Johnson Foundation grant provided additional incentives to address readmissions

Mitigate Negative Margin Impact
Already tight operating margins at further risk if readmissions not reduced
A Team Makes All The Difference

RWJUHH Readmissions Team

Daily Unit Rounds Team
Case Study: Robert Wood Johnson University Hospital Hamilton

Labor Intensive, Limited Impact

Process Workflow Evaluation Reveals Opportunities for Improvement

Before: A Labor-Intensive Risk Identification Process with Limited Impact

Typical Process Prior to Implementing Crimson Real Time

- Patient targeted for follow-up based on judgment of nursing and case management: time delay between admission and identification
- Case Manager follows up with home health: fragmented data complicate coordination at care transition
- Case Manager researches patient using information available, faces time constraints and incomplete and siloed information
- Multidisciplinary rounds: often do not include all relevant specialties, miss high risk patients

Admission  Manual Chart Review and Prioritization  Limited Interventions  Discharge
<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Suggested Intervention</th>
<th>Start Grade Mar 2013</th>
<th>Grade June 2013</th>
<th>Stakeholder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>1. Provide disease education</td>
<td>D</td>
<td>nurse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Complete medication reconciliation</td>
<td></td>
<td></td>
<td>nurse</td>
</tr>
<tr>
<td>Medium Risk</td>
<td>1. Initiate social work assessment for psychosocial and financial factors</td>
<td>D-F</td>
<td>admitting nurse, social worker</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Provide disease education with Teach Back</td>
<td>D</td>
<td>nurse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Complete medication reconciliation with pharmacist</td>
<td>F</td>
<td>pharmacy director and Admin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Schedule PCP appointment within 7 days</td>
<td>F</td>
<td>unit secretary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Complete follow up phone call within 48 hours of discharge</td>
<td>F</td>
<td>3rd party vendor</td>
<td></td>
</tr>
<tr>
<td>High Risk</td>
<td>1. Initiate social work assessment for psychosocial and financial factors</td>
<td>D-F</td>
<td>admitting nurse, social worker</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2. Provide disease education with Teach Back for patient and caregiver</td>
<td>D</td>
<td>nurse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. Complete med reconciliation with pharmacist</td>
<td>F</td>
<td>pharmacy director and Admin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Provide prescription prior to discharge if possible</td>
<td>A</td>
<td>physician, nurse</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Consider home care</td>
<td>B</td>
<td>case management</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6. Schedule PCP appointment within 3 days of discharge</td>
<td>F</td>
<td>unit secretary</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7. Call PCP office notifying of high risk IP admission</td>
<td>F</td>
<td>n/a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8. Schedule outpatient follow up testing</td>
<td>F</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9. Complete follow up phone call within 24 hours of discharge</td>
<td>F</td>
<td>3rd party vendor</td>
<td></td>
</tr>
</tbody>
</table>
Implementing Data-Driven Readmission Prevention

Intervention Workshop Facilitates Best Practice Adoption

**Case Study: Robert Wood Johnson University Hospital Hamilton**

**New Process Supported by Crimson Real Time Readmissions**

- Care Manager uses Real Time predictive analytics on admission, creates targeted list of patients based on automated risk assessment
- Nursing uses disease specific education checklist with Teach-Back
- Pharmacy reviews medication reconciliation prior to discharge
- Warm handoff to home health or transitional care nurse
- Prioritized list of high-risk patients used for inter-disciplinary rounds: pharmacy included in rounding
- Care team, including PCP, notified of patient readmission risk score in EMR
- Unit secretary schedules follow up appointment
- Follow up calls in 48 hours after discharge

**Targeted Proactive Patient Care for High-Risk Patients**

- Discharge
- Admission
- Case Finding
## Interventions Key to Reducing Readmissions

### Moving the Grade to Success

<table>
<thead>
<tr>
<th>Risk Level</th>
<th>Suggested Intervention</th>
<th>Start Grade Mar 2013*</th>
<th>Grade April 2013</th>
<th>Grade May 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Risk</td>
<td>1. Provide disease education</td>
<td>D</td>
<td>D (Heart Failure A)</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>2. Complete medication reconciliation</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>Medium Risk</td>
<td>1. Initiate social work assessment for psychosocial and financial factors</td>
<td>D-F</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>2. Provide disease education with Teach Back</td>
<td>D</td>
<td>C</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>3. Complete medication reconciliation with pharmacist</td>
<td>F</td>
<td>F</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>4. Schedule PCP appointment within 7 days</td>
<td>F</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>5. Complete follow up phone call within 48 hours of discharge</td>
<td>F</td>
<td>F</td>
<td>A</td>
</tr>
<tr>
<td>High Risk</td>
<td>1. Initiate social work assessment for psychosocial and financial factors</td>
<td>D-F</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>2. Provide disease education with Teach Back for patient and caregiver</td>
<td>D</td>
<td>D (Heart Failure A)</td>
<td>C</td>
</tr>
<tr>
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<td>3. Complete medication reconciliation with pharmacist</td>
<td>F</td>
<td>F</td>
<td>C</td>
</tr>
<tr>
<td></td>
<td>4. Provide prescription prior to discharge if possible</td>
<td>A</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>5. Consider home care</td>
<td>B</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>6. Schedule PCP appointment within 5 days of discharge (suggested 3 days)</td>
<td>F</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>7. Place readmission risk assessment score in the SCM header (Call PCP office notifying of high risk IP admission)</td>
<td>F</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>8. Schedule outpatient follow up testing - on hold</td>
<td>HOLD</td>
<td>HOLD</td>
<td>HOLD</td>
</tr>
<tr>
<td></td>
<td>9. Complete follow up phone call within 48 hours of discharge (suggested 24 hours)</td>
<td>F</td>
<td>F</td>
<td>A</td>
</tr>
</tbody>
</table>
## Building the Infrastructure of Accountability

**Accountability Supported by Crimson Real Time Readmissions and EMR**

### EMR Solutions

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Information Bar</td>
<td>The Top Information Bar in EMR has patient readmission risk score for all care team to see.</td>
</tr>
<tr>
<td>Triggers</td>
<td>Triggers built in EMR to identify and track interventions by high, medium and low risk options.</td>
</tr>
<tr>
<td>Request Messages</td>
<td>Request messages go to individual care team members task lists for each intervention and EMR can track implementation of each intervention.</td>
</tr>
</tbody>
</table>

### Diagrams

- **Top Information Bar in EMR**
- **Select Interventions**
- **Care Team Task Lists**

**Case Study: Robert Wood Johnson University Hospital Hamilton**

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Lessons Learned and Getting to Spread

Reducing Barriers to Change

CRTR Unit

- Evaluate current practice and realign to best practice
- Intervention Workshop
- Set timeline for change
- Pick optimal unit to trial
  - Able to embrace change
  - Willing to lead charge
  - Likely to succeed

CRTR Units Tomorrow

- Evaluate, improve & hardwire processes, intervention skill sets and accountabilities
- Add next units to start spread
  - Use learnings from trial unit
  - Use infrastructure created
  - Pick similar units (embrace change, lead charge, likely success)
- Create infrastructure for best practice workflow
  - Process and system change
  - Tracking and measurement
  - Accountability
- Add all applicable units to CRTR
  - Continue to learn and adapt
  - Raise accountabilities
  - Hone and improve individual interventions

Patient Volume covered by CRTR

Time

Case Study: Robert Wood Johnson University Hospital Hamilton
Case Study: Robert Wood Johnson University Hospital Hamilton

About the Organization
- 250-bed hospital in Hamilton, NJ
- Crimson member since 2010

Challenge
- Hospital team recognizes performance gaps for AMI and Heart Failure patients
- Care transition gaps and disconnects recognized as major drivers of longer stays and high readmission rates

Solution
- Registered Nurse is hired as dedicated transition coach for AMI and Heart Failure cases
- Transition coach works with patients and families to promote compliance with post-discharge care, with focus on four pillars of care:
  - Medication management
  - Warning signs and symptoms
  - Personal health record
  - Follow-up with PCP

Impact
- Over 30% reduction in readmission rate for cardiac patients
- LOS reduction of over 500 annual inpatient days, amounting to $251k in annualized cost avoidance

Transition Nursing Services Improve Care for Cardiac Patients

From Discharge Instruction to Patient Education: Four Pillars for Better Care

Medication Management
- Medication reconciliation
- Promoting patient compliance

Warning Signs and Symptoms
- Educating patients and families to recognize symptoms and react accordingly

Personal Health Records
- Educating patients to track and document their symptoms and overall health

Follow-Up with Primary Care Physician
- Improve post-discharge follow-up care with PCP
- Promote long-term care plan and improved compliance

Significant Quality and Utilization Impact

Improving Quality of Care
30-day readmission rates (Any APR-DRG)

<table>
<thead>
<tr>
<th></th>
<th>H1 2011</th>
<th>H1 2012</th>
<th>H1 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Readmission Observed vs. Expected Ratio</td>
<td>25.07%</td>
<td>23.30%</td>
<td>17.48%</td>
</tr>
<tr>
<td>H1 2011</td>
<td>1.32</td>
<td>1.23</td>
<td>0.94</td>
</tr>
<tr>
<td>H1 2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 2013</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Impacting LOS Performance
Inpatient LOS Comparison (Days)

<table>
<thead>
<tr>
<th></th>
<th>H1 2011</th>
<th>H1 2012</th>
<th>H1 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Follow-Up</td>
<td>5.49</td>
<td>6.13</td>
<td>4.69</td>
</tr>
<tr>
<td>H1 2011</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 2012</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 2013</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

$251k
Annualized cost avoidance

1) AMI and Heart Failure cases, DRG 280-285, 291-293
2) Based on estimated cost of $500 per inpatient day

RWJUHH data as Crimson, Jan 2011 – June 2013
Road Map

1. The Readmission Prevention Challenge
2. Member Case Study: Robert Wood Johnson University Hospital Hamilton
3. Conclusion
Key Takeaways from Our Partnership

Moving from Data to Insight

1. **The Right Information Makes the Difference**
   - Get the right information to the point of care in order to kick start our efforts

2. **Start Small and Work Out the Kinks**
   - Set processes for targeted change and create the infrastructure for measurement

3. **Create Successful Partnerships**
   - Improve provider-patient communications to promote optimal care paths and support

4. **Plan Growth Wisely**
   - Expand use of CRTR throughout hospital and improve intervention skill set

Case Study: Robert Wood Johnson University Hospital Hamilton

Moving from Data to Insight
Real-Time Tools Support Broader Capabilities

Real-Time Automated Chart Review and Analytics Transforms Data into Targeted Actions

Data
- EMRs including inpatient, outpatient, and home care
- Ancillary systems, including laboratory, pharmacy, and radiology information systems
- Admission / discharge / transfer ("ADT") systems
- Billing and revenue cycle data
- Nonstandard data such as surveys, free text documents, etc.
- An EMR is not required, in full nor partial form. However, access to clinical and operational data is required for higher accuracy

Insight

Action
- Risk Quantification
- Risk Stratification
- Case Finding
- Care Coordination
- Care Pathways
- Data Validation
- Longitudinal Record
- Early Warning
- Reimbursement Justification
- Utilization Review
Achieving Clinical Cost Reduction

Delivering “Population Management” Inside the Four Walls

Automate

- Automate chart review for the simultaneous identification of risks across all patients
- Aggregate data from multiple sources and care settings to ensure a holistic view of patients

Predict

- Pull forward complete patient story, comprehensive patient and “sub-population” summaries
- Distill the most salient components of risk for various outcomes

Intervene

- Target specific patients with appropriate interventions to prevent negative outcomes
- Optimize resource allocation and avoid preventable cost escalation

An Invitation to Participate in an Executive Briefing

Explore Methods to Lower Average Cost per Case while Improving Outcomes

- Prioritize patients by risk for various outcomes in real time
- Trigger appropriate intervention based on the granular assessment of dominant risk factors, including psychosocial risks
- Contribute to and draw from an expanding catalog of best practice interventions & outcomes
- Access a growing, comprehensive library of outcome predictions (e.g. Early Warning Sepsis, Readmissions, Complex Case ID etc.)
- Utilize customized workflow support to ensure follow through
- Leverage “single source documentation” through EMR and/or case mgmt. system integration
- Demonstrate effectiveness through results tracking

To learn more about Dynamic Clinical Intelligence, please contact CrimsonRealTime@advisory.com
Presenters

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ABCo in Numbers

✓ 3,600+ healthcare organization memberships
✓ 2,200+ healthcare professionals employed
✓ 165,000+ healthcare leaders served by our Research and Insights
✓ $500+ million realized value per year from our Performance Technologies
✓ 1,300+ engagements completed from our Consulting and Management
✓ 6,200+ employee-led improvement projects with our Talent Development

RWJUHH in Brief

✓ 287-bed teaching hospital located in Hamilton Township, NJ
✓ Part of the Robert Wood Johnson Health Network
✓ Cancer Institute of New Jersey Hamilton, a cancer center on the hospital’s campus
✓ Malcolm Baldrige National Quality awardee
✓ Outstanding survey by The Joint Commission
✓ Specialty accreditation by The Joint Commission for knee and hip replacement, stroke and diabetes programs