Welcome to our Care Transitions Webinar

Thank you for joining. Our presentation will begin at 11am.

If you haven’t already, please dial in to the audio line:

888-895-6448  Passcode: 122-8904
A Call to Action – Targeting Sepsis to Reduce Readmissions

Presented in partnership by the ~
New England QIN-QIO &
Massachusetts Hospital Innovation Improvement (HIIN)
Chat in

Introduce yourself...

please type in your name, role, organization and state....
Today’s Speakers

Rebekah Gardner, MD
Senior Medical Scientist
New England QIN-QIO

Maryanne Whitney, RN, CNS, MSN
Improvement Advisor
Cynosure Health

Matthew J Schreiber, MD
Vice President - Hospital Quality & System Safety
Spectrum Health
Rebekah Gardner, MD
Senior Medical Scientist, New England QIN-QIO
Attending Physician, Rhode Island Hospital
Associate Professor of Medicine, Brown University

Setting the Stage
Readmissions matter

• Medicare uses readmission rates to measure quality
• Reimbursement penalties tied to readmissions for
  – Acute myocardial infarction
  – Heart failure
  – Pneumonia
  – Chronic obstructive pulmonary disease
Is something missing?

- 700,000 sepsis cases each year
- Costs $15-24 billion
- Human toll after sepsis
  - Increased mortality
  - Cognitive decline
  - Mental health suffering
  - Functional limitations
  - Decreased quality of life
Sepsis readmissions

Readmissions after a sepsis hospitalization are common

<table>
<thead>
<tr>
<th>National Readmission Data(^a)</th>
<th>Weighted Proportion of Cases in the United States</th>
</tr>
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<tbody>
<tr>
<td></td>
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<tr>
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</tr>
<tr>
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<td></td>
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<td>Sepsis</td>
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</tr>
<tr>
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Sepsis readmissions

12% of all readmissions followed a sepsis hospitalization

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<sup>a</sup>From the Agency for Healthcare Research and Quality. The Healthcare Cost and Utilization Project: National Readmission Database, 2011. Includes discharges from non-federal short-term acute care hospitals with an all-payer inpatient discharge data file. Does not include some discharge types such asipi and deliveries. Includes readmissions occurring within 30 days of discharge. Does not include readmissions that occur after a 30-day period (up to 1 year after the date of discharge). Any change in payer status will be identified as a new admission.

<sup>b</sup>Mean length of stay and mean costs are based on Medicare hospital cost report data for discharged patients. Cost data includes labor, supplies, services, capital, and other costs. Mean values for costs are based on non-missing cost data only. Costs include on-hospital costs in addition to off-hospital costs for patients with off-hospital stays.

<sup>c</sup>Primary analyses include patients with the diagnosis code for the disease listed in this row in their discharge data (International Classification of Diseases, 9th Edition, Clinical Modification or International Classification of Diseases, 10th Edition, Clinical Modification). Weights are based on the number of hospitals included in the survey. Standard errors are based on replicate weights, calculated using Taylor linearization. Weighted means are based on all patients in the survey and are not calculated for patients with missing values.
### Sepsis Readmissions

Sepsis readmissions have longer lengths of stay.

**Table: National Readmission Data**

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*Mayr et al, JAMA 2017.*
Sepsis readmissions

Sepsis readmissions cost more

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Sepsis readmissions

Important methods point: more opportunities to diagnosis sepsis on the index admission

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<tr>
<td>No. of All Index</td>
<td>Estimated Mean Cost per Readmission (95% CI), $b</td>
</tr>
<tr>
<td>Admissions associated with 30 d readmission</td>
<td>8242 (8225-8258)</td>
</tr>
<tr>
<td>Primary Analyses</td>
<td></td>
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Identified on any of the 10 discharge diagnosis fields

Identified only on the primary discharge diagnosis field
Sepsis readmissions

Loose sepsis definition
Tight AMI, HF, PNA, COPD definitions

Tight sepsis definition
Loose AMI, HF, PNA, COPD definitions

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<tr>
<td></td>
<td>12.2 (11.9-12.4)</td>
<td>1.2 (1.2-1.3)</td>
<td>6.7 (6.5-6.8)</td>
<td>5.2 (5.0-5.3)</td>
<td>4.6 (4.5-4.8)</td>
</tr>
<tr>
<td></td>
<td>7.3 (7.1-7.5)</td>
<td>1.8 (1.7-1.8)</td>
<td>20.0 (19.6-20.4)</td>
<td>11.1 (10.9-11.4)</td>
<td>17.4 (17-17.7)</td>
</tr>
</tbody>
</table>

Even so: sepsis is a leading cause of readmissions

Rough year

In the year following a severe sepsis admission . . .

• 44% of patients die

• Most readmitted
  – 27% within 30 days
  – 41% within 90 days
  – 63% within the year

• Only 20% of sepsis survivors alive and NOT readmitted
High facility use

- 34% in skilled care facility after discharge
- Patients spend median of 10% of days alive after discharge living in a facility
- Worse outcomes when readmitted
  - More ICU use
  - More hospice
  - More death

### Readmission diagnoses

#### Table. Most Frequent Readmission Diagnoses After Hospitalization for Severe Sepsis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Severe Sepsis (n = 2617)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of Survivors</td>
</tr>
<tr>
<td>Sepsis</td>
<td>167</td>
</tr>
<tr>
<td>Congestive heart failure</td>
<td>144</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>92</td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>87</td>
</tr>
<tr>
<td>Rehabilitation</td>
<td>74</td>
</tr>
<tr>
<td>Respiratory failure</td>
<td>65</td>
</tr>
<tr>
<td>Complication of device, implant, or graft</td>
<td>52</td>
</tr>
<tr>
<td>COPD exacerbation</td>
<td>49</td>
</tr>
<tr>
<td>Aspiration pneumonitis</td>
<td>47</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>44</td>
</tr>
</tbody>
</table>

Prescott et al, JAMA 2015.
Preventable diagnoses?

- Readmissions for any infection
  - 12% vs 8% non-sepsis patients
- More potentially preventable conditions than for non-sepsis patients
- Ambulatory-care sensitive conditions ranged from 22% to 42%
- Most readmissions within 15 days

Risk factors for return

• Younger age
• Medicaid insurance, lower income, urban
• More comorbidities
  – Malignancy
  – Anemia
• Sepsis severity NOT an independent factor
• Conflicting data
  – Male gender, Black or Native American

Local impact

Readmission rates following sepsis vs any condition
Local impact

Readmission rates following sepsis
Northern vs Southern New England
Local impact

Most frequent readmission diagnoses following sepsis

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sepsis</td>
<td>6 – 17%</td>
</tr>
<tr>
<td>Heart failure</td>
<td>1 – 4%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>1 – 3%</td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>1 – 3%</td>
</tr>
<tr>
<td>Urinary tract infection</td>
<td>1 – 3%</td>
</tr>
</tbody>
</table>
Future directions

New definitions

**Sepsis** → life-threatening organ dysfunction due to dysregulated host response to infection

**Septic shock** → subset of sepsis in which particularly profound circulatory, cellular and metabolic abnormalities substantially increase mortality

Future directions

Shift in old terminology and warning signs

• Big changes: No “severe” sepsis!
  No SIRS criteria!

• Infection with inflammatory response is normal and not necessarily sepsis

• Incorporates SOFA score and lactate
Future directions

New incentives and penalties

• Sepsis now in Hospital Readmission Reduction Program linked to pneumonia

• Adding principal discharge diagnosis of sepsis with secondary diagnosis of pneumonia present on admission
  – But not if coded as “severe” sepsis!

• Aspiration pneumonia also added
Diagnosis in evolution

How we define sepsis, how we code for it, how we’re paid for it, and how we’re penalized for it are all in flux
Maryanne Whitney, RN, CNS, MSN
Improvement Advisor
Cynosure Health

Strategic Sepsis Care
Strategic Sepsis Care

Massachusetts Health & Hospital Association
Maryanne Whitney RN MSN CNS
Improvement Advisor Cynosure Health
Sepsis: A Significant Healthcare Challenge

• Now recognized as a “Medical Emergency”
• Most costly reason for hospitalization in 2011
  – 20 billion in aggregate hospital cost
• 1 out of 23 patients in hospital had sepsis
• Major cause of morbidity and mortality worldwide
  – Leading cause of death in non-coronary ICU
  – 10th leading cause of death overall
• In the US, more than 700 patients die of sepsis daily
  – 1.6 million new cases per year
• **1 DEATH EVERY 2 MINUTES**
### Table: Length of Stay and Cost for Unplanned 30-Day Readmissions After an Index Admission for Sepsis, Acute Myocardial Infarction, Heart Failure, Pneumonia, and Chronic Obstructive Pulmonary Disease

<table>
<thead>
<tr>
<th>Condition</th>
<th>National Readmission Data</th>
<th>Weighted Proportion of Cases in the United States</th>
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<tr>
<td></td>
<td>No. of All Index Admissions Readmitted Within 30 Days</td>
<td>Estimated Mean Length of Stay (95% CI), d*</td>
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<tr>
<td>Admissions associated with 30 d readmission</td>
<td>1 187 607</td>
<td>6.4 (6.4-6.5)</td>
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<td><strong>Sensitivity Analyses</strong></td>
<td></td>
<td></td>
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<tr>
<td>Sepsis</td>
<td>89 800</td>
<td>7.6 (7.6-7.7)</td>
</tr>
<tr>
<td>Acute myocardial infarction</td>
<td>21 281</td>
<td>6.0 (5.9-6.1)</td>
</tr>
<tr>
<td>Heart failure</td>
<td>236 636</td>
<td>6.5 (6.5-6.5)</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>130 904</td>
<td>6.9 (6.9-7.0)</td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>201 867</td>
<td>6.3 (6.3-6.4)</td>
</tr>
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</table>
Success in Sepsis

- Detect
- Treat
- Transition
- Survive
Early Detection!

- Screen Every Emergency Patient
- Screen All Seriously Ill Adult Inpatients
  - Prioritize infections most frequently associated with sepsis
    - UTI, Pneumonia, Abdominal
- MEWs, early warning score to detect at risk patients for decline will capture more than just sepsis
  - Use the EMR for prompts, and alerts
- Treat all Elderly Patients as “High Risk”
  - May have atypical signs- Altered MS, Afebrile
Think SEPSIS!!!

Change Culture

Think Emergency!
Create Action: Bundle Implementation

- Identify clear and concise action for positive sepsis screen
- Who does what? By when?
- Build in concurrent review
• Mobilize resources
  – What are they?
• Mobilize experts
  – Who are they?
• Consensus in diagnosis
  – Allow for clinical decisions
  – Time sensitive
• Create action
  – Antibiotics
  – Labs
  – Fluids
• RRT
  – Can they be involved?
Positive Sepsis Screen = 3hr Bundle
(to be completed within 3 hours of presentation)

• Measure lactate level – not a send out
• Obtain blood cultures prior to administration of antibiotics
• Administer broad spectrum antibiotics with 1 hour
• Administer 30ml/kg crystalloid for hypotension or lactate ≥4mmol/L
Hypotension or Lactate > 4 = 6hr bundle
(to be completed within 6 hours of SEPTIC SHOCK presentation time)

- Apply vasopressors
  - for hypotension that does not respond to initial fluid resuscitation) to maintain a mean arterial pressure (MAP) ≥65mmHg
- Re-assess volume status and tissue perfusion and document findings
  - In the event of persistent hypotension after initial fluid administration (MAP < 65 mm Hg) or if initial lactate was ≥4 mmol/L,
- Re-measure lactate if initial lactate elevated.
Transitions

- ED- CCU
- ED- MS
- MS-CCU
- CAH to Regional facility
- Hospital- home
- Hospital to nursing home

- Communicate
- Communicate
- Communicate
  - Risk factors
  - Treatment
  - Time frame
  - Anticipate
**IMCP Severe Sepsis/Septic Shock Bundle Handoff/Checklist - 2014**

**Patient Name:**

**ECN:**

**DOA:**

--- **Time Zero** (ED admits = time of arrival. Floor admits = time of admission to ICU or IMC)

--- **Enter Patients Height**

--- **Enter "Time Zero" + 3 hours for ED patients or + 1 hour for other inpatient unit arrivals**

--- **Severe Sepsis Resuscitation Bundle**

**Goal:** to be done within a max. of 3 hours from **"Time Zero"** above or for non-ED patients within 1 hour from **"Time Zero"** above

1. Measure serum lactate. (If > 2, see #7 below)
2. Obtain blood cultures prior to antibiotic administration
3. Broad-spectrum antibiotic administration*: (see below) **Time started:**
4. Fluid bolus of 30 ml/kg PBW of crystalloid IV over 1 hour PRN MBP < 65 and/or Lactate ≥ 4 mmol/L

--- **Septic Shock Bundle**

- If low BP responds to fluid bolus permanently, continue to monitor and mark steps 5-6 "NA"
- If persistent hypotension after fluid bolus proceed to steps 5-7
- If MBP is ≥ 65 but initial lactate is ≥ 4, mark step 5 "NA" and proceed to steps 6-7
5. Administer Vasopressors (noradrenaline is preferred if not contraindicated)
6. Place central monitoring line and measure CVP and ScvO2 or use NICOM for further fluid resuscitation with goal of:
   - Central line: CVP ≥ 8 mmHg and ScvO2 ≥ 70%
   - OR NICOM: ≤ 10% increase in SVI with PLR and CI ≥ 2.5 L/min
7. If initial serum lactate is ≥ 2 repeat lactate within 6 hours (may be done before 6 hr.)

--- **Maintenance Bundle**

8. Stress-dose Steroids if on high dose or multiple vaspressors**
   - (Hydrocortisone 50 mg q8h or 200 mg as continuous 24 hour infusion)
   - (**High dose includes noradrenaline ≥ 0.3 mcg/kg/min or use of 2 or more vaspressors simultaneously)**
9. Mean glucose of 80-180 mg/dL by 24 hours checking glucose at least Q4 hours.
   - (Exceptions for compliance will be given if initial Glucose is > 400 mg)
10. If mechanical ventilated, target Vt at 6 mL/kg PBW (range 4-7 mL/kg PBW)

--- **Compliance Mnt within 24 hours**

--- **Enter the above "Time Zero" + 24 hours**

**Compliant?**

**Enter INTO EACH BLANK WHITE BOX ABOVE:** 

* = compliant, "N" = not compliant, or "NA" = not applicable

--- **Antibiotic Suggestions:** (Use of antibiotic suggestions is not required to meet compliance criteria)

- CAP: Ceftriaxone + azithromycin (preferred) or levofloxacin alone.
- HCAP: Zosyn (high dose) + levofloxacin + Vancomycin if MRSA risk
- Urosepsis: Ceftriaxone or If Pseudomodons suspected Zosyn or Ceftazime
- Surg. Site: Cefazolin or Vancomycin in MRSA suspected
- Intra-abdominal: Levofloxacin + Flagyl or Zosyn or Ceftriaxone + Flagyl

--- **This Form Is Not a Part of the Permanent Medical Record**

7/28/2016
Complications in Sepsis

- Acute Kidney Injury
- Post Intensive Care Syndrome
  - Weakness & balance
    - 50% of pts with sepsis in ICU
  - Cognitive
    - Thinking and memory
  - Mental Health
    - PTSD
- Health Care Associated Infections
- Antibiotics
New Ideas Emerging

• Early PT vs. Usual care
  — positive effects on quality of life
  — increased anti-inflammatory markers
  — trend toward reduced hospital anxiety

• Sepsis post-discharge
  — special multi-disciplinary outpatient clinic for screening and targeted interventions

• Examine
  — quality of life, readmissions and overall healthcare use, mortality, and cost
Resources

• Surviving Sepsis Campaign  http://www.survivingsepsis.org
• http://www.sccm.org/Research/Quality/Pages/Sepsis-Definitions.aspx
mwhitney@cynosurehealth.org
Matthew J Schreiber, MD
Vice President
Hospital Quality and System Safety
Spectrum Health

Reducing Readmissions in Practice
Reducing Readmissions in Practice

Massachusetts Hospital Association
Sepsis Webinar
March 9, 2017
Matt Schreiber: Disclosures

• I am supported by AHA-HRET for my time

• I have no financial relationships with industry or research partners
Hospital Readmissions Reduction Program

- [https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html](https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/AcuteInpatientPPS/Readmissions-Reduction-Program.html)

- Included diagnoses:
  - AMI
  - PN—CAP, Aspiration PN, Sepsis pts with PNA POA [severe excl]
  - HF
  - COPD
  - THA/TKR
  - CABG [FY’17]

- Pure penalty program with up to 3% payment risk

- MA tied for 5th worst state performance in 2016 [17.9%]
  ([https://www.bostonglobe.com/metro/2016/10/11/revolving-door-mass-hospitals/1JqWYNf8n01ZbtrEx3VTBK/story.html](https://www.bostonglobe.com/metro/2016/10/11/revolving-door-mass-hospitals/1JqWYNf8n01ZbtrEx3VTBK/story.html))
Increasing Public Awareness of Need for Hospital Improvement

- Preventable readmissions are seen as medical mistakes by the government and by the public.

- An average of 195,000 people in the USA died due to potentially preventable, in-hospital medical errors in each of the years 2000, 2001 and 2002, according to a new study of 37 million patient records by HealthGrades. [http://www.healthgrades.com](http://www.healthgrades.com).

- If the CDC’s annual list of leading causes of death included medical errors, it would show up as number six, ahead of diabetes, pneumonia, Alzheimer's disease and renal disease.
A Deceptively Simple Formula

Hospital Staff, Patient, and Family/Friend Must:

• Know the diagnosis
• Know key tests and treatments performed
• Know what the treatment plan [meds, appts]
• Know red flag symptoms, common side Effects/Failure points.
• Know who/how to contact if something is not going well
Typical Discharge Process

- Complex process involving multiple disciplines
- Discharges can be urgent & unplanned with pressure to cut length of stay
- Time constraints on clinicians who educate, prepare patients for transition
- Poor Communication with PCPs:
  - Direct communication between hospital physicians and primary care physicians occurred infrequently (3%-20%).
  - Availability of a discharge summary at the first post-discharge visit was low (12%-34%)
  - Discharge summaries often lacked important information such as diagnostic test results (missing from 33%-63%), treatment or hospital course (7%-22%), discharge medications (2%-40%), test results pending at discharge (65%), patient or family counseling (90%-92%), and follow-up plans (2%-43%)
  

- Unsafe discharges are an under-recognized significant issue that has heretofore received almost no attention from health care providers

*Lost in Transition: Challenges and Opportunities for Improving the Quality of Transitional Care.* Coleman EA. *Ann Intern Med.* 2004;140:533
Top 10 Evidence-based Interventions

1. Begin enhanced assessment of discharge needs and discharge planning on admission
2. Assess risk of readmission – align interventions to patient needs and risk
3. Accurate medication reconciliation at admission, at any change in level of care, and at discharge
4. Patient education with Teach-back– sensitive to patient’s culture and literacy--include diagnosis and symptom management, medication and post-discharge care needs
5. Identify primary caregiver (e.g., family member) and include in education and discharge planning
6. Use teach-back to validate patient and caregiver’s understanding
7. Send discharge summary & after-hospital care plan to primary care provider (PCP) by 48 hrs post-discharge
8. Collaborate with community based providers: nursing homes, rehabilitation facilities, long-term acute care hospitals, home care agencies, palliative care teams, hospice, medical homes, pharmacists
9. Before discharge, schedule follow-up appointments and tests / labs. For patients without a PCP, work with hospital-related clinics, health plans, Medicaid and safety-net programs to link patient to a PCP
10. Conduct post-discharge follow-up calls 48-72 hours of discharge; reinforce after-hospital care plan using teach-back, identify unmet needs, e.g., access to meds, transportation to follow-up appointments

See www.HRET-HEN.org
Evidence-based Change Packages

• Five change packages (bundles of interventions) have been shown to work in controlled trials—
  1) Coleman’s Care Transitions Intervention
  2) Jack’s Reengineered Hospital Discharge (Project RED)
  3) Evans’ early, systematic discharge planning
  4) Koehler’s pharmacist patient education, medication reconciliation, phone follow-up
  5) Naylor’s Transitional Care Model

• Individual parts of these change packages have not yet been proven to work by themselves—to increase likelihood of a beneficial effect, implement the whole bundle

On-line Care Transitions Resources

- **Project RED**

- **BOOST**

- **Eric Coleman**
  - [http://www.caretransitions.org/](http://www.caretransitions.org/)

- **STAAR**
  - [http://www.patientcarelink.org/Improving-Patient-Care/ReAdmissions/STate-Action-on-Avoidable-Rehospitalizations-Initiative-STAAR.aspx](http://www.patientcarelink.org/Improving-Patient-Care/ReAdmissions/STate-Action-on-Avoidable-Rehospitalizations-Initiative-STAAR.aspx)

- **Mary Naylor**

- **INTERACT**
  - [http://www.interact2.net/](http://www.interact2.net/)
Medication errors and preventable adverse drug events (ADEs) are a very serious cause for concern. Defined as any injury due to medication, ADEs are common...at least 1.5 million preventable ADEs occur each year.

- **Hospital**: 380,000-450,000 preventable ADEs/year
  - These are likely underestimates
- **Ambulatory Care**: 530,000 preventable ADEs per year among Medicare enrollees
  - Over 180,000 life-threatening or fatal ADEs per year, of which more than 50% may be preventable
- **Long Term Care**: 800,000 preventable ADEs/year.
  - This is “likely an underestimate”

Does not include errors of omission
Patient Implementation of Clinician Prescribing Intentions

- **Prescriptions**: 100%
- **Brought to Pharmacy**: 50% - 70%
- **Picked up**: 48% - 60%
- **Are Taken Properly**: 25% - 30%
- **First Refill**: 15% - 20%

Source: IMS
Pearls of Wisdom About Sepsis

• It’s not just about sepsis—improve whole house mortality
• Use of order set is key [set the default]
• Consider high lactate or IOS as RRT
• Be aggressive about fluids
• Focus on ER, change paradigm in hosp/ICU
• F/U lactate in 6 and 24* hr
• Antibiotic in 60min from ID, sooner the better
Key Takeaways

• Sepsis is a top diagnosis for readmissions
• Approach to sepsis remains systematic early detection and treatment to improve survival
• Currently no evidence-based interventions focused on post-sepsis transitions
• Recommendations...
  – Implement care transitions best practices and focus on good sepsis care
  – Share what works
Let’s Chat... Panel & Participant Discussion

Moderated by: Rebekah Gardner, MD
Senior Medical Scientist
New England QIN-QIO
Upcoming sessions that may be of interest...

3/14: Getting SMART - Antimicrobial Stewardship Across the Continuum

3/23: Lessons Learned from a Southwestern Vermont Transitional Care Program

3/28: Tools, Tips & Techniques - Implementing Outpatient Antibiotic Stewardship

Visit our event page: healthcarefornewengland.org

Future Medication Safety Lunch & Learn Sessions

5/9: Anticoagulation in the Ambulatory Setting - Clinical Guidelines and Protocols
5/23: Best Practices in Care Transitions for Patients with Anticoagulants
7/11: Maintaining Glycemic Control
7/25: Tools and Tips to Enhance Safe Care Transitions for Type II Diabetics
Interested in learning how you can partner to reduce readmissions, contact your QIN-QIO or local HIIN
Connect with the New England QIN-QIO on Social Media!

New England QIN-QIO

Under contract with the Centers for Medicare & Medicaid Services (CMS), the New England Quality Innovation Network—Quality Improvement Organization (NE QIN-QIO), administered by Healthcentric Advisors in partnership with Qualidigm, is serving all six New England states – Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

Across the region, the New England QIN-QIO works with healthcare providers, stakeholders and communities on data-driven quality initiatives to improve patient safety, engage patients and families and improve clinical care at the community level.

www.healthcareformewengland.org

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