LEAN Transformation Storyboard
2015 to present
Problem: Many staff do not have access to supply areas needed to complete their work, ex. float nurses, physicians, PCAs. Staff must seek out a nurse to gain access, taking time away from performing patient care and interrupts the flow of work for both parties. At the same time, we need to make sure stock is available when needed.

If we... change who has access to which rooms; change where supplies are kept; and change all locks to badge swipe terminals

Then we... will decrease interruptions in patient care; will reduce time spent away from providing patient care; and be able to better control access to supplies

Rapid Experiments:
- Rearrange IV start supplies, blood draw supplies, and medication IV fluids to consolidate number of locations required to perform tasks.
- Allow open access to Clean Utility room to all staff.
- Unlock IV room to simulate nursing and medical staff access.

Results of Changes (conservative estimates):

Change in location of supplies: Savings of 158 hours of productive staff time per year, per floor.

<table>
<thead>
<tr>
<th>From room 950 (furthest room)</th>
<th>Old Location</th>
<th>New Location</th>
<th>% Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance</td>
<td>111 yards</td>
<td>100 yards</td>
<td>10%</td>
</tr>
<tr>
<td>Time</td>
<td>124 seconds</td>
<td>98 seconds</td>
<td>26%</td>
</tr>
</tbody>
</table>

Change in access to supply rooms: Will eliminate 324 interruptions per day, per floor

<table>
<thead>
<tr>
<th>Room</th>
<th>Interruptions in 4 hour period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean Utility</td>
<td>25</td>
</tr>
<tr>
<td>IV Room</td>
<td>17</td>
</tr>
<tr>
<td>Pantry</td>
<td>12</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
</tr>
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</table>
Problem:

Errors are not resolved at the root cause.

Current State:

RIE #1: WHO should focus?
- ADMINISTRATORS and PRACTICE MANAGERS

RIE #2: WHERE should they focus?
- Begin with the most problem prone outpatient area

RIE #3: WHAT should be the focus?
- The ROOT CAUSE of the largest error, the largest gross charges

RIE #4: HOW do determine the ROOT CAUSE?
- An team of subject experts, researching and training ADMINISTRATORS and PRACTICE MANAGERS on the ROOT CAUSE solution

Experiments:
**Problem:** Currently, there is no system in place to secure and monitor/reconcile high ticket supplies/equipment in the operating room, resulting in monthly losses.

**Current State:** Easy access to supplies, boxes waiting to be unpacked.....

**Experiments:**

- **If we...** Create an OR Supply Staging/Receiving area
- **Then we...** Eliminate OR Hallway clutter
  - Establish a secure location for “uncrating” and reconciliation of supplies
- **If we...** Create satellite “PUT BACK CARTS” outside OR Suites
- **Then we...** Eliminate excess inventory in rooms
  - Avoid waste due to product expiration.
  - Eliminate over ordering of supplies
**Problem:** Patient room turnover can often be delayed, sometimes significantly, due to who is responsible for particular steps in the process. Further, notification of room status is not labeled appropriately in various systems, causing delays in room turnover and patients arriving in rooms without beds.

**Initial State**
- Significant delays in rooms being cleaned
- Room status inaccurate in tracking systems
- Rooms designated clean without beds
- No standard for disposal of IV fluids
- Access to Bedboard not universal
- Insufficient staff dedicated to meet floor demand

**Experiments**
- Inventory and manage beds: created bed corral of ready for patient beds
- Responsibilities for room turnover and a reliable bed tracking system: flag system

**Education and Access**
- Responsibilities for room turnover: proper disposal of IV fluids – who, when, and where
- Real-time trigger for patients leaving the room: when to provide discharge plan and when to discharge via visit maintenance
- Ensure access to systems and functional knowledge
**Problem:** Administration of medication in the Emergency Department is a vital part of patient care and treatment. In order to effectively treat ED patients in a timely manner, we must ensure adequate stocking of commonly used medications in the ED and eliminate wasteful steps in the workflow of retrieving missing medications from pharmacy.

**Gap Analysis**
- Rework – Sunrise Orders and Green Slips
- Medication Not ON HAND When Needed
- Par Levels – Conceived not Calculated
- Clinical Staff Restocking
- Medication Usage Rates Unclear
- No Real Time Order Acknowledgement

**Experiments**
- Combined clinical insights, calculation, dosage and packaging to create new par levels
- Expanded exchange cart concepts through creation of new “infrequent medications” tackle box for medication room
- Created par tracking tools
- Restocking process for Trauma and Resuscitation Room medication carts

<table>
<thead>
<tr>
<th>True North</th>
<th>Metric</th>
<th>Baseline</th>
<th>Target</th>
<th>30 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Weekly number of medication units ordered via green paper order slip</td>
<td>96</td>
<td>48</td>
<td>54 (-44.1%)</td>
</tr>
<tr>
<td>T</td>
<td>Number of empty medication drawer sections divided by total number of medications in cart</td>
<td>23.4%</td>
<td>12.0%</td>
<td>19.0%</td>
</tr>
</tbody>
</table>
PROBLEM:
Currently, trays may arrive to the OR, incorrectly identified or missing required instrumentation. This delays cases, requires rework and is inconsistent with the goals of the Steering Committee regarding quality and room turn over time.

EXPERIMENTS:
• STANDARD WORK for Post Op tray Prep
• Unambiguous Time Frames for Pick Up and Return of Case Carts/Instruments
• Intercom between OR and Decon

WHAT DOES GOOD LOOK LIKE?
- Trust
- Team Work Between OR and CS
- Flow cells
- Standard Work
- 6S
- Minimal / Scheduled Interruptions
- “FOOL PROOF”
- Decreased Frustration
- Accurate
- Competent Staff
- NO RUSHING
- Improved Morale
- Communication
- Instrument Tracking System

Perceived Poor Quality = Reprocessing/Rework
Disorganized

NOT JUST INSTRUMENTAL....BUT WE DON’T CALL THEM SUPPLIERS

THIS FLOW AND STANDARDIZATION AT EVERY WORK STATION!
Problem: Currently there is no standard process for patient discharge. Often patients are informed of discharge during morning rounds but due to delays in writing of discharge order and discharge plan, patients don't leave until the evening. This coincides with peak ED admission times.

Initial State
• Disjointed flow
• Batched processes
• Delays between decision to discharge and patient leaving
• Patients leaving during peak admission times
• Low patient satisfaction

Gap Analysis
• Timeliness of lab results
• Lack of start time for rounds
• Interruptions during pre-rounds
• Redundant information through pre-rounding and rounding
• No set priority for tasks post-rounds
• Waiting to transport patients to tests
• Poor attendance at interdisciplinary rounds
• Radiological tests not being completed in a timely manner/difficulty getting tests scheduled

Experiments
• Identify and prioritize morning blood draws for patients with 24-hr discharge notices
• Computer On Wheels for medical team rounding
• Script for interdisciplinary rounds
• Standard work for start time of doctor rounds

Post-RIE Tasks
• Revise Interdisciplinary Rounds – purpose, participants, timing
• Set Radiology-Customer Expectations – no pull system in use, no standard work present
Problem: Currently, “Pick Sheets” are not consistently accurate. This results in wasting supplies and time. There is no standard work in place for review, modification or routine maintenance. This is inconsistent with the Peri Operative goals of efficient use of OR Time and Controlling Inventory Expenses.

Initial State: Pick Sheets are not accurate as a result of incorrect surgeon-specific preference cards. When they are updated, staff perceive that they not aware of the most “recent” pick sheet.

Rapid Experiments:
- Spontaneously updated preference cards during the case’ based on surgeon’s input, circulator’s insights regarding additional/un-used items. This was limited to THREE modifications, which were timed.
- STOPPED a work-around preference card selection during the booking process
- Timed experiment to test the feasibility of the service coordinator to be the point person to maintain and update preference cards
- Created an New Surgeon On Boarding Process which has not yet be “tested”

Summary of Changes:
- Created On-Boarding Process for New Surgeons
- Developed Standard Work for:
  - Spontaneous Modification of Pick Sheets
  - Choosing of Preference Cards when scheduling cases during booking process
  - Clean-up and Monthly Maintenance of Preference Cards by Service Coordinator
  - Established a naming convention for Preference Cards

<table>
<thead>
<tr>
<th>Metric</th>
<th>Initial State</th>
<th>Target State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Correct Pick Sheets</td>
<td>23%</td>
<td>50%</td>
</tr>
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</table>
Problem: Despite having a good system for delivering daily medications, there are still times RNs have to make medication requests. This causes delays in care and undue burden for the RNs. At the same time, a significant number of requested medications are returned to the Pharmacy on a daily basis. Filling and retrieving of unneeded medications delays order processing for needed medications.

Gap Analysis
• Daily medication delivery not coinciding with placing of orders from morning rounds
• Daily orders placed after 10am are not delivered until next day’s daily delivery due to no buffer
• Poor flow for filling orders in Pharmacy
• Insufficient quantity of pneumatic tube canisters in circulation
• Poor or no notification of delivery of medications
• Inaccurate information about, and expectations for, medication orders and requests

Experiments
• Adjusted delivery times for Med-Surg floors
• Reviewed stock medications and vitamins
• Created standard work for medication delivery and notification.
• Revised medication room delivery set-up
• Created education document for Nursing and Physicians
• Increased volume of tube canisters in circulation

Missing Medication Requests
⇒ Returned medications
⇒ Pharmacy staff rework
Problem: Standard work does not currently exist regarding decontamination work flow, this influences the time and the quality of tray and pack preparation; it is not defect free, which is inconsistent with the Value Stream Goals.

Initial State:
- Existing Standard Work not followed: OR to call for dirty cart pick-up and indicate Standard or Urgent
- Decontamination work flow and organization variable; Dirty and Clean areas merge; Frequent Starts and Stops
- Staff will regularly leave what they are doing, in order to “look for” carts that might be waiting in the OR hallway, which can delay the process
- Rework; Case Carts moved out, then moved up

SOLUTIONS AND EXPERIMENTS
If we... Create Flow
The we.. Reduce Error, Decrease Flow Time, Organize Work, Create Pull, Improve Staff Performance and Satisfaction and Meet customer expectation; DEFECT FREE
**Reason for Action:** The current layout of the Pharmacy Department does not match the needs of the department based on its current responsibilities, inhibiting flow and delaying service provision. A redesign is needed that will reduce motion and variability of motion, decreasing time to fill and deliver orders.

**Initial State and Gap Analysis**

**Crowded**
* Only 1.5 picking stations
* Cart filling and checking not spread out among shifts

**Empty Medication Bins**
* Par/bin size does not match demand
* No visual management

**Batching Missing Med and New Order Filling**
* Label filler not central to pharmacists

**Excessive Movement of Supplies and Equipment**
* Not co-located by unit
* Lack of space to store carts

**Experiments**
* Create multiple pick stations. Make stations specific to floors being picked for.
* Centralize pharmacists’ work areas.
* Create rolling cart for filled missing med requests/new orders.
* Create space for in-pharmacy cart storage
* Add shelving for slower moving meds removed from original pick station.
**Reason for Action:** The current system for scheduling radiological in-patient tests does not facilitate a pull system. This causes a delay in patients receiving required tests in a timely manner, doctors and nurses to spend significant amounts of time calling radiology departments to determine if patients can be sent for tests, and hinder patient satisfaction due to long waits and uncertainty as to their treatment.

**Gap Analysis**
- Priority given to ED patients, then out-patients, then in-patients
- Incorrect orders requiring technician intervention
- Runner Slip not showing complete information
- No checklist for pre-transport preparation by nurse
- No one responsible for determining priority of exams
- Limited operating hours
- No scheduled time for in-patient exams. All scheduling dedicated to out-patient.
- Decentralized electronic patient management systems
- No coordination with Transport Department

**Experiments**
- Schedule In-Patient Appointments in Ultrasound 2:00pm to 4:00pm
- Schedule In-Patient Routine Non-Contrast CT for 6:30am to 8am in ED CT Room
- Extend 2nd Floor CT Operating Hours 4:30pm to 8:00pm
- Create In-Patient MRI Exam Block for Monday AM and Thursday Afternoon
- Radiology Pre-Transport Checklist
- Create Resident education on ordering radiology exams at NUMC

**Further Recommendations**
- Extend MRI operating hours
- Study of transporter demand and takt time
- Study mode of transport to Radiology for various type of patients
- Adjust MRI transporter scheduled hours
- Collect and analyze data on volume of in-patients scheduled and tests completed
- Better communication by Radiology leadership of daily staffing of Radiology technicians
Problem: The Circulator RN turnover time is not optimal. An optimized process is needed to improve efficiency, maximize cases per day and increase patient and staff satisfaction as desired by the Value Stream.

- "CHAOS"
- No designated roles assigned
- Duplication of check lists
- Ineffective communication
- Excessive motion

WHAT DOES GOOD LOOK LIKE?
- Patient “READY TO GO”
  - Reduced motion for Circulator RN
- Defect Free TIME UTILIZATION
- Case carts matches needs of case
  - Instruments, Medications, Supplies
- Improved use of Translator Services
- One person responsible for the completion of pre-admit paperwork

GAP ANALYSIS
- Circulator RN runs back and forth between ASU & OR to see if patient is ready
- ASU staff reviews patient charts on day of surgery instead of prior to
- Circulator RN may not have everything needed for that day’s case and has to search for additional items
- At times the phone for translator services doesn’t work or staff is unable to hear from it
- Outdated H&P, Anesthesia Consent, Surgeon Consent, Vendor Consent

SOLUTIONS / RAPID EXPERIMENTS

IF we.....
Have a Liaison between ASU, Circulator and OR Desk

THEN we.....
• Eliminate Silos
• Establish Communication Flow
• Eliminate MOTION Waste
• KNOW when patient and rooms are ready!

IF we.....
Utilize the available lead time

THEN we.....
• Decrease delays r/t incomplete charts
• Identify patients requiring translation
• Identify “day of” labs
Reason for Action: Although there is a small phlebotomy team in the hospital, there is no standard work for completion. When there is a call out or vacancy, some units are done, and others are not. This haphazard procedure for phlebotomy results in late reporting of critical values, which results in late discharging of patients or a delay in treatment.

CURRENT STATE:
- Average Percent of 'Give Backs' in 5 month period – 6%
- Number of Patients to be drawn - 100
  - 25 Patients per Phlebotomist
- Team leader time to collect and distribute assignments - 5 minutes
- Phlebotomist Prep time – 4 minutes
- Number of Steps in Process – 11
  - Value Added Steps - 8

DURING THE EXPERIMENT:
- Number of 'Give Backs' - 'V'
- Number of Patients to be drawn - 123
  - 21 Patients per phlebotomist
- Team leader time to collect and distribute assignments - 11 minutes
- Phlebotomist Prep time – 10 minutes
- Number of Steps in Process – 8
  - Value Added Steps - 5

IF WE....

THEN WE....

What does good look like?
- NO ‘Give backs’
- Floor Supervisor and Phlebotomy team leader are simultaneously aware of any ‘Give backs’
- Ability to scan patients and tubes to process blood draws, and collect data
- Staff scheduled according to volume
- Plan for TOMORROW, TODAY
- Ease of Assignments
- Readiness of Phlebotomists

Gaps Identified
- ‘Give backs’ disrupt RN workflow
- Lack of communication between areas if ‘Give backs’ were identified
- Use daily a.m. lab report to manually collect data
- NO process for absences
- NOT utilizing data collected
- Haphazard way of determining ‘Give backs’
- Preparation of carts prior to going to floors
- CENTRALIZED Phlebotomy staff

SOLUTION APPROACHES
- Have the phlebotomists start their assignments in one location
- Modify daily a.m. lab report to exclude in-patient discharges
- Match staffing with demand of patient draws on high volume days
- Increase productive hours, eliminate prep time and complete all draws (NO ‘Give Backs’)
- Change the phlebotomy team leader work flow and save time from searching through the report for discharges
- Change the phlebotomy team leader work flow and save time from searching through the report for discharges

RAPID EXPERIMENTS
- Created standard work to de-centralize team by changing location where work is assigned, implemented on the spot assistance from team leader and established collaborative team work
- By utilizing data collected we plan to implement staffing phlebotomists on high volume days
**Reason for Action:** The discharge of patients is often delayed due to prolonged waits for patient transportation to skilled nursing facilities or other medical facilities. These delays lead to patient and family dissatisfaction, along with delaying the timely movements of patients from the emergency Department and other units to those occupied beds. Better coordination and prioritization of patient discharges with in-house and outside ambulance services is needed.

**What does good look like?**
- Paperwork complete when EMS crew arrives
- Efficient paper process
- Advance notice of patient status change/delays/cancellations
- EMS staffed according to demand
- Ability to schedule transport at desired time
- Accommodate family requests for transport
- After hours notification of change
- Reduce late night transfers

**Gaps Identified**
- Communication
- Patient Ready
- Scheduling
- Ambulance availability
- Timely discharges

**SOLUTION APROACHES**

**IF WE....**
- Created a formal process to notify all stakeholders about P/U time
- Created a formal process to communicate patient status change
- Have timeframe guidelines for reasonable transfer

**THEN WE....**
- Would have a clear deadline established to complete paperwork
- Would decrease cancellation rate, have the ability to reallocate EMS resources, increase patient satisfaction
- Accommodate patient/family needs, increase patient satisfaction

**RAPID EXPERIMENTS**
- Sunrise—as a communication tool
- Email delivery process for Medical Necessity form
- Guideline for late discharges

**Changes**
- Centralizing transportation information
- Simultaneous disseminating patients status updates/delays/cancellations
- Electronic vs Paper/Telephone
- Adjusting EMS shifts to meet demands/peak period
- Guidelines regarding transports
Rapid Improvement Event  
Med-Surg  April 4-8, 2016  
Purposeful Rounding

Reason for Action: Our patient satisfaction scores indicate that the patients do not feel like they’re being cared for because the staff is not maximizing the time spent with patients.

What does good look like?
- Staff beginning their rounds immediately at the start of their shift
- Making sure the patient is comfortable and all their needs are met
- Talking with the patient... NOT rushing
- Listening to the patient
- Explaining what you’re doing for the patient
- Having the patient confirm their understanding
- Saying to the patient... “I’ll be back to check on you” .................and return!

Gaps Identified
- Task-focused staff; NOT patient focused
- Lack of re-enforcement of 4 P’s
- Lack of teamwork; silos
- Patients not knowing who their care providers are
- Staff not beginning their work on time

RAPID EXPERIMENTS
- Start purposeful hourly rounding immediately at the start of the shift.
- Alternate purposeful hourly rounding between RN & PCA
- Eliminate the existing “paper” monitoring

Changes
Reason for Action: Our patients report that their pain is not adequately well controlled and they don’t feel like the staff is doing everything to help control their pain.

<table>
<thead>
<tr>
<th>True North</th>
<th>Metric</th>
<th>Baseline</th>
<th>Percental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q</td>
<td>Pain well controlled</td>
<td>47%</td>
<td>1</td>
</tr>
<tr>
<td>T, Q, HD</td>
<td>Staff do everything to help with pain.</td>
<td>57.6</td>
<td>1</td>
</tr>
</tbody>
</table>

What does good look like?

- Having an organized approach to addressing pain management
- Anticipating the patient’s pain management
- Educating the staff regarding alternative measures
- Having anesthetics available on the unit at all times
- Having a “Pyxis” system
- Improving patients awareness and perception of pain management

Gaps Identified

- Pain relief expectations and options not communicated to patients
- Staff assuming the patient understands acceptable pain levels
- Absence of clear instructions
- Staff’s understanding of pain control
- Lack of re-enforcement of 4 P’s

Rapid Experiments

- Visual Management tools:
- Educate staff:
- Educate Patients
**Reason for action:** Our patient satisfaction scores indicate that the patients do not feel like they’re being cared for because the staff is not maximizing the time spent with them.

**Summary Changes**

- Developed standard work for the staff.
- Formed “buddy” systems to perform “total-care.”
- Designated specific times to complete certain daily tasks
LEAN at NuHealth

More great improvements to come!