MAURY REGIONAL MEDICAL CENTER

July 22, 2018

Mr. Vincent Davis
Director
Health Care Facilities
665 Mainstream Drive, Second Floor
Nashville, Tennessee 37243

Dear Mr. Vincent:

Please consider the enclosed application ***Infection Prevention, Antimicrobial Stewardship and Rapid Response in Southern Middle Tennessee SNFs*** submitted by the Maury Regional Health Post-Acute Care Network for funding via the Civil Monetary Penalty Quality Improvement program. In early 2018 Maury established a Post-Acute Care Network (PACN) that includes 17 middle Tennessee Skilled Nursing Facilities with whom we share patients in common. Agencies signed preferred provider agreements, formalizing our relationships to partner on improvement efforts and "raise all boats" with regard to safety, quality and patient experience. Maury is a natural convener for this partnership – having been recognized with numerous quality awards and innovating with lean improvement methodologies to guide system improvement.

In calendar 2017, Maury discharged patients to SNF or swing beds after 2,250 inpatient or observation encounters with 623 patient readmissions from the same. We continue to be challenged with higher than expected readmission rates after an episode of pneumonia, for which sepsis is the most frequent cause. Moreover, 25% of readmissions from SNF for patients with an original index hospitalization for pneumonia happen within 4.5 days and 50% within just over seven days of index discharge (2017 Maury data).

We have engaged key leaders with a track record of performance improvement to design this proposal. Through this partnership, we will enable SNFs with access to services that they would otherwise likely not have. We aim to field iterative education, deploy a clinical pharmacist to guide antimicrobial stewardship, and use innovative virtual care to enable a rapid response team to assist local SNF caregivers when they first assess a patient's deterioration.

Outcome measures, principally 30day all cause readmissions from SNF, will be augmented by return on investment analysis that relies heavily on cost avoidance – the unnecessary return of patients from SNF to hospital. We will also track numerous in-process measures to evaluate these tests of change and make course corrections in real time.

We are very confident that this proposal has merit because it is a balanced approach, engages experts in partnership, and because this demonstration should justify service continuation both by SNF leaders and the Maury accountable care organization because it lowers total costs of care while enhancing patient safety. Thank you for consideration.

Sincerely,

Mark Kirschbaum, PhD, RN
Vice President, Population Health
mkirschbau@mauryregional.com

# REQUEST

Date of Application: 07 / 23 / 2018
MM / DD / YYYY

## PART I: Background Information

Name of the Organization: Maury Regional Medical Center

Address Line 1: 1224 Trotwood Ave

Address Line 2:

City, County, State, Zip Code: Columbia, TN 38401

Tax Identification Number: 62-6002623

CMS Certification Number, if applicable: 44 – 0073

Medicaid Provider Number, if applicable: 44 – 0073

Name of the Project Leader: Mark S. Kirschbaum, Phd, RN

Address: 1224 Trotwood Avenue

City, County, State, Zip Code: Columbia, TN 38401

Internet E-mail Address: mkirschbau@mauryregional.com

Telephone Number: 931 – 380 – 4001

Mobile Number: 409 – 594 – 8437

Have other funding sources been applied for and/or granted for this proposal? ☑ Yes ☐ No

If yes, please explain/identify sources and amount.

In a USDA Distance Learning and Telemedicine Grant proposal, we applied only for a pilot of six of the network Skilled Nursing Facilities to outfit them with virtual care carts (if awarded, we will reduce accordingly).

## PART II: Applicable to Certified Nursing Home Applicants

Name of the Facility: 13 regional Skilled Nursing Facilities belong to the Maury post-acute network

Address Line 1: (list available on request)

Address Line 2: _____

City, County, State, Zip Code: _____

Telephone Number: ☐☐☐ – ☐☐☐ – ☐☐☐☐

CMS Certification Number: ☐☐ – ☐☐☐☐

Medicaid Provider Number: ☐☐ – ☐☐☐☐

Date of Last Recertification Survey: ____ /____ /_____
MM DD YYYY

Highest Scope and Severity Determination: (A – L) _____

Date of Last Complaint Survey: ____ /____ /_____
MM DD YYYY

Highest Scope and Severity Determination: (A – L) _____

Currently Enrolled in the Special Focus Facility (SFF) Initiative? ☐ Yes ☐ No

Previously Designated as a Special Focus Facility? ☐ Yes ☐ No

Participating in a Systems Improvement Agreement? ☐ Yes ☐ No

Administrator's Name: _____

Owner of the Nursing Home: _____

CEO Telephone Number: ☐☐☐ – ☐☐☐ – ☐☐☐☐

CEO Email Address: _____

Name of the Management Company: _____

Chain Affiliation (please specify) Name and Address of Parent Organization: _____

_____

Outstanding Civil Money Penalty? ☐ Yes ☐ No

Nursing Home Compare Star Rating: _____ (can be 1, 2, 3, 4 or 5 stars)

Date of Nursing Home Compare Rating: ____ /____ /_____
MM DD YYYY

Is the Nursing Home in Bankruptcy or Receivership? ☐ Yes ☐ No

If an organization is represented by various partners and stakeholders, please attach a list of the stakeholders in the appendix.

**NOTE:** The entity or nursing home which requests CMP funding is accountable and responsible for all CMP funds entrusted to it. If a change in ownership occurs after CMP funds are granted or during the course of the project completion, the project leader shall notify CMS and the State Agency within five calendar days. The new ownership shall be disclosed as well as information regarding how the project shall be completed. A written letter regarding the change in ownership and its impact on the CMP Grant application award shall be sent to CMS and the State Agency.

## Part III: Project Category

Please place an "X" by the project category for which you are seeking CMP funding.

- [X] Direct Improvement to Quality of Care
- [ ] Resident or Family Councils
- [ ] Culture Change/Quality of Life
- [ ] Consumer Information
- [ ] Transition Preparation

☐ Training

☐ Resident Transition due to Facility Closure or Downsizing

☐ Other: Please specify _____

_____

## Part IV: Funding Category

Please specify the amount and place an "X" by the funding category.

Amount Requested: $ 928,980.74

| | |
|---|---|
| ☐ $2,500 or less | ☐ $10,001 – $25,000 |
| ☐ $2,501 – $5,000 | ☐ $25,001 – $50,000 |
| ☐ $5,001 – $10,000 | ☒ Over $50,000 |

## Part V: Proposed Period of Support

**From:** 01 (MM) / 01 (DD) / 2019 (YYYY) (e.g. 06/01/2010) **To:** 11 (MM) / 30 (DD) / 2021 (YYYY) (e.g. 12/01/2010)

## Part VI: Purpose and Summary

### PROJECT TITLE

Include a cover letter to the State Agency Director with the application. The cover letter should introduce your organization, explain the purpose of the project and contain a summary of your proposal. The letter should include the amount of funding that you are requesting, the population it will serve, and the need it will help solve. Make a concerted effort to bring your project to life in the cover letter and actively engage the reader.



Mich Shuff 7/23/2018

**ATTACHMENT 2**

**GRANT BUDGET**

**(BUDGET PAGE 1)**

**ADDITIONAL IDENTIFICATION INFORMATION AS NECESSARY**

**APPLICABLE PERIOD: The grant budget line-item amounts below shall be applicable only to expense incurred during the period beginning DATE, and ending DATE.**

| POLICY 03 Object Line-item Reference | EXPENSE OBJECT LINE-ITEM CATEGORY [1] (detail schedule(s) attached as applicable) | GRANT CONTRACT | GRANTEE PARTICIPATION | TOTAL PROJECT |
|---|---|---|---|---|
| 1 | Salaries[2] | $860,385.00 | $0.00 | $860,385.00 |
| 2 | Benefits & Taxes | $0.00 | $0.00 | $0.00 |
| 4, 15 | Professional Fee/ Grant & Award [2] | $4,700.00 | $0.00 | $4,700.00 |
| 5 | Supplies | $0.00 | $0.00 | $0.00 |
| 6 | Telephone | $0.00 | $0.00 | $0.00 |
| 7 | Postage & Shipping | $0.00 | $0.00 | $0.00 |
| 8 | Occupancy | $0.00 | $0.00 | $0.00 |
| 9 | Equipment Rental & Maintenance | $0.00 | $0.00 | $0.00 |
| 10 | Printing & Publications | $0.00 | $0.00 | $0.00 |
| 11, 12 | Travel/ Conferences & Meetings[2] | $4,000.00 | $0.00 | $4,000.00 |
| 13 | Interest [2] | $0.00 | $0.00 | $0.00 |
| 14 | Insurance | $0.00 | $0.00 | $0.00 |
| 16 | Specific Assistance To Individuals[2] | $0.00 | $0.00 | $0.00 |
| 17 | Depreciation [2] | $0.00 | $0.00 | $0.00 |
| 18 | Other Non-Personnel [2] | $0.00 | $0.00 | $0.00 |
| 20 | Capital Purchase [2] | $59,895.74 | $0.00 | $59,895.74 |
| 22 | Indirect Cost (% and method) | $0.00 | $0.00 | $0.00 |
| 24 | In-Kind Expense | $0.00 | $0.00 | $0.00 |
| 25 | **GRAND TOTAL** | $928,980.74 | $0.00 | $928,980.74 |

[1] Each expense object line-item shall be defined by the Department of Finance and Administration Policy 03, Uniform Reporting Requirements and Cost Allocation Plans for Subrecipients of Federal and State Grant Monies, Appendix A. (posted on the Internet at: https://www.tn.gov/assets/entities/finance/attachments/policy3.pdf).

[2] Applicable detail follows this page if line-item is funded.

**ATTACHMENT 2 (continued)**

**GRANT BUDGET LINE-ITEM DETAIL**

**(BUDGET PAGE 2)**

| SALARIES | FTE | | Base | | Months | | Fringe | | AMOUNT |
|---|---|---|---|---|---|---|---|---|---|
| PAC Education Coordinator | 1 | x | $5,667 | x | 26 | + | $1,473 | 36 months | $185,640.00 |
| Clinical Pharmacist | 1 | x | $7,833 | x | 26 | + | $2,037 | 36 months | $256,620.00 |
| 24/7 RRT Critical Care RN | 4.2 | x | $6,250 | x | 15 | + | $1,625 | 28 months | $418,125.00 |
| ROUNDED TOTAL | | | | | | | | | $860,385 |

| PROFESSIONAL FEE/ GRANT & AWARD | AMOUNT |
|---|---|
| Training Materials | $1,450.00 |
| Training video production | $2,500.00 |
| Web programing | $600.00 |
| Web design | $150.00 |
| ROUNDED TOTAL | $4,700 |

| TRAVEL/ CONFERENCES & MEETINGS | AMOUNT |
|---|---|
| Travel & conference attendance fees for PAC Education Coordinator & Clinical Pharmacist - National Rural Health Association annual conference (or equivalent) | $4,000.00 |
| ROUNDED TOTAL | $4,000 |

| INTEREST | AMOUNT |
|---|---|
| SPECIFIC, DESCRIPTIVE, DETAIL (REPEAT ROW AS NECESSARY) | $0.00 |
| ROUNDED TOTAL | $0 |

| SPECIFIC ASSISTANCE TO INDIVIDUALS | AMOUNT |
|---|---|
| SPECIFIC, DESCRIPTIVE, DETAIL (REPEAT ROW AS NECESSARY) | $0.00 |
| ROUNDED TOTAL | $0 |

| DEPRECIATION | AMOUNT |
|---|---|
| SPECIFIC, DESCRIPTIVE, DETAIL (REPEAT ROW AS NECESSARY) | $0.00 |
| ROUNDED TOTAL | $0 |

| OTHER NON-PERSONNEL | AMOUNT |
|---|---|
| SPECIFIC, DESCRIPTIVE, DETAIL (REPEAT ROW AS NECESSARY) | $0.00 |
| ROUNDED TOTAL | $0 |

| CAPITAL PURCHASE | AMOUNT |
|---|---|
| Nova Pro Medical Cart (13 @ $1790) | $23,270.00 |
| Telemedicine Web Service Clinical System (13 @ $1790) | $11,635.00 |
| USB 3.0 4 Port Hub (13 @ $15) | $194.87 |
| Tablet (29 @ $821) | $23,806.97 |
| Omniflip Universal Stand | $988.90 |
| ROUNDED TOTAL | $59,896 |

Key Personnel Job Descriptions

The **Post-Acute Care Education (PAC) Coordinator** is a resource to network SNF educators to facilitate unit specific-orientation, in-service, competency, and continuing education of the nursing and support staffs as required by infection control regulatory accreditation and practice standards. S/he augments the local educator in educating, coaching, and monitoring the entire interdisciplinary team within each network SNF organization to ensure that, with respect to infection prevention, recognition and routine management, the resident is safe, and that practices are current and evidence-based. The PAC Coordinator partners with local SNF educators to develop and provide education for all disciplines related to hand hygiene and care of the patient with infection.

The **Clinical Pharmacist** works with network pharmacists, physicians/providers to monitor the network SNF residents' antimicrobial medications for efficacy, safety, appropriateness, and affordability. The Clinical Pharmacist is a resource to SNF partners in the weekly review of anti-infective (and related) medication orders and administration records and relevant laboratory and other relevant diagnostic results to ensure that the patients' plans of care are optimized.

The **Rapid Response Team (RRT) Registered Nurse** responds to alerts and, virtually, leads clinical evaluation and action upon SNF resident deterioration, and potential or actual bedside emergencies across the SNF Network. The RRT RN leads the virtual assessment of the resident and situation awareness through discussion with SNF caregivers and virtual assessment technologies. The RRT RN makes a disposition decision re: caring in place or recommending transfer to a higher level of care and coaches SNF caregivers in communications with SNF providers. Using approved, evidence-driven emergency protocols, the RRT RN directs the execution of diagnostic and therapeutic orders. After alert events, the RRT RN also leads debriefings with staff. The RRT RN provides follow up with patients transferred out of the SNF to reduce unplanned returns.

The **Telehealth Manager** is responsible for planning, designing, implementing, marketing, controlling, directing, coordinating, and evaluating the performance and status of all resources (hardware, software, bandwidth, etc.) of the Telehealth network throughout the Maury Regional Health System. Establishes policies and procedures for the Telehealth network. Develops and implements new areas of clinical utilization for Telehealth activities.

Biographical Sketches/Select Publications for Key Personnel

Mark Kirschbaum, PhD, RN, Project Director, authored this application and will provide project oversight. He is the vice president of population health and has 40 years of health care experience in management, education and clinical positions. Prior to joining Maury Regional Health, Mark served as the chief quality, safety and clinical information officer for two large academic health centers. He has significant experience facilitating lean improvement, including leading a consortium of 13 children's hospitals advancing outcome improvements and measures in child health.

Steinberger, D., Douglas, S., Kirschbaum, M. (2009). Use of FMEA for proactive identification of communication and handoff errors from organ procurement to transplantation. *Progress in Transplantation*. Sep;19(3):208-14; quiz 215.

Robbins JM, Kotagal UR, Kini NM, Mason WH, Parker JG, Kirschbaum MS. (2006). At-home recovery following hospitalization for bronchiolitis. *Ambulatory Pediatrics*. Jan-Feb;6(1):8-14.
Harder KA, Bloomfield JR, Sendelbach SE, Shepherd MF, Rush PS, Sinclair JS, Kirschbaum M, Burns DE. Improving the safety of heparin administration by implementing a human factors process analysis. In: Henriksen K, Battles JB, Marks ES, Lewin DI, editors. *Advances in patient safety: from research to implementation. Vol. 3, Implementation issues.* AHRQ Publication No. 05-0021-3. Rockville, MD: Agency for Healthcare Research and Quality; Feb. 2005.
Nordgren, L, Johnson, T, Kirschbaum, M, Peterson, M. (2004). Medical errors: Excess hospital costs and lengths of stay. *Journal for Healthcare Quality*, 26 (2), 42-48.
Kaissi, A., Johnson, T., Kirschbaum, M. (2003). Measuring teamwork and patient safety attitudes of high-risk areas. *Nursing Economics*, 21(5): 211-218.

Susan K. MacArthur Ed.D, MSN, FNP, RN-BC, the Director of Nursing Professional Development/Research/Magnet Program Director, Maury Regional Medical Center has experience as a school of nursing faculty member, director of a nursing program, clinical nurse specialist, nursing administration and is currently a reviewer for the AACN Pathway to Excellence program.

Lynnelle Murrell, RN, BSN, CIC, joined the staff at Maury Regional Medical Center in 2008. In 2011 she began the quest for zero hospital acquired infections as Infection Prevention Manager, and then became Director of Infection Prevention in 2013. A registered nurse since 1986, has worked in critical care, emergency department, home health, clinical research, and project management.

Zina Gugkaeva PharmD holds a Doctor of Pharmacy degree from Midwestern University. She completed acute care PGY 1 residency at the University of Iowa followed by PGY2 residency specializing in Infectious Diseases at the Jesse Brown VA Medical Center, Chicago IL. Select, relevant research publications reflect infectious disease expertise:

Gugkaeva Z, Crago JS, Yasnogorodsky M Next step in antibiotic stewardship: Pharmacist-provided penicillin allergy testing. J Clin Pharm Ther. 2017 Aug;42(4):509-512
Gugkaeva Z, Franson M. Pharmacist-led model of antibiotic stewardship in a long-term care facility. Annals of Long-Term Care and Aging. 2012; 20(10):22-6

Lesley Russo, Telemedicine Manager at Maury Regional Health, will lead all aspects of design and deployment of the proposed virtual network. She has previously successfully executed multi-year strategic plans with the Dept. of Veteran Affairs' overarching telehealth strategic plan resulting in operationalizing the Telehealth Expansion of Connected Care project. This project expanded medical access to veterans in the Tri-State area (TN, AR, & MS) resulting in a cost reduction of over $7M to the VAMC in Memphis, Tn. They managed a $2M budget through effective and collaborative oversight of a broad range of procurement, sourcing, and process improvement projects achieving recognition as the most operational program in the VA netwrk.

# GENERAL ASSURANCES

*Assurance is hereby provided that:*

1. This program will be administered in accordance with all applicable statutes, regulations, program plans and applications:
   a. The laws of the State of Tennessee;
   b. Title VI of the federal Civil Rights Act of 1964;
   c. The Equal Employment Opportunity Act and the regulations issued there under by the federal government;
   d. The Americans with Disabilities Act of 1990 and the regulations issued there under by the federal government;
   e. The condition that the submitted application was independently arrived at, without collusion, under penalty of perjury; and,
   f. The condition that no amount shall be paid directly or indirectly to an employee or official of the State of Tennessee as wages, compensation, or gifts in exchange for acting as an officer, agent, employee, subcontractor, or consultant to the Agency in connection with any grant resulting from this application.
2. Each agency receiving funds under any grant resulting from this application shall use these funds only to supplement, and not to supplant federal, state and local funds that, in the absence of such funds would otherwise be spent for activities under this section.
3. The grantee will file financial reports and claims for reimbursement in accordance with procedures prescribed by the State of Tennessee Department of Health.
4. Grantees awarded grants resulting from this application process will evaluate its program periodically to assess its progress toward achieving its goals and objectives and use its evaluation results to refine, improve and strengthen its program and to refine its goals and objectives as appropriate.
5. If applicable, the program will take place in a safe and easily accessible facility.

## CERTIFICATION/SIGNATURE

I, THE UNDERSIGNED, CERTIFY that the information contained in the application is complete and accurate to the best of my knowledge; that the necessary assurances of compliance with applicable state/federal statutes, rules and regulations will be met; and, that the indicated agency designated in this application is authorized to administer this grant.

I FURTHER CERTIFY that the assurances listed above have been satisfied and that all facts, figures and representation in this application are correct to the best of my knowledge.

07/23/18

Signature of Applicant Agency Administrator — Date Signed (Month/Day/Year)

Organizational Chart

In early 2018, the Maury Regional Medical Center (MRH) established a Post-Acute Care Network (PACN) of more than 13 Skilled Nursing Facilities and 10 Home Health agencies with whom we share patients in common. Agencies were asked to sign preferred provider agreements in formalizing our relationships in order to partner on improvement efforts and "raise all boats" for the quality, safety, and experience of our shared patients. Members of the network transparently share performance data (some of which is already publicly available). Two current workgroups of the PACN are focused on Quality (to guide the creation and/or refinement of metrics, structures and processes that facilitate achievement of expected outcomes) and Transitions (transfer structure and process to ensure that the most accurate, complete and timely information at hand off meets specific needs and occurs on a timely basis).


The PACN is overseen by a coordinating committee and ultimately functions under the direction of Maury's Accountable Care Organization with day-to-day operational direction by the Director of Population Health and Care Coordination. Each PACN committee operates under a defined charter with an established scope, defined tasks, and core members.

For this project, **Infection Prevention, Antimicrobial Stewardship and Rapid Response in Southern Middle Tennessee SNFs**, The PACN Quality Workgroup will review aggregated/summarized outcome and process measures, and RRT alert de-briefing summaries and provide general oversight and direct feedback in order to facilitate achievement of project objectives.

Project progress reports will be provided at quarterly Members Workgroup meetings.

TITLE: Infection Prevention, Antimicrobial Stewardship and Rapid Response in Southern Middle Tennessee SNFs

Abstract

Thirteen skilled nursing facility members of Maury Regional Medical Center's Post-Acute Care Network will be the focus of interventions to reduce healthcare associated infections and, ultimately, readmissions to hospital. Maury is a natural convener for the proposed work, recognized for quality and, as an innovator, that has embraced lean improvement methodologies to guide system improvement. Project team members have expertise in performance improvement, staff education, clinical pharmacy, population health, project management, and telehealth.

In calendar 2017, Maury discharged patients to SNF or swing beds after 2,250 inpatient or observation encounters. In the same year, we experienced 623 (27.6%) patient readmissions from the same. In spite of improvements with other diagnoses, Maury continues to be challenged with higher than expected readmission rates after an initial episode of pneumonia, for which sepsis was the most frequent readmission cause. Moreover, 25% of readmissions from SNF for patients with an original index hospitalization for pneumonia happen within 4.5 days and 50% within just over seven days of index discharge (2017 Maury data).

We propose fielding a coordinator with SNF experience (and Maury infection prevention department support) who will conduct intensive observation and assessment in order to identify contributing factors and engage SNF leaders in their remedy. Education, both virtual and in-person, will raise awareness and knowhow related to the early identification and goal-directed therapy for sepsis and healthcare associated infections..

We also propose an SNF-based clinical pharmacist to assist SNF providers to better effect antimicrobial stewardship. The clinical pharmacist will review/monitor antibiotics prescribed for residents on admission and at least weekly and communicating with providers and facility pharmacists regarding antibiotic management.

We will deploy a novel rapid response team (RRT) capability via virtual technology to assist local SNF caregivers assess and manage patients' deterioration. A SNF call, alerting the RRT of patient concerns, will prompt a "virtual" assessment followed by appropriate protocol-driven therapy.

Outcome measures, mainly stratified readmissions from SNF, will be augmented by a return on investment analysis, including cost avoidance to demonstrate intervention effectiveness. We will also track numerous in-process measures to assure that rapid cycle changes are undertaken and quick adjustments can be made if intervention tests of change are not delivering results. The project director, a principal in the PACN and senior leader with extensive measurement experience, will be accountable for completing the evaluation and advancing the sustaining model for SNF and Maury leadership.

Statement of Need

In 2017, using lean improvement methods, MRH began systematically addressing higher than expected hospital readmission rates for three patient populations: chronic obstructive pulmonary disease, heart failure and pneumonia (PN). While we have reduced performance at or near expected rates with the first two, we continue to be challenged with higher than expected pneumonia rates. We also identified that Sepsis (MS DRG 870,871,872) was the most frequent diagnosis for readmission encounters for patients with index hospital admissions for pneumonia and COPD.
2018 to date 272 patients left here, went to SNF, and returned within 30 days. This averages 38-39 per month

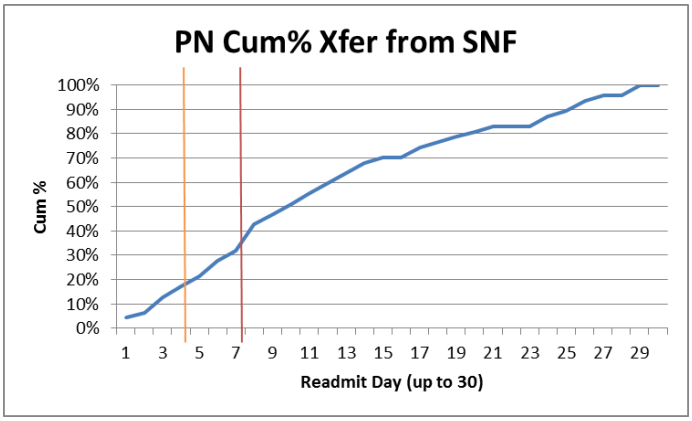



**Figure 1 SNFPneumonia readmissions by day 1-30 (25%, 505%)**

In order to identify a potentially "crucial" period for intervention post-discharge, we compared the timing of readmission. We stratified our analysis of readmissions during calendar 2017 by point of origin and discharge disposition. As exemplified in Figure 1, 25% of readmissions from SNF for patients with an original index hospitalization for pneumonia happen within 4.5 days and 50% within just over seven days of index discharge (2017 MRH data). Acknowledging that patients discharged to SNF are more complex and/or of higher risk than patients who discharge home and that complexity has grown over the past decade, we were still surprised to learn of this early return pattern given that patients were receiving direct care from professionals in a controlled SNF setting.

During the launch of the Maury Post-Acute Care Network (PACN), we requested a significant amount of comparative data from the SNF facilities with whom we share patients in order to identify levels of performance. For purposes of our review, we targeted 20% as a threshold for the 30 day hospital readmission rate. As shown in Figure 2, two of the partner facilities surpassed that. Three facilities either didn't maintain the readmission rate we requested or didn't respond in our request for information.

Figure 2 Readmission rates for SNF partners

| Skilled Nursing Facility | A | B | C | D | E | F | G | H | I | J | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
| baseline Referrals (count) | 76 | 115 | 165 | 50 | 291 | 5 | 22 | 239 | 155 | 123 | 130 |
| 30-day or episodic hospital % readmissions | 17 | 15.1 | 21 | 11.06 | 15.9 | 15 | 21 | 7 | 12.5 | 18.56 | 17.91 |

Three of the PACN SNF organizations received citations regarding infection prevention deficiencies (F0880 - Provide and implement infection prevention and control program) on last survey.

During fall, 2017 field interviews at PACN facilities, MRH leadership heard a few challenges that were fairly consistent from local SNF leadership teams relevant to this proposal. Establishing and maintaining staff proficiency in the caregiver team, and efficiently disseminating information and changes in policy, procedure, and practice expectations to an *around-the-clock* workforce were frequently shared. Many sites cited using computer-based learning, with a few common third party vendors, to educate and orient on service principles, clinical practice, and for some, the transmission of corporate goals, policies, and practices. Regarding transition communications, discharge summaries were not timely and too often when residents arrived from the hospital on an antimicrobial medication, both the reason the patient was prescribed (i.e. source of infection) and the expected completion date were routinely missing. A limited number of SNFs had access to the MRH electronic medical record (EMR) and found it helpful in searching required care information but that approach is both time-consuming and not universally available.

While the majority of PACN SNF partners have implemented INTERACT patient safety communication tools, only half of PACN members have 24/7 RN coverage so assessment competencies are limited. When SNF residents' condition deteriorates after hours and on weekends, it is not uncommon for a medical director to advise the nursing staff to send the patient to the emergency department and, invariably the patient is admitted rather than stabilized and returned.

Program Description

We propose a three-pronged focus to reduce the incidence and burden of healthcare associated infections: education, management of antibiotic stewardship, and deployment of a prototype virtual rapid response team.

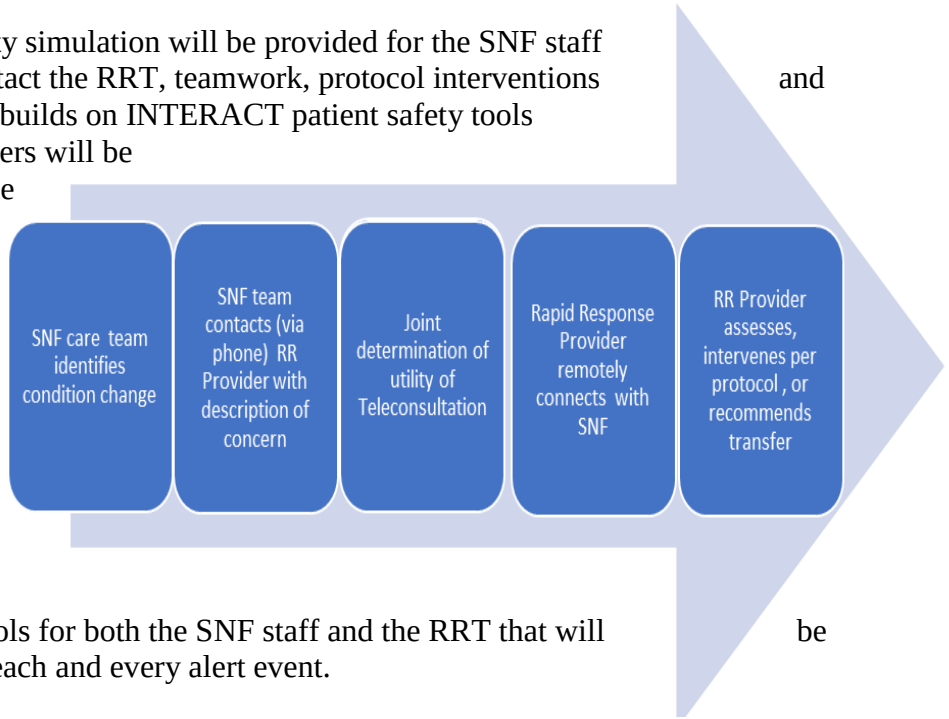
**Education:** A repeatable and replicable education curriculum will be focused on infection prevention and early recognition of sepsis in SNFs. A SNF Education Coordinator (SNFEC) will be responsible to develop the standard curriculum and collaborate with facility trainers to prioritize and provide programs. Each facility will appoint a trainer to integrate the program across all levels of staff (nursing, environmental services, dietary, etc.)
To increase effectiveness, education and support will be developed and revised via on-site baseline and ongoing SWOT (strength, weaknesses, opportunities, threats) assessments to interrogate infection prevention processes (e.g. catheter associated urinary tract infection prevention) and the facility environment. As well, guided root cause analyses of each infection-associated readmission during the project life will be completed, searching for process failures and contributing factors to developing sepsis,. With support from a MRH Infection Preventionist, the SNFEC and facility Trainer will use SWOT assessment results to target interventions that reflect both network-wide and locally-identified issues, concerns or barriers. Each facility will focus on at least one opportunity or threat from the SWOT to track and trend over the grant period.

To increase the capacity of the program, a scaffolding for education capitalizing on different modalities appropriate to the learning and participant ("Train the Trainer", live/interactive web-based sessions, computer based learning, on site programs, audits and consultation) will be deployed. An initial needs assessment of learners will be conducted. Pre-assessment and post-assessment of learning knowledge for each program will be conducted and evaluated as part of the outcome measures. Formative and summative assessments will be used to ensure each cycle of learning in the program builds the capability of the participants.
To meet the request of PAC network SNF leaders, "Train the Trainer" Sepsis and Infection Prevention education regarding the top risks to patients provided via teleconferencing with interactive Q&A and targeted to SNF educators. A web portal will be utilized to enable access to an online repository of continuous learning resources, programs and references.

**Antimicrobial Stewardship:** A clinical pharmacist in a consultative role will work with the facilities to promote antibiotic stewardship. This will be accomplished by reviewing antibiotics prescribed for residents at least weekly; providing necessary monitoring and communicating with providers and facility pharmacist regarding antibiotic recommendations/information. Education to the facility staff and providers on antibiotic stewardship based on role will be provided on an ongoing basis.[i]

**Virtual Rapid Response Team (RRT) Prototype**: To remedy SNF leader concerns in the PAC Network related to the preventable transport of residents to the MRH emergency department for lack of a confident caregiver or an on-site provider, we propose the adaptation of a proven approach: rapid assessment and protocol-based intervention by a seasoned RRT to assist and coach nurses and nurse technicians on the frontline providing care to the patient. During 2017, there were 194 transfers to MRH from SNF with just three healthcare associated infections – septicemia (the majority), cellulitis, or urinary tract infection – that, on average, had a 4 day hospitalization and totaled $ 4.8 million in annual charges. We have used these admissions as our best (low) proxy estimate of the number of RRT calls that might be expected (4 per week). Failure to recognize signs of deterioration in a patient can result in morbidity, transfer/admission to acute hospital care, and even mortality. Since 2004 the Institute of Healthcare Improvement has recommended RRT in acute care hospitals.
With the rise in acuity of the SNF patient there is a clinical need to provide this type of support to SNF nursing staff. A standard protocol for use by a RRT in SNFs exploiting virtual technology (including visualization and select peripherals like a stethoscope) will be deployed. Included in the protocol will be indications for notification of the RRT, definition of roles and a standard list of interventions the RRT can perform/order. PACN medical directors will be convened to review/revise hospital protocols that have safely been used at MRH for many years and SNF processes for sanction/approval will be pursued. In preparation for implementation of

the RRT, training and low fidelity simulation will be provided for the SNF staff and focused on warning signs to contact the RRT, teamwork, protocol interventions and communication that utilizes and builds on INTERACT patient safety tools familiar to the SNF. RRT providers will be trained on the use of telemedicine to conduct the assessment, remote communication techniques, teamwork and interventions. Logistics of deploying the prototype will be deliberated, likely with a single target site, then up to 5 select SNFs and, after sufficient experience, two additional waves of the network.




We will also adapt debriefing tools for both the SNF staff and the RRT that will be used to evaluate and learn after each and every alert event.

Figure 3 Communication Process - Concerning Deterioration/Distress/Event

Technology

Virtual technologies will be placed at both MRH and partnering SNF sites and each entity will use its own internet and network lines. These devices will connect to vendor software, which comply with HIPAA and FDA regulations for the transmission of health data and video conferencing. A secure environment will be established for technology acquisition and storage for this program.

MRH, as the hub site, will provide video conferencing carts, software, peripheral devices and training required to access and use the virtual technology. MRH will provide necessary antivirus and security software for the devices and ensure that data definition files are current. In addition, MRH will ensure that all critical updates and patches are current.

MRH will be responsible for installation and maintenance of the network infrastructure within the owned sites including, but not limited to, cabling located inside the walls of the structure and a secure communications closet space to house the networking equipment. MRH will require participating partnering SNFs, to be held to the same requirements. Both MRH and partners will be responsible for maintenance and on-going technical support for all data and voice wiring within the walls and ceilings from their respective data closets.

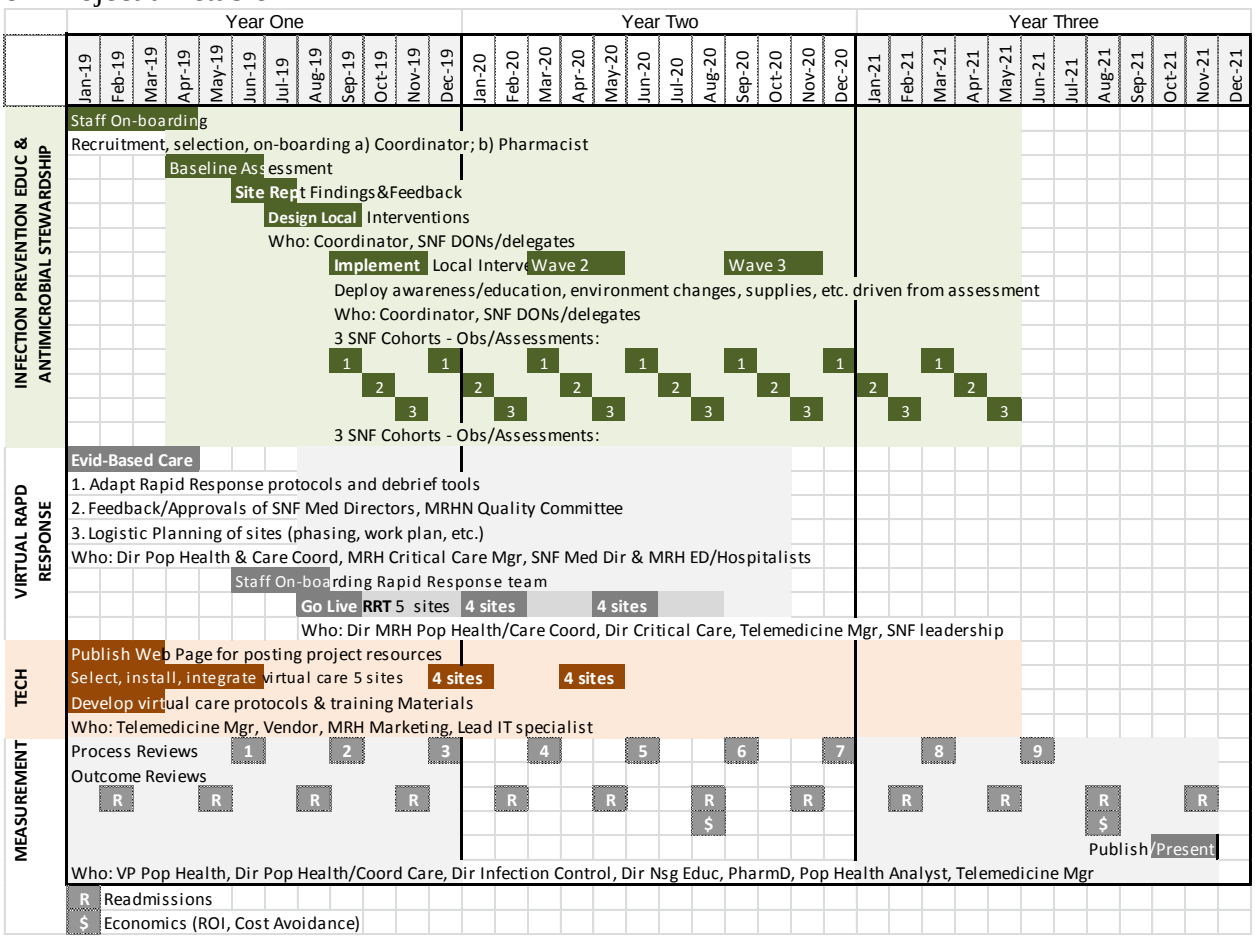
The standard virtual technology system will include a mobile medical cart with the ability to mount a tablet (monitor), drawers for supplies, diagnostic medical equipment, and a rechargeable battery. The tablet will be pre-loaded with necessary software, sound system, and high performance camera. Peripherals include a stethoscope and light source to optimize viewing and assessment. All of the equipment will be connected using a secure wired or wireless system. Virtual Technology will need the minimum of:

- A secure wired/wireless internet connection with at least 5 MB/sec up and down
- A full-duplex USB or Bluetooth-enabled speakerphone
- At least one high-performance >/= 19x optical zoom, low light, pan/tilt/zoom camera
- A high-definition web-cam capable of 1080p video
- An electronic stethoscope (e.g., Bluetooth or USB enabled) that allows for remote listening of heart, lungs, abdominal sounds
- A digital Otoscope to see the outer/middle ear, the eyes, mouth and throat

MRH, along with the vendor, will provide advisory technical support and training to PAC Network sites for the initial set-up video setup. MRH and vendor (per contract) will provide on-going technical support for software devices through an escalation process.

A standard contingency plan for equipment downtime (or failure) will be developed to ensure continuity of patient care during periods of loss equipment functions. In addition, a report shall be submitted to that designates criticality of application/system error, estimated impact, locations of equipment, and resolution immediately after the event.
MRH will develop a website dedicated to host infection prevention education module links to aid in continual training; resources and tools; invention/sepsis RRT protocols;. SNF staff will be expected to demonstrate competency in the function and use of the virtual technology. All technology guidelines governing operations will be provided to each site by MRH. Training to SNFs will be via MRH web portal for all technology, including patient exam peripherals.

Figure 4 Project timetable



Results Measurement

*Outcomes*

The ultimate outcome measure for this proposal will be Maury readmission data (stratified by MS-DRG with and without co-morbid infection or sepsis, day of week, time of day, etc.). MRH submits monthly patient EMR data to the Premier Quality Advisor comparative database which we have and will continue to use to routinely monitor CMS all-cause 30 day unplanned readmission. We are able to drill down to details for both index admission data as well as readmission encounters. We will monitor observed to expected rates of readmission stratified by MS-DRG and discharge disposition and compare it to historical data that we have previously gathered by individual SNF partner for over three years.

We will track project expenditures using standard MRH and SNF expenditure accounting and use MRH patient cost accounting and MRH and SNF patient charge information to evaluate costs associated with readmits and estimate cost-avoidance related to readmissions prevented and calculate return on investment using fully loaded costs and, if favorable, to prove sustainability and justify to MRH and SNF leaders continued support.

Using real-time readmission data (from daily EMR readmission module reporting), we will also post for feedback to SNF participants the elapsed days since a last readmission due to infection for the PAC Network and for each SNF. This simple time interval metric has been used in patient safety circles for some time as a simple feedback tool. MRH readmissions task force members will continue to intensively reviewed EMR data to complete detailed medical record readmission causal reviews and isolate contributing factors to preventable readmissions, using a format adapted from RARE[ii]

*Process*

Beginning this fall, 2018 MRH's new electronic medical record readmissions module employs predictive analytics to generate a readmission risk score. This not only guides hospital providers and care managers in appropriately discharge planning, but this risk score (BOOST) will be communicated as a part of the improvements in transfer information planned to raise consciousness of patient risk. The frequency that this information is routinely communicated at SNF transfer will be monitored.

MRH uses surveillance software (Vigilanz) to support antimicrobial stewardship which actively mines microbiology and antimicrobial medication data from the hospital electronic medical record. Antimicrobial surveillance monitoring data will be shared for SNF discharges and readmissions to further guide infection prevention and management. Prevalence of multi-drug resistant organisms will be documented. Utilization of the clinical pharmacist will be tracked by accounting for pharmacy interventions (e.g. the number of adjustments in drug/dose/etc.)

Each center will develop site-specific monitoring scorecard metrics for their unique chosen interventions to track and trend compliance (e.g. staff and visitor hand hygiene). Other standard process metrics tallies will include:

- INTERACT (e.g. *Stop and Watch)* standard safety tool use

- RRT alert response times; RRT and Caregiver debriefing evaluations for each activation using adapted de-briefing tools
- Training program participation/completion records.
- Test/retest knowledge/learning assessments before and after computer based education

The PACN Quality TF will review aggregated/summarized outcome and process measures, and RRT alert de-briefing summaries and provide general oversight and feedback in order to facilitate project objectives.

Benefits to Nursing Home (NH) Residents

As a result of the components of this proposal, SNF residents will first receive care in a culture that increasingly has much better daily disciplines for infection prevention. That is, staff at all levels will be much more likely to practice hand hygiene and to hold other staff and providers accountable for the same. Residents and their families will be encouraged to speak up to protect the resident and staff and providers will welcome their reminders. Environmental resources will be better aligned to prevent infection.

Residents will encounter staff who are uniformly knowledgeable (even shortly after hire) about hand hygiene, preventing infection, and identifying and escalating attention to signs that infection is worsening and putting the patient at risk.

While residents won't experience it directly, they will benefit from an expert clinical pharmacist's review of their medication profile and interacting with SNF providers to assure their safety. They will receive medications they should, won't receive medications that they shouldn't or are inadequate, and their safety will be monitored with drug blood levels, interactions and efficacy. This effort will be coordinated with providers and SNF pharmacists/suppliers in real time so that there the resident has no delay or interruption in therapy and the best antimicrobial action.

Residents will also experience a safety net when, in the event that they exhibit signs and symptoms of a worsening infection, their local caregivers can engage a RRT team in real time to speed action to timely intervention (that their own local medical director has previously approved by protocol).

Consumer/Stakeholder Involvement

SNF leaders are actively engaged in the work of the PACN. Quality and Transitions Task Force members exhibit the engagement that we also anticipate with this project. The education component, especially the "Train the Trainer" delivery is the direct impact of a PACN SNF administrator's recommendation for an approach designed to meet their ongoing needs. That administrator agreed to participate in the critical review of this grant proposal.

The design of the educational intervention is also grounded in observations and assessments of each unique SNF environment and tailoring the approach that best fits. This set of interventions will be authentic to PACN SNF needs and engage educators, both non-clinical and clinical staff, and will meet learner needs.

We anticipated also coordinating these efforts, including education of residents, with the SNF resident/family councils to better engage both residents and visitors in infection prevention, both their own ability and how to speak up with SNF staff.

All three elements of the proposal appeal to SNF leadership because they are not just effective but also both pragmatic and affordable. The use of virtual technology brings experts and resources to the learner and the caregiver. Deploying a clinical pharmacist extends the reach of providers and shortens the timeliness of medication management with a shared resource that is imminently more affordable. The RRT team brings knowledgeable nurse experts in real time across thirteen sites in a way that none would individually be able to afford.

Description of Support from Governing Body

At the spring, 2018 Member Workgroup meeting, we had a lengthy discussion of readmission reduction efforts from Maury specific to the SNF population. We announced our intention to develop this proposal for the PACN and seek funding to assist in site-based efforts. We received feedback specifically regarding ongoing education needs and the prospect of exploiting virtual technology to overcome barriers to provider assessment and visualization of residents after hours. These comments the outline of our proposed three-pronged approach were discussed with the MRHN Quality Committee and the MRHN Board (Maury's Accountable Care Organization). We received their endorsement for proceeding and, after involvement of the Maury finance department in an ROI modeling, we also received specific support of the Maury leadership team for required capital investments for virtual technology to support this effort.

Involved organizations: **13 members of the Maury PACN have agreed to participate:**

| Federal Provider Number | Provider Name | Provider Address | Provider City | Provider State | Provider Zip Code | F Name | L Name | Phone | Email |
|---|---|---|---|---|---|---|---|---|---|
| 445236 | LIFE CARE CENTER OF COLUMBIA | 841 W. JAMES CAMPBELL BLVD. | COLUMBIA | TN | 38401 | Cindy | Foster | (931) 388-5035 | cynthia_Foster@lcca.com |
| 445030 | NHC-MAURY REGIONAL TRANSITIONAL CARE CENTER | 5010 TROTWOOD AVE | COLUMBIA | TN | 38401 | Brandon | Whiteside | (931) 427-2143 | ardmore.ceo@healthservices.cc |
| 445117 | NHC HEALTHCARE, SCOTT | 2380 BUFFALO ROAD | LAWRENCEBURG | TN | 38464 | Jason | Jones | (931) 762-2267 | jjones@nhcscott.com |
| 445430 | LEWIS COUNTY NURSING AND REHABILITATION CENTER | 119 KITTRELL ST, PO BOX 129 | HOHENWALD | TN | 38462 | Celeste | Blocker | (931) 796-3233 | cblocker@thmgt.com |
| 445101 | NHC HEALTHCARE, PULASKI | 993 E COLLEGE ST | PULASKI | TN | 38478 | Doug | Wong | (931) 363-3572 | douglas.wong@nhc |
| 445180 | NHC HEALTHCARE, LAWRENCEBURG | 374 BRINK ST PO BOX 906 | LAWRENCEBURG | TN | 38464 | Darrin | McKamey | (931) 762-6548 | dmckamey@nhclawrenceburg.com |
| 445094 | NHC HEALTHCARE, LEWISBURG | 1653 MOORESVILLE HIGHWAY | LEWISBURG | TN | 37091 | Derick | Scott | (931) 359-4506 | derick.scott@nhccare.com |
| 445465 | SIGNATURE HEALTHCARE OF COLUMBIA | 1410 TROTWOOD AVENUE | COLUMBIA | TN | 38401 | Courtney | King | (931) 388-6443 | Cking@magnoliahcrehab.com |
| 445109 | NHC HEALTHCARE, COLUMBIA | 101 WALNUT LANE | COLUMBIA | TN | 38401 | Scott | Bidwell | (931) 381-3112 | scott.bidwell@nhccare.com |
| 445002 | NHC HEALTHCARE, OAKWOOD | 244 OAKWOOD DR | LEWISBURG | TN | 37091 | Ron | Vaden | (931) 359-3563 | rvaden@nhcoakwood.com |
| 445374 | MT PLEASANT HEALTHCARE AND REHABILITATION | 904 HIDDEN ACRES DR | MOUNT PLEASANT | TN | 38474 | Blaine | Lee | (931) 379-5502 | mtpleasant.ceo@healthservices.cc |
| | Wayne Medical Center Swing Beds | 103 JV Mangubat Dr. | Waynesboro | TN | 38485 | Tyler | Taylor | 931-722-5411 | tytaylor@mauryregional.com |
| | Marshall Medical Swing Beds | 1080 North Ellington Pkwy | Lewisburg | TN | 37091 | Phyllis | Brown | 931-359-6241 | pbrown@mauryregional.com |

Letters of Support
We have received 11 of 13 written letters of support by project submission deadline and verbal assent to the project by the other two, who just couldn't advance the letter in time. We have also received a letter of support from our QIO.
List of Subcontractors (if applicable): None
Letters of Commitment from Subcontractors (if applicable): None

[i] Gugkaeva Z, Franson M. Pharmacist-led model of antibiotic stewardship in a long-term care facility. Annals of Long-Term Care: Clinical Care and Aging. 2012;20(10):22-26.

[ii] July 2011. Adapted from: Rutherford P, Nielsen GA, Taylor J, Bradke P, Coleman E. *How-to Guide: Improving Transitions from the Hospital to Post-Acute Care Settings to Reduce Avoidable Rehospitalizations.* Cambridge, MA: Institute for Healthcare Improvement. June 2011.