Purpose
To be an active partnership model spreading lean culture transformation across healthcare organizations in the Carolinas.

Goals
- To achieve successful lean culture transformations in early adopter, leadership hospitals and healthcare systems by 2011.
- To spread lean healthcare transformation to other hospitals and healthcare sectors.
- Piloting Rural Hospital Lean Transformation Collaboratives engaging ten rural hospitals in Western and Eastern NC.

Western North Carolina Collaborative
- Ashe Memorial Hospital
- Blue Ridge Regional Hospital
- Caldwell Memorial Hospital
- Charles A. Cannon, Jr. Memorial Hospital
- The McDowell Hospital

Eastern North Carolina Collaborative
- Bladen County Hospital
- Columbus Regional Healthcare System
- J. Arthur Dosher Memorial
- Duplin General Hospital, Inc.
- Sampson Regional Medical Center

North Carolina Rural Health Center
Lean Management Outcomes

- The collaborative: conducted three, week-long training programs for hospital executives and managers (Executive Lean Training, Value Stream Analysis and Core Team Development) and organized Transformational Plans of Care for each of the five WNC hospitals to guide strategic implementation of the lean transformation project.

- The five WNC hospitals, working together, hired three Lean Transformation coordinators to manage the transformation for the hospitals, to conduct Rapid Improvement Events (RIEs) and to train hospital managers, executives, physicians and staff in the application of lean management tools, process improvement and value stream analysis.

- Partnered with NCHA, Simpler Healthcare™ and NC State University IES.

- In the first year, the Collaborative performed over 20 Rapid Improvement Events for three rural hospitals.

- 35 rapid improvement events are planned for the WNC Collaborative in the second year.

- The ENC Collaborative will begin to implement the lean transformation model in 2010.

- The hospitals are investing a minimum of $80,000 each annually to conduct the lean transformation process.

- The WNC Collaborative was featured at the NC/SC Rural Hospital conference in Nov 2009 and the IHI Quality Forum in Dec 2009.

- Sample operational outcomes:
  - $160K in ED supply charge recapture.
  - Increased to 70% the proportion of pre-registered imaging patients.
  - For ED patients: 35% reduction in laboratory turnaround time; 40% improvement in radiology process time; 50% improvement in time to initial treatment.
  - 50% improvement for inpatient bed preparation time.
  - 40% reduction in time for OR preparation.
**The Simpler Solution >**

**Carolinas Lean Healthcare Roundtable**
- 5 Hospital Collaborative in Western NC
- Shared resources and funding for lean transformation
- 20 RIEs held at 3 hospitals during Year 1
- Solutions developed in value streams including: Surgical Services, the Emergency Department, InPatient Flow, Radiology/Imaging, and Revenue Cycle

**Spread**
Over 150 Employees from all 5 hospitals engaged in RIEs during Year 1 spreading specific implemented ideas plus lean learnings.

**Savings**
Total Savings (both "hard" and "soft") for the 3 active hospitals in Year 1 exceeds **$2,554,000**.

**The Simpler Solution >**

**Caldwell Memorial Hospital**

**Surgical Services**
- Reduced OR turn around time by 42%
- 25% reduction in "touch time" for pre-op process

**InPatient Flow**
- Reduced room turn around time by 45 minutes per patient discharge
- Reduced time from discharge decision to patient leaves by 50%

**Revenue Cycle**
- Improved ED supply charge capture process by $160,000 (gross) annually
- Reduced ED account holds from >9 days to 4 days.

**Visual**

**Capacity**
Created an additional 11,000+ hours of in-patient capacity annually through improvements in the discharge process and room turn around time (156 minutes per patient d/c)
Charles A. Cannon Memorial Hospital

Emergency Department
- Reduced the time from when a Patient presents until Triage by 42%
- Time from Triage to 1st Intervention reduced by 60%
- Improved the flow of patients admitted from the ED by reducing the time from “admission decision” to "patient arrives on floor" by 79%

Lab
- Reduced the average Urine turn around time by 41 minutes.
- Reduced the average BMP/CMP turn around time by 34 minutes and the average CBC turn around time by 23 minutes.

Lean Enterprise Transformation

VS Metrics
Symptom Control metric has improved to 93.1% since the start of lean.

Urgent Patients are seen 61% faster than before lean transformation

Ashe Memorial Hospital

Imaging
- Reduced the percentage of patients who were seen 20 minutes later than their scheduled time from 44% to 7% (an 84% improvement)
- Increased the percentage of pre-registered patients by 72%
- Improved the average time for transporting an inpatient from the floor to Imaging by 80%
- Improved the average time for transporting an inpatient from Imaging to the floor by 70%
- The time from Patient arrival to seen by a Radiology Tech was reduced by 64%

Lean Enterprise Transformation
NC Rural Hospital Lean Culture Transformation Collaborative

Western NC Rural Hospital Lean Collaborative

Summary Results

July 2009

Introduction: Five rural hospitals in western North Carolina committed to a partnership to implement a lean culture transformation collaborative learning network. All five western NC hospitals have initiated their lean journeys and culture transformation principles are being instituted and sustained. Each hospital implementation is guided by a Transformational Plan of Care (TPOC) established by hospital leadership. The focused improvement areas for the three leadership hospitals are detailed below, along with process improvements and sustained achievements.

Ashe Memorial Hospital, Jefferson, NC:
Ashe Memorial Hospital’s TPOC highlighted an initial focus on Improving Patient Flow within the Imaging Department. Three rapid improvement events and an improvement activity focused on 6S have achieved the following process improvements:

1. Improved Clinical quality / interdisciplinary communication for patients by:
   a. Realizing a 60% reduction in transportation time of inpatients to and from Imaging through adherence to established standard work.
   b. Establishing a clear process to ensure compliance to regulatory handoff communication regarding the most current patient status between care providers.
   c. Establishing a review process with the Radiologist prior to the patient encounter to pre-determine the plan of care.

2. Reduced patient wait times and improved the overall flow of the Imaging Department by:
   a. Increasing the percentage of patients who are pre-registered to 70%. Determined a process in partnership with physician offices to facilitate a more efficient registration for the patient on the day of the procedure.
   b. Creating standard work for the Imaging technicians to make certain the delivery of care is consistent and “value add” time for the patient is maximized.
   c. Implementing a visual control system to make the operational status of the department transparent and abnormal conditions (i.e. an extended patient wait time) easy to identify.
   d. Implementing the discipline of a 6S workplace to ensure patient safety, enhanced quality outcomes and optimal patient flow.

3. Opened an additional value stream – Acute Care Nursing – in June 2009. The target state for this value stream is to “excel in the delivery of patient care while developing an optimal work environment for staff”.


Cannon Memorial Hospital, Linville, NC
Cannon Memorial Hospital's TPOC highlighted a focus on Improving Emergency Department Flow. Three rapid improvement events achieved the following process improvements:

1. Reduced average lengths of stay in the department and improved ED patient satisfaction by:
   a. Achieving a 35% reduction in turnaround times for the top 5 laboratory tests ordered.
   b. Realizing a reduction from 60 minutes to 28 minutes from when the patient presents in the ED to the first intervention / care delivery.
   c. Establishing a process for bedside registration that effectively reduced the time from patient presentation to triage from 12 minutes to 7 minutes.
   d. Realizing a 40% reduction in turnaround time for patients requiring radiology exams during their ED visit.

2. Improved Clinical quality / interdisciplinary communication for patients by:
   a. Implementing visual control systems to ensure ED patient status is transparent to those providing care regardless of their department leading to organizational “silos” being replaced by interdisciplinary care teams.
   b. Establishment of physician approved protocols for ED patients.

3. Instituting the standard work of daily leadership rounds to “model the way” for associates to continuously implement the lean culture in daily operations.

Caldwell Memorial Hospital, Lenoir, NC
Caldwell's TPOC highlighted three areas of focus: Improving Inpatient Flow, Improving Surgical Patient Flow and Revenue Cycle. Value Stream Analysis was adopted to develop tactical improvements. Caldwell Memorial conducted a series of rapid improvement cycles which achieved the following process improvements:

Inpatient Flow
1. Reduction of patient room turnaround at inpatient discharge from 90 minute average to 45 minute average by establishment and adherence to standard work. This has provided the following additional benefits:
   a. Reduced ED patient wait time for bed assignment
   b. Reduced post surgical patient wait time for bed assignment
   c. Reduced ED / Critical Care diversion hours
   d. Improved ED patient satisfaction
   e. Aggregate capacity improvement of 230 patient days ($398,750 net revenue) with no additional staff or rooms
2. Improved Clinical quality / interdisciplinary communication for patients by development and adherence to standard work, including:
   a. Establishment of daily rounding conference between Hospitalists, Case Management, and Nursing
   b. Establishment of a standard shift report mechanism for nursing

3. Improved clinical quality / documentation processes for
   a. Medication reconciliation
   b. Core Measures (AMI, HF, and Pneumonia)

Surgical Patient Flow
1. Implementation of a central scheduling process for surgical patient scheduling. The single point call has reduced redundant phone calls / fax transmissions for surgeon offices and hospital OR and registration personnel.

2. Reduction of OR room cleaning time by development of and adherence to standard work from 12 minutes to 7 minutes. This provides:
   a. Aggregate capacity improvement of 470 surgical hours (315 surgical cases / $1,100,000 net revenue) per year with no additional staff or rooms.

3. Reduction of pre-op preparation time for Outpatient surgical patients by development of and adherence to standard work from 45 minutes to 20 minutes. This has:
   a. Improved patient satisfaction by reducing patient wait times
   b. Ensured that patients are available to transport to the OR to keep up the additional capacity created by item 2) above.

4. Reduction of Pre-anesthesia interview processes by:
   a. Reduction of patient flow time by 14%, from 35 minutes to 30 minutes
   b. Reduction of chart preparation time by 94%, from 9-1/2 minutes to 35 seconds.

Revenue Cycle
1. Improved ED supply charge by capturing an additional $160,000 in gross charges per year:
   a. Reducing null transactions (supplies removed from supply cabinets without acknowledgement of supply use) by 85%. Valued at $11,000 / year
   b. Implementing a process to capture suture usage. Valued at $19,000 / year
   c. Implementing a daily reconciliation process to account for supplies currently charged to “floor stock” instead of a patient. Valued at $130,000 / year.

Additional, tangible improvements can be seen within our organization resulting from 6S activities (Sort, Straighten, Scrub, Safety, Standardize, Sustain). Work areas, corridors, and storage areas are visibly safer, more orderly, and free of clutter and supplies are organized in a much more accessible manner.
Purpose
To organize technical assistance and leadership for North Carolina's small, rural hospitals to improve clinical quality and patient safety.

Goal
Active development and organization of a partnership with the NC Office of Rural Health and the QIO for a small, rural hospital collaborative to support 28 small, rural NC hospitals improving care for heart failure and pneumonia patients, accomplishing 95% or better process reliability.
**CAH and Small, Rural Hospital Quality and Performance Improvement Portfolio**

- **CMS Core Measure Improvement (CHF care and pneumonia care)**
  - **Goal:** 95% process reliability
  - **Two improvement workshops annually**

- **Curriculum to Improve Board Governance of Quality**
  - **Board retreat for CAH and rural hospital trustees**
  - **Curriculum created by AHA Center for Governance**
  - **Goal:** Conduct Board retreat for 30 small, rural hospitals and CAHs

- **Conduct AHRQ Culture of Patient Safety Survey and Assessment**
  - **Arranged by NC Center for Hospital Quality in cooperation with Patient Safety Group**

- **Encourage participation in NC Center for Hospital Quality Collaboratives**
  - **Hospital Acquired Infection Prevention (SHIM)**
  - **CAUTI collaborative**
  - **Just Culture collaborative**
  - **Team STEPPS**

- **HCAHPS participation by 100% of CAHs**
Quality and Improvement Outcomes

- Based on CMS indicators for pneumonia and heart failure care and organizing reliable care processes.
- In partnership with NC Office of Rural Health, NCHA and CCM E.
- Commitment by 28 small, rural hospitals, including 18 CAHs.
- The collaborative achieved 173% improvement in pneumonia care performance and 102% improvement in congestive heart failure performance. Two NC CAHs in each core measure category are among the Top 10% performing hospitals in NC.
- The Quality Improvement Collaborative is acknowledged as a national model for CAHs.
- Promoted active rural hospital participation in the NC Center for Hospital Quality improvement collaboratives, such as surgical infection prevention and process reliability, the Hospital Quality website, the Center for Hospital Quality annual conference and the quality improvement training program, known as Quality Improvement 101.
- Aligned rural hospital involvement in the statewide RACE collaborative to improve AMI care, in partnership with Duke University and the Kate B. Reynolds Charitable Trust.
**Pneumonia Composite Score**

**Time Period:** April 2008 through March 2009

- 95% Reliability
- NC Top 10%

**Pneumonia Trend Composite Aggregate**

- NC Top 10%
- 173% Improvement
- 26.4% in 2004
CAH Combined Indicator Scores
Time Period: April 2008 through March 2009

CAH Indicators

Audit Care Indicators

- HF Discharge 1m
- HF LVP Assess
- HF ACE1 / ANB
- HF Sib Cdia
- HF Composite
- PNE LVP Assess
- PNE ACE1 / ANB
- PNE Blood Cdia
- PNE Blood CXAB
- PNE IVVacc
- PNE IVCare
- PNE DSWG Assess
- PNE Composite
Rural Hospital Engagement Model for Performance Improvement

Tracking Small and Rural Hospital Participation in Performance Improvement Activities and Programs

- Core Measures
- HIT Strategic Plan
- Board Quality Curriculum
- Lean Culture Collaboration
- 340B Drug Program
- AHRQ Culture of Patient Safety Survey
- Healthcare Leadership Quality Assessment Tool (HLQAT)
- Hospital Consumer Assessment of Healthcare Providers & Systems (HCAHPS)

North Carolina Rural Health Center