

XXXXXXXXXXXXXXXX, XXXXXXX AZ

Vital Signs Time Study and CIT Nursing Unit Assessment Report

XXXXXXXXXX hospital in XXXXXX Arizona has implemented a new feature in their vital sign equipment to automatically record vitals data in the EMR. Prior to implementing the system, caregivers manually entered patient vitals into the EMR after taking them. The purpose of this time and motion study is to measure caregiver time taking and documenting vitals. This data will be used to estimate the amount of time saved in the caregiver's workday by implementing the automation of vitals documentation.

Baseline Study: A Time Study RN work sampling study and direct observation of vitals was performed on 9-12 April 2018 to determine the standard time for the Vitals tasks prior to implementing the new system. Time spent taking vitals and documenting vitals was observed by 4 data collectors who were assigned to caregivers (RN's and PCT's) on each unit. Vitals were performed in rounds in the early morning by RN's and in the early afternoon by PCT's.

Post Study: A Time Study RN work sampling study and direct observation of vitals was performed on 21-24 January 2019 to determine the standard time for the Vitals tasks after implementing the new system. Time spent taking vitals and documenting vitals was observed by 6 data collectors who were assigned to caregivers (RN's and PCT's) on each unit. Vitals were performed in rounds in the early morning and afternoon by PCT's and performed by RN's as needed throughout the day.

ABSTRACT

Vital Signs: The measured time to take vitals is 1.79 minutes, down from 2.42 minutes. After applying a 25% factor to account for additional work caused by the communication reliability with the EMR, the new Standard Time for Taking Vitals is 1.34 minutes. The detailed Vitals report can be found on page 3. An additional measurement is recommended to verify the new Vitals standard and validate the estimated savings once the improved support process is implemented.

5N: An Executive Abstract of the Unit Assessment can be found on page 6. RN utilization has improved and RN's are no longer considered over-utilized. However, RN's are still doing significant work that can be done by PCT's and adding PCT hours is recommended prior to the next measurement.

6th Floor: An Executive Abstract of the Unit Assessment can be found on page 20. RN utilization has improved and RN's are no longer considered over-utilized. However, RN's are still doing significant work that can be done by PCT's and adding PCT hours is recommended prior to the next measurement.

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Vitals Standard Time

The new vitals process does not include the transcribe or manual entry tasks, which were included in the Baseline standard. A summary of direct observation data is as follows:

Unit	Post		Baseline		Reduction (Min)	Reduction (%)
	Count	Take Vitals (Min)	Count	Take Vitals (Min)		
5N	158	1.87	118	2.62	0.75	29%
6N	90	1.66	109	2.21	0.56	25%
Combined	248	1.79	227	2.42	0.63	26%

The actual time measured for taking Vitals 1.79 minutes down from 2.42 minutes. This represents a 26% improvement in "time to take Vitals". This is validated by the TCAB assessment data which reported a 27% reduction in time RN's spent in Vitals.

Impact of Reliability Issues on the Results

During data collection, we experienced reliability issues with the communication between the vitals equipment and the EMR. These issues significantly affected the vitals processes that we observed. Based on the data, we observed the following:

1. 83% of Vitals events required additional time.
2. 71% of Vitals events required manual transcribing.
3. 59% of Vitals events required manual entry into the EMR.

This additional work caused caregivers to spend more time in the Vitals task and added additional time to the measurement. A comparison of the standard time between the baseline and post measurements indicates that the reliability issues may have caused caregivers to spend 25% more time on Vitals. This is in-line with my observations and therefore I am applying a 25% factor to the post measurement for the new Standard Time calculation.

New Standard Time

Unit	Count	Post		Baseline		Reduction (Min)	Reduction (%)
		Observed (Min)	Std (Min)	Count	Observed (Min)		
5N	158	1.87	1.40	118	2.62	1.22	47%
6N	90	1.66	1.24	109	2.21	0.97	44%
Combined	248	1.79	1.34	227	2.42	1.08	45%

The new Standard Time for taking Vitals 1.34 minutes down from 2.42 minutes. This represents a 45% improvement over the baseline in "time to take Vitals". This new standard should be validated with another TCAB Unit Assessment study after the new support process is implemented.

Actual Time Savings based on January Measurement

Time (Minutes) spent per day taking vitals by unit is as follows:

Unit	Max Census	PCT		RN		Total Reduction (Min)
		Count/ Pat Day	Reduction (Min)	Count/ Pat Day	Reduction (Min)	
5N	32	64	40	64	40	81
6N	48	96	60	96	60	121
Hosp	384	768	484	768	484	968
Hosp Annual	140,160	280,320	176,602	280,320	176,602	353,203

Annual hospital-wide time savings as measured:

	Hourly Rate (\$)	Reduction (hrs/yr)	Annual Savings (\$)
PCT	\$ 16.33	2,943	\$ 48,059.19
RN	\$ 36.18	2,943	\$ 106,477.74
Total			\$ 154,536.93

Estimated Time Savings based on the new Standard

Time (Minutes) spent per day taking vitals by unit is as follows:

Unit	Max Census	PCT		RN		Total Reduction (Min)
		Count/ Pat Day	Reduction (Min)	Count/ Pat Day	Reduction (Min)	
5N	32	64	69	64	69	138
6N	48	96	104	96	104	207
Hosp	384	768	829	768	829	1,659
Hosp Annual	140,160	280,320	302,746	280,320	302,746	605,491

Annual hospital-wide time savings as measured:

	Hourly Rate (\$)	Reduction (hrs/yr)	Annual Savings (\$)
PCT	\$ 16.33	5,046	\$ 82,397.26
RN	\$ 36.18	5,046	\$ 182,555.60
Total			\$ 264,952.86

Notes:

1. All data, calculations, and summaries for this report can be accessed in the Excel file included with this document.
2. Cost data reference
http://www.natho.org/pdfs/KPMG_2011_Nursing_LaborCostStudy.pdf

5N CIT Nursing Unit Assessment Report
Post Implementation of Vitals Automation to EMR

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EXECUTIVE ABSTRACT OF RESULTS ON 5N:

Some variation with the NBD is expected because of varying patient acuities and conditions.

The first question we ask when evaluating this data... **“are RN’s doing work that can be done by PCT’s?”** Activities that are used as indicators include ADL’s (>30 min), Incontinence (>23 min), non-clinical Patient Services (>22 min), and Vital Signs (>18 min). Minutes reported are greater than the benchmark. Furthermore, RN’s reported that 17.7% of their work could be done by a “PCT” or “Other Worker”, which is 7.7% above normal.

The second question we ask... **“are RN’s spending enough time in key care-giving priorities?”** We use teaching as an indicator because the importance of teaching patients how to care for themselves after they leave the hospital has become an important priority for reducing readmission rates. Teaching on this unit is 1.20%, which is less than the national average and well below the 5% target for Care, Innovation, and Transformation (CIT) program units.

The third question we ask... **“Are nurses over-utilized?”** Over-utilization is a chronic problem in nursing today – even at the top hospitals. Over-utilization, is typically caused by a combination of process inefficiency and inadequate staffing. The effects of over-utilization include the following:

1. Nurses are not available when patients need them.
2. Important care-giving priorities such as teaching fall through the cracks.
3. Nurses put off work, such as rounding, vitals, and documentation, to respond to immediate patient needs that could be done by PCT’s.
4. The long delays entering data into the patient record result in transcription errors and omissions in the patient record.

Measures that indicate over-utilization include time spent in value added care (<1%), time spent in direct care (<1%). The NBD target for utilization on this unit is 85.7%, which is (<1%) of actual and very close to the top limit of the trigger.

In summary, we can conclude that RN’s are not over-utilized (<1%); however, they are doing a significant amount of work that could be done by PCT’s (>17%), which is taking them away from other priorities, such as teaching patients (>4%).

Vital Signs: We saw an overall 1% reduction in the time RN’s spend on vitals on the unit, which represents a 19% improvement in performance over the baseline. Because of the reliability issues we observed and the improvements in support implemented after the study I am convinced that the actual improvement will be significantly higher than we were able to measure.

Recommendation for next measurement: Add PCT hours to the unit which will allow RN’s to use the extra time to teach/instruct patients what they need to know to avoid readmission; and perform a follow-up data collection when the improved support process is fully implemented.

TIME STUDY RN UNIT ASSESSMENT FOR TCAB/CIT

Introduction

It all began with “Transforming Care at the Bedside”. The initiative was formed because of an observed trend that technology, new unit design, and new nursing processes were causing the nurse to spend less time at the bedside - impacting patient care, quality, and outcomes. At the same time, LEAN and Six Sigma success stories in manufacturing were catching the attention of healthcare organizations globally. Taking action, RWJ funded a pilot project at 3 hospitals to use emerging LEAN and Six Sigma methods to address the problem of reduced caregiver time at the bedside with the ultimate goal of improving patient care, quality, and outcomes.

In 2002, the RWJ/IHI/AONE team turned to Rapid Modeling Corporation to develop a methodology to measure caregiver time at the bedside and to support the broad range of continuous improvement opportunities in the nursing environment. Working with the nursing teams in the pilot phase of TCAB, Time Study RN was developed to measure how and where caregivers spend their time. Since 2002, Time Study RN has been used at over 600 hospitals throughout North America and has evolved through 10 new software releases.

Time Study RN has become the standard tool of choice for pre-implementation and post-implementation studies for new technology and changes to nursing practice and policy on caregiver workload.

All benchmarks in this report are calculated using the average value from the 24 “Neuro” units in the Time Study RN National Benchmarking Database. A description of the National Benchmarking Database is included in Appendix A.

Time Study RN Work Sampling Methodology

The TCAB PDA methodology is based on work sampling. Work Sampling is broadly defined as the application of statistical sampling techniques to the study of work activities. Work sampling is typically used to estimate the proportion of worker’s time that is devoted to different elements of work activity. Work sampling is valid when observations to be made are selected randomly and the observations themselves must be free of bias.

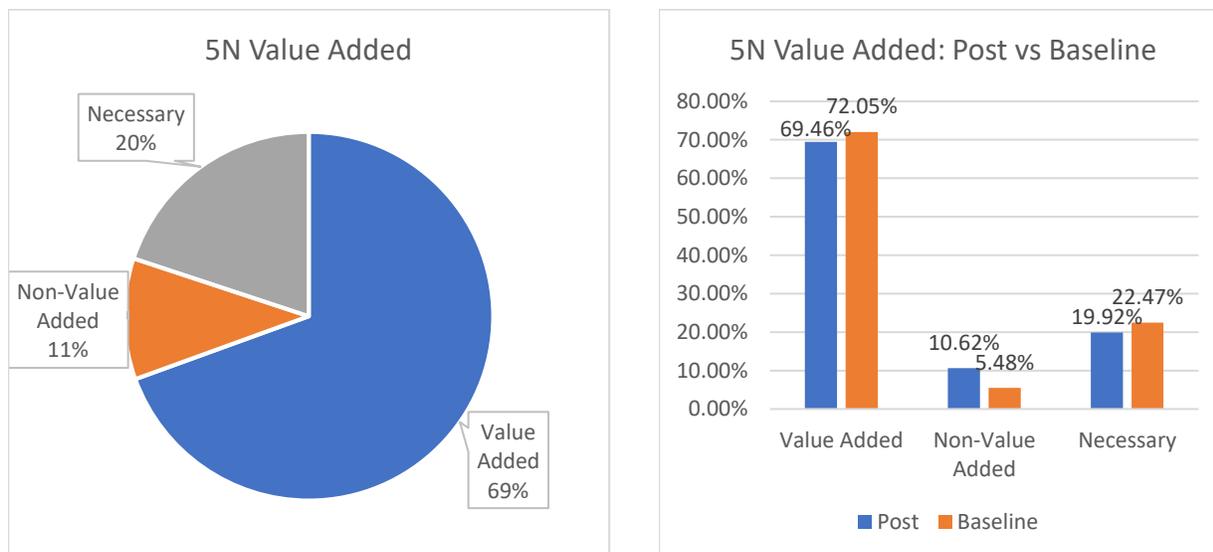
The PDA devices in the study automatically randomize alarms, and observations are made using a technique called self-sampling. Since nurse activity is complex with significant multi-tasking, it is not always possible for an observer to accurately classify the work that is being performed. Self sampling is a method in which the Nurse enters the data directly into the data collection device, ensuring that the most accurate work category is selected. Some of the primary advantages of work sampling are as follows:

1. Work Sampling is less expensive than continuous observation techniques.
2. Self Sampling is possible with minimal specialized training.
3. The number of observations can be adjusted to meet desired levels of precision.
4. Work/Self Sampling results in less anxiety and agitation among workers than continuous observation.
5. There is minimal interference with the worker’s normal routine.

5N Value Added Care Assessment

The definition of Value Added Care we use within the National Benchmarking Database is defined as care that patients/payors are willing to pay for. Within the clinical domain, the many professionals who have guided this work over 15 years have established that Value Added Care is any activity that contributes to the care and health of patients and equipping families (e.g. home caregivers) to properly care for the patient once they leave the healthcare environment. Value Added Care is broken down into Direct Care and In-Direct Care.

Necessary is a category of Non-Value Added work that was created to account for activities that are either required or where there was not consensus on their value added status.



5N Value Add Data Summary:

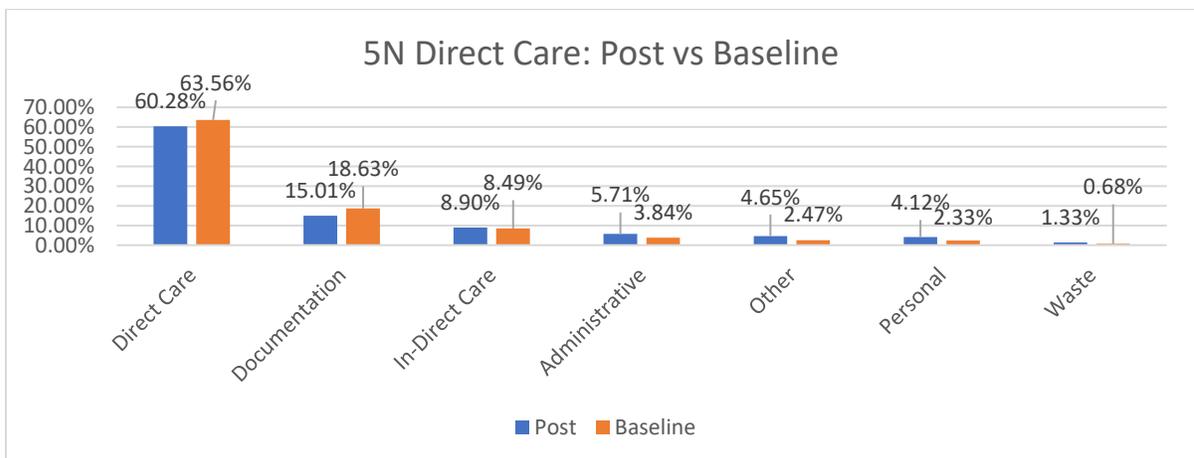
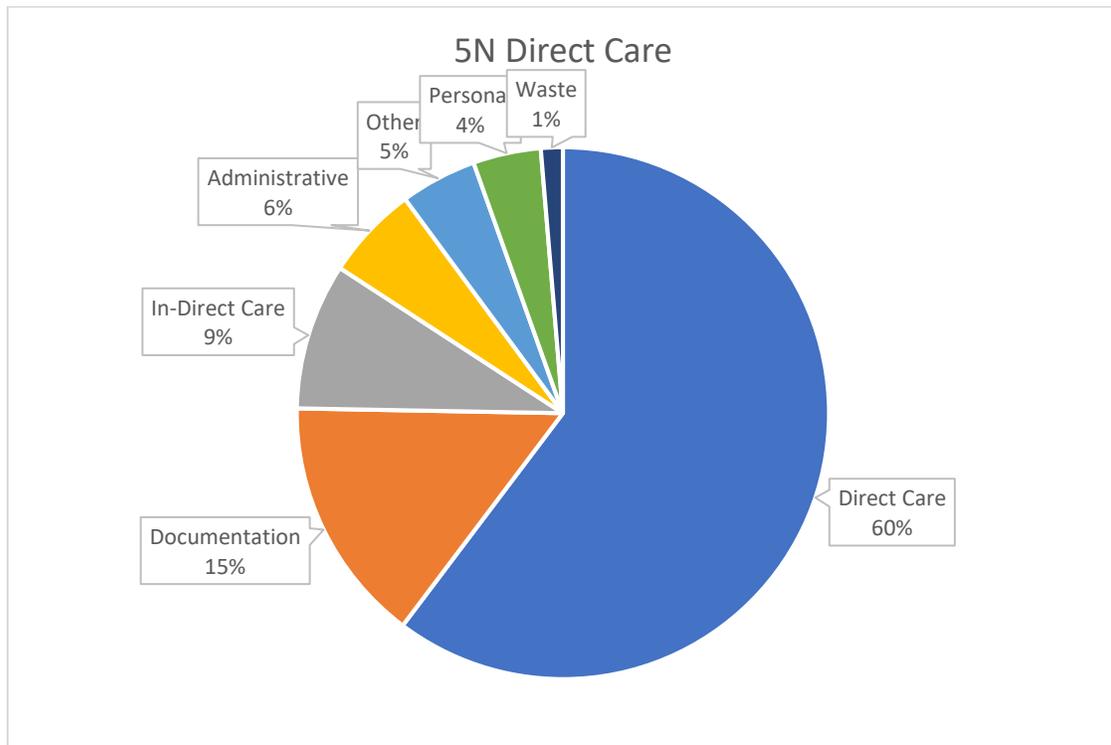
	Post	Baseline	Difference
Value Added	69.46%	72.05%	-2.99%
Non-Value Added	10.63%	5.48%	-5.14%
Necessary	19.92%	22.47%	2.15%

5N Value Add Discussion:

Nurses on 5N are spending 4.6% more time in Value Added Care than the average unit (64.86%) in the National Benchmarking Database. Nurses are also spending 4.6% less time in Non-Value Added and Necessary time than the average unit in the National Benchmarking Database. Nurses on 5N are in the top quartile for time spent in Value Added Care.

5N Direct Care Assessment

Direct Care is defined as the clinical work of caring for patients and is considered 100% value added. Indirect Care is defined as the non-clinical work of caring for patients and is still considered 100% Value Added.

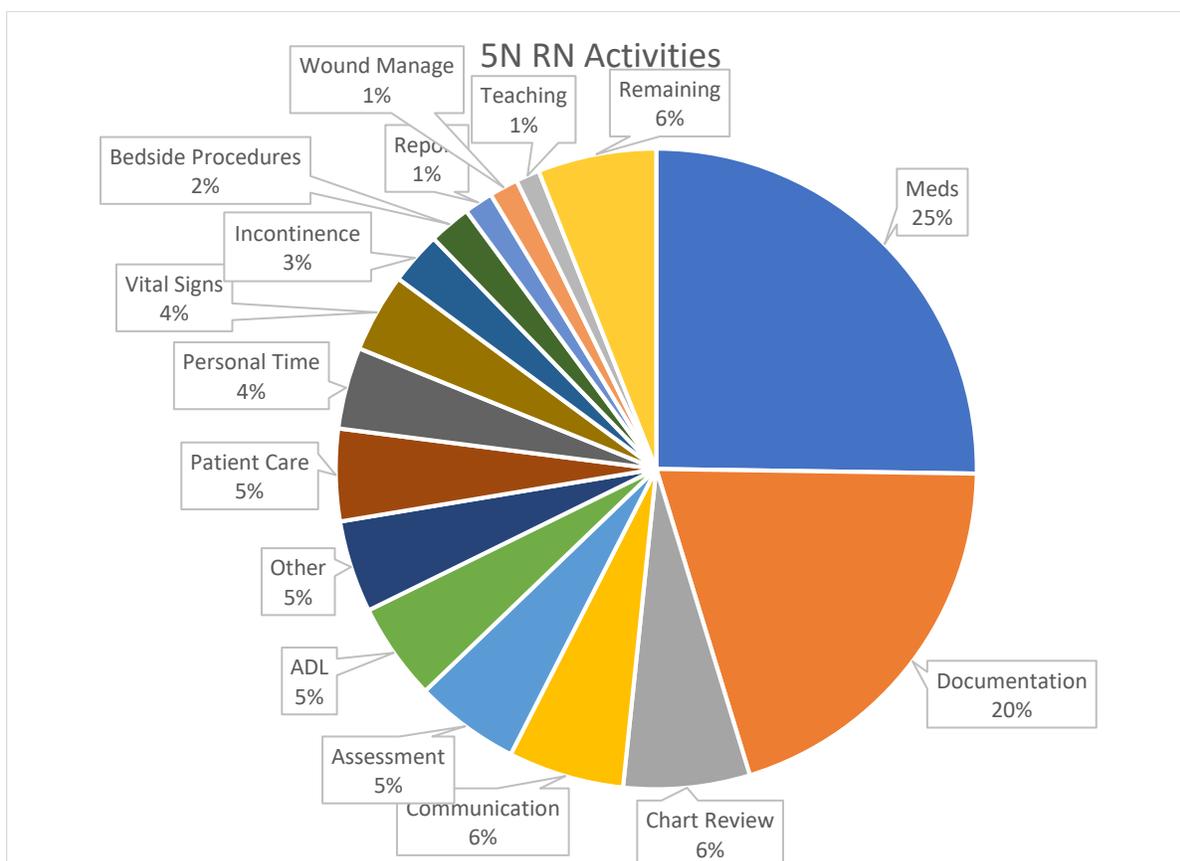


Note: Nurses on 5N are in the top quartile for time spent in Direct Care. 5N is 0.03 Nurse hours per Patient day above the target, which is great. The goal is to be as close to the target without going over.

5N Direct Care Data Summary:

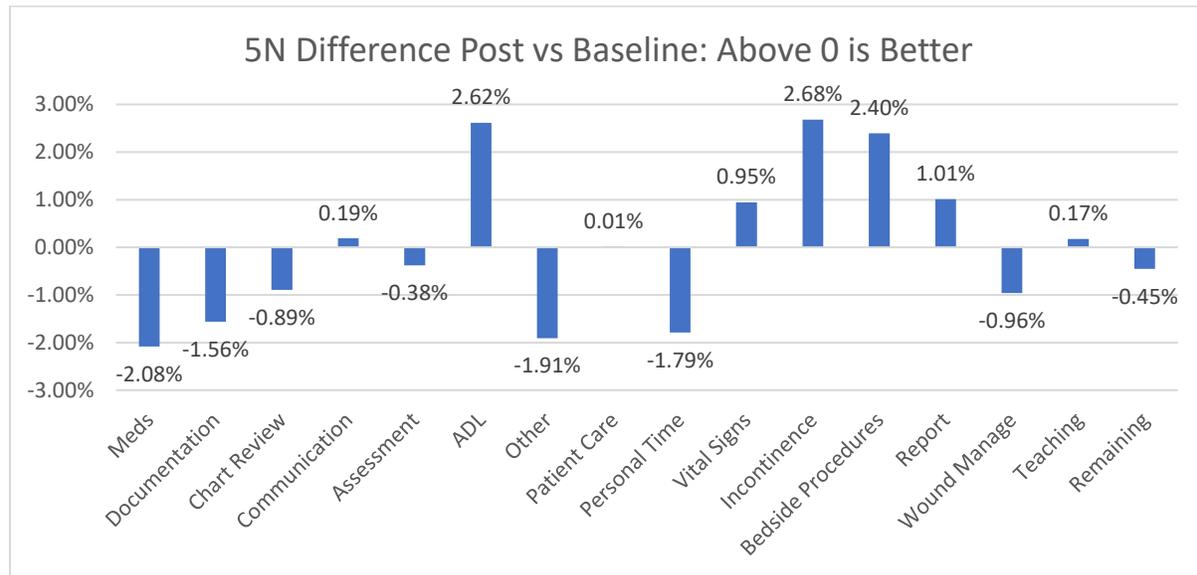
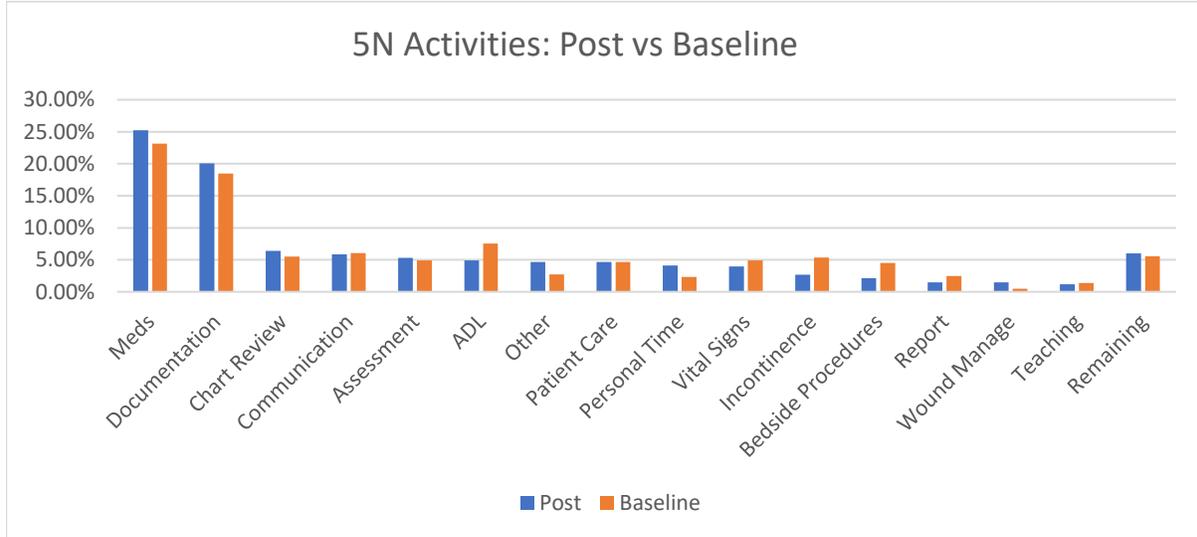
Category	Post	Baseline	Difference
Direct Care	60.28%	63.56%	-3.28%
Documentation	15.01%	18.63%	3.62%
In-Direct Care	8.90%	8.49%	0.41%
Administrative	5.71%	3.84%	-1.87%
Other	4.65%	2.47%	-2.18%
Personal	4.12%	2.33%	-1.79%
Waste	1.33%	0.68%	-0.65%

5N How Do Nurses Spend their Time?



Notes: The pie chart above is a summary of activities performed by RN’s on 5N during the study period. The purpose of this chart is to help us determine whether nurses are working at their licensure and whether nursing priorities are happening. An example of an important priority is “teaching patients how to care for themselves” after they leave the hospital. The target within the NBD community is 5%.

5N Post vs Baseline Activity Comparison

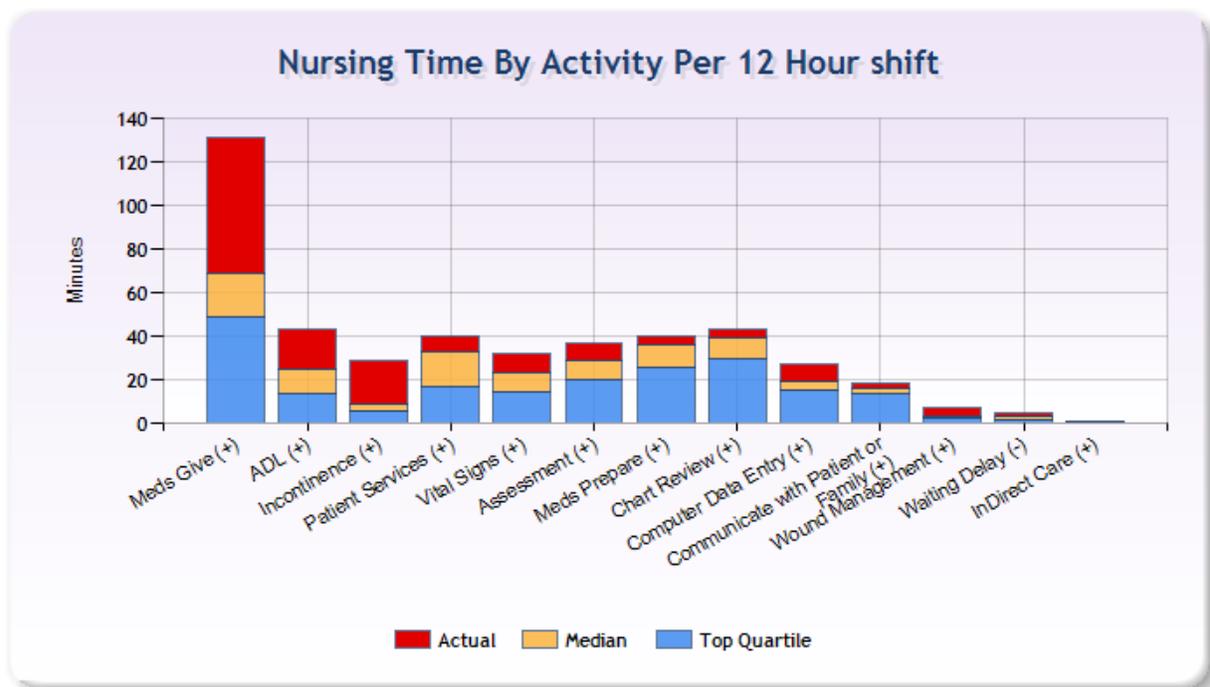


Note: Above the zero line indicates improving performance post compared to the baseline. However, changes in patient mix and acuity during the study periods are factors in the variation between measurements.

5N Unit Assessment Report

This report identifies areas of nursing practice that may be inefficient based on the time spent doing those tasks when compared to other similar units in the national benchmarking database. Where nursing teams spend more time than the national benchmarks, there can be process inefficiency causing care givers to spend more time doing those tasks.

This report lists the activities from left to right based on the highest margin between actual time and the time a top quartile hospital spends in that activity. The data table below shows the number of minutes that could be saved if the top quartile and median is achieved.



Top Quartile	82.7	30.2	23.6	22.9	18.1	16.8	14.5	13.0	12.2	4.7	4.2	3.0	0.2	246.0
Median	63.1	18.9	19.7	7.3	9.3	8.2	4.3	3.8	8.4	2.4	3.4	1.3	0.1	150.1

5N Activities Discussion:

Comparing Post to Baseline on Meds and Vitals measured a variation of 2% and 10% respectively, which validates the tool. 4 out of the top 5 activities in the chart can be performed by PCT’s. These include ADL’s, Incontinence, Non-Clinical Patient Services, and vital signs. This result is a trigger for a staffing model intervention which would include testing a scenario of added PCT hours.

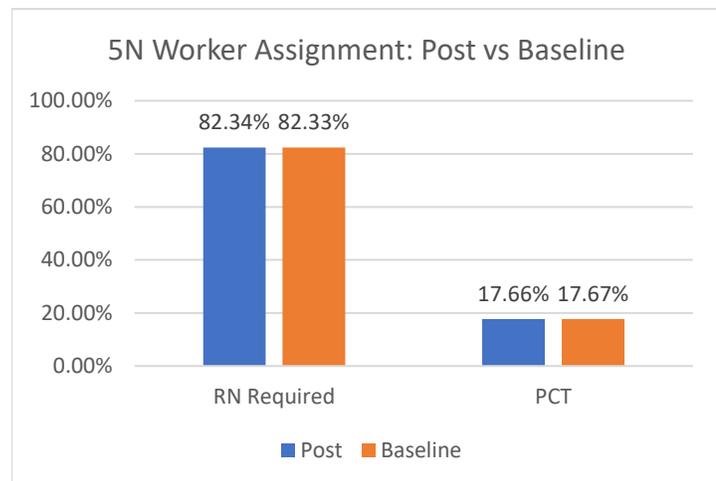
5N Activity Data Summary:

	Post	Baseline	Diff
Meds	25.23%	23.15%	-2.08%
Documentation	20.05%	18.49%	-1.56%
Chart Review	6.37%	5.48%	-0.89%
Communication	5.84%	6.03%	0.19%
Assessment	5.31%	4.93%	-0.38%
ADL	4.91%	7.53%	2.62%
Other	4.65%	2.74%	-1.91%
Patient Care	4.65%	4.66%	0.01%
Personal Time	4.12%	2.33%	-1.79%
Vital Signs	3.98%	4.93%	0.95%
Incontinence	2.66%	5.34%	2.68%
Bedside Procedures	2.12%	4.52%	2.40%
Report	1.46%	2.47%	1.01%
Wound Manage	1.46%	0.50%	-0.96%
Teaching	1.20%	1.37%	0.17%
13 Other Tasks	5.98%	5.5300%	-0.45%

5N Worker Assignment

Time Study RN asks the nurse if the task they are doing could be done by another resource. The purpose of the question is to assess the nurse’s satisfaction with their work content and evaluate the effectiveness of the staffing model.

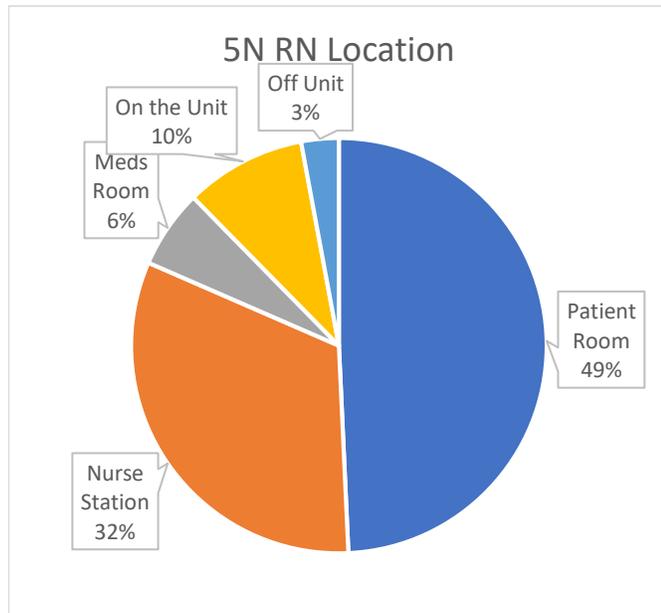
A typical hospital measures less than 12% of the nurses work content could be done by another resource. When this measurement is greater than 12% we recommend a TCAB event on the staffing model.



Nurses on 5N state they are doing work that can be done by other resources 17.7% of the time. This number is identical to the Baseline measurement and is a trigger for a staffing model intervention which would include testing a scenario of added PCT hours.

5N Where Do RN's Spend their Time?

Time Study RN asks the nurse to enter their functional location at the moment the PDA alarms. This information helps us to evaluate the amount of time they spend in each functional location. This is useful because it illustrates where nurses are doing their work. In process improvement, the goal is to move work closer to the point of care which is in or around the patient room.



5N Safe Staffing Targets

As we learned more about ANA's Registered Nurse Safe Staffing Act, it became evident that a new approach was needed in the performance improvement disciplines to support the objectives of safe staffing. To align performance improvement activity with the principles of safe staffing we have introduced the safe staffing targets for Value Added Care, Nurse Utilization, and Patient Hours per Nurse Day in the Time Study RN National Benchmarking Database. The safe staffing targets are calculated using algorithms from heuristics developed in the program and validated in a simulation model that associates staffing levels with safe care delivery.

The new safe staffing targets are calculated and unique for each unit and are included in the dashboard of the Time Study RN National Benchmarking Database. The purpose of the new targets are to ensure that performance improvement groups using the LEAN model treat nurse availability as a value added activity in healthcare practice, which supports the Registered Nurse Safe Staffing Act objectives.

	Value Add	Nurse Utilization	Patient Hours per Nurse Day	Nurse Hours per Patient Day
Target	70.77%	85.71%	10.29 hrs.	2.06 hrs.
Actual	69.45%	84.40%	10.13 hrs.	2.03 hrs.

The Nurses on 5N are measuring just below the target. This indicates that RN's are not over utilized. This score is about as good as you can get. Refer to the Discussion on this subject on page 6.

5N Unit Layout Analysis

This analysis will include the development of the functional priorities in the workspace using a density function. The density function is derived from the PDA's and it shows the strength of the location relationships based on the intensity of flow between them. This table is sequenced from highest to lowest or from most important to least important. This information helps us determine the priorities in designing units of this type and adds to the research on the impact of nursing unit design on nurse workload. The national benchmarking database currently has over 600 unique unit data sets.

PDA Density Function

Rank	Begin Trip	End Trip	Freq
1	Patient Room	Nurse Station	44.47%
2	Meds Room	Patient Room	19.10%
3	On the Unit	Patient Room	7.79%
4	Patient Room	Supply Storage	7.29%
5	Meds Room	Nurse Station	3.77%
6	Nurse Station	Off Unit	2.51%
7	On the Unit	Nurse Station	2.01%
8	Nurse Station	On the Unit	1.26%
9	Conf Room	Patient Room	1.01%
10	Equip Storage	Patient Room	1.01%
11	Patient Room	Document Server	1.01%
12	Staff Toilet	Nurse Station	1.01%
13	Conf Room	Nurse Station	0.75%
14	Kitchen	Patient Room	0.75%
15	Nurse Station	Staff Toilet	0.75%
16	Patient Room	Off Unit	0.75%
17	Dirty Storage	Patient Room	0.50%
18	Kitchen	Nurse Station	0.50%
19	Nurse Station	Document Server	0.50%
20	Nurse Station	Supply Storage	0.50%
21	On the Unit	Supply Storage	0.50%
22	Patient Room	Staff Toilet	0.50%
23	Supply Storage	Meds Room	0.50%
24	Equip Storage	Nurse Station	0.25%
25	On the Unit	Meds Room	0.25%
26	On the Unit	Off Unit	0.25%
27	On the Unit	Staff Toilet	0.25%
28	Supply Storage	Nurse Station	0.25%

APPENDIX A: National Benchmarking Database Description

What is the National Benchmarking Database?

The National Benchmarking Database was created in 2007 in response to the demand from Transforming Care at the Bedside (TCAB) units for shared space to compile and compare their Time Study RN data (aka PDA data) with other facilities. The Benchmarking Database provides an average baseline for how nurses are spending time at or away from the bedside.

The database is anonymous, free, and has over 600 participating units contributing to the data. TCAB/Releasing Time to Care™ participants can use the database to inform their own improvement initiatives and to collaborate and learn from others in Saskatchewan, Canada, and the United States.

What is a TCAB Unit?

Transforming Care at the Bedside (TCAB) is an American program similar to Releasing Time to Care™ (RTC) that aims to improve patient experience, staff wellbeing, efficiency of care, and safety. Like RTC, the program works to help nursing staff spend more time at the bedside so they actively measure their direct care time, non-value added time, and value added time using the same PDAs we are using in Saskatchewan.

Why do we need this database?

The database assists nurses in answering questions about how to improve their work processes to spend more time at the bedside. It also helps examine procedures and policies that may impact the nursing workload. Ultimately, the goal of the database is to help put relevant and timely data into the hands of frontline staff, nursing managers, and leaders to inform their decision-making processes.

The database will also allow units to identify high performing units throughout North America to promote opportunities for collaboration and sharing. Communication with other units is facilitated through a private messaging system that allows users to maintain confidentiality and anonymity.

What does the National Benchmarking Database look like?

The user-friendly web portal allows participants to view their data as well as data from other participating units for learning purposes. Users can also create their templates for categorizing work and generate benchmarks based on those customized category definitions.

APPENDIX B: Safe Staffing Targets

The role of nurses in providing safe, quality care is globally understood by patients and caregivers alike. Despite this global understanding, the modern trend in healthcare administration is to squeeze as much cost as possible out of hospital operations and the number one target is nurse staffing. Nursing associations have responded by proposing “The Registered Nurse Safe Staffing Act” to ensure that the decision makers are providing and implementing adequate and safe nurse staffing plans.

As we learned more about ANA’s Registered Nurse Safe Staffing Act, it became evident that a new approach was needed in the performance improvement disciplines to support the objectives of safe staffing. In addition, 16 years of experience implementing TCAB at 100’s of hospital’s has shaped and informed our view on the definition of “value added care”. **We have determined that RN over-utilization impacts patient safety and that patients/ payors ARE willing to pay to have a nurse available when they need one.**

In an effort to align performance improvement activity with the principles of safe staffing we have introduced the safe staffing targets for Value Added Care, Nurse Utilization, and Patient Hours per Nurse Day in the Time Study RN National Benchmarking Database. The safe staffing targets are calculated using algorithms from heuristics developed in the program and validated in a simulation model that associates staffing levels with safe care delivery.

Dashboard				
	Value Add	Nurse Utilization	Patient hours per Nurse Day	Nurse Hours per Patient Day
Target	67.1%	82.61%	9.91	2.48
Last Measurement	69.12%	83.96%	10.08	2.15
Avg Measurement	69.12%	83.96%	10.08	2.13

The new safe staffing targets are calculated and unique for each unit and are included in the dashboard of the Time Study RN National Benchmarking Database. The purpose of the new targets are to ensure that performance improvement groups using the LEAN model treat nurse availability as a value added activity in healthcare practice, which supports the Registered Nurse Safe Staffing Act objectives.

Safe Staffing Summary

The new safe staffing targets provide the Staffing Committee at each hospital with new insight on determining and monitoring the staffing plan for each nursing unit and comparing “Patient Hours per Nurse Day”, “Nurse Utilization”, and “Value-Added Care” with the 600 other hospital unit datasets in the Time Study RN National Benchmarking Database.

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6N CIT Nursing Unit Assessment Report

Post Implementation of Vitals Automation to EMR

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The second question we ask... **“Are RN’s spending enough time in key care-giving priorities?”** We use teaching as an indicator because the importance of teaching patients how to care for themselves after they leave the hospital has become an important priority for reducing readmission rates. Teaching on this unit is 1.44%, which is less than the national average and well below the 5% target for Care, Innovation, and Transformation (CIT) program units.

The third question we ask... **“Are nurses over-utilized?”** Over-utilization is a chronic problem in nursing today – even at the top hospitals. Over-utilization, is typically caused by a combination of process inefficiency and inadequate staffing. The effects of over-utilization include the following:

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2. Important care-giving priorities such as teaching fall through the cracks.
3. Nurses put off work, such as rounding, vitals, and documentation, to respond to immediate patient needs that could be done by PCT’s.
4. The long delays entering data into the patient record result in transcription errors and omissions in the patient record.

Measures that indicate over-utilization include time spent in value added care (<3%), time spent in direct care (<2%). The NBD target for utilization on this unit is 85.7%, which is (<3%) of actual.

In summary, we can conclude that RN’s are not over-utilized (<3%); however, they are doing a significant amount of work that could be done by PCT’s (>17%), which is taking them away from other priorities, such as teaching patients (>4).

Vital Signs: We saw an overall 1.78% reduction in the time RN’s spend on vitals on the unit, which represents a 35% improvement over the baseline (3.42% vs 5.2%). I expect that to be much higher once the new support processes are implemented, which should significantly increase the reliability of the system.

Recommendation for next measurement: Add PCT hours to the unit which will allow RN’s to use the extra time to teach/instruct patients what they need to know to avoid readmission; and perform a follow-up data collection when the improved support process is fully implemented.

TIME STUDY RN UNIT ASSESSMENT FOR TCAB/CIT

Introduction

It all began with “Transforming Care at the Bedside”. The initiative was formed because of an observed trend that technology, new unit design, and new nursing processes were causing the nurse to spend less time at the bedside - impacting patient care, quality, and outcomes. At the same time, LEAN and Six Sigma success stories in manufacturing were catching the attention of healthcare organizations globally. Taking action, RWJ funded a pilot project at 3 hospitals to use emerging LEAN and Six Sigma methods to address the problem of reduced caregiver time at the bedside with the ultimate goal of improving patient care, quality, and outcomes.

In 2002, the RWJ/IHI/AONE team turned to Rapid Modeling Corporation to develop a methodology to measure caregiver time at the bedside and to support the broad range of continuous improvement opportunities in the nursing environment. Working with the nursing teams in the pilot phase of TCAB, Time Study RN was developed to measure how and where caregivers spend their time. Since 2002, Time Study RN has been used at over 600 hospitals throughout North America and has evolved through 10 new software releases.

Time Study RN has become the standard tool of choice for pre-implementation and post-implementation studies for new technology and changes to nursing practice and policy on caregiver workload.

All benchmarks in this report are calculated using the average value from the 24 “Neuro” units in the Time Study RN National Benchmarking Database. A description of the National Benchmarking Database is included in Appendix A.

Time Study RN Work Sampling Methodology

The TCAB PDA methodology is based on work sampling. Work Sampling is broadly defined as the application of statistical sampling techniques to the study of work activities. Work sampling is typically used to estimate the proportion of worker’s time that is devoted to different elements of work activity. Work sampling is valid when observations to be made are selected randomly and the observations themselves must be free of bias.

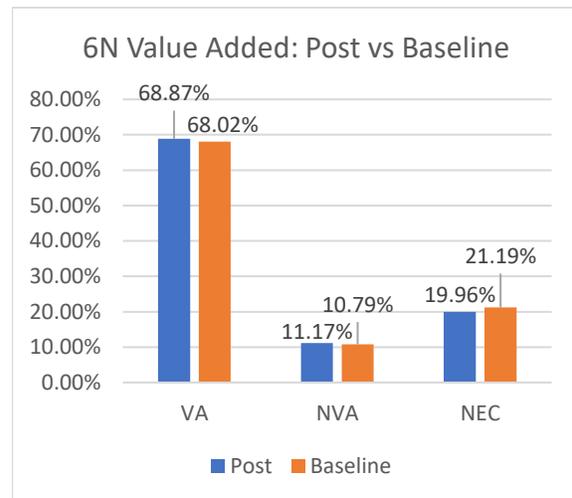
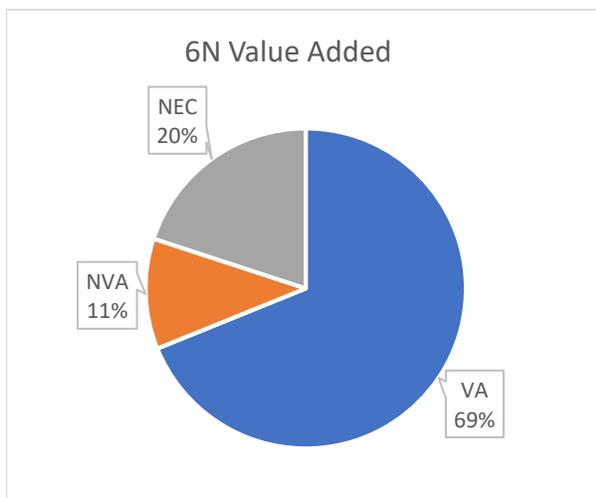
The PDA devices in the study automatically randomize alarms, and observations are made using a technique called self-sampling. Since nurse activity is complex with significant multi-tasking, it is not always possible for an observer to accurately classify the work that is being performed. Self sampling is a method in which the Nurse enters the data directly into the data collection device, ensuring that the most accurate work category is selected. Some of the primary advantages of work sampling are as follows:

1. Work Sampling is less expensive than continuous observation techniques.
2. Self Sampling is possible with minimal specialized training.
3. The number of observations can be adjusted to meet desired levels of precision.
4. Work/Self Sampling results in less anxiety and agitation among workers than continuous observation.
5. There is minimal interference with the worker’s normal routine.

6N Value-Added Care Assessment

The definition of Value Added Care we use within the National Benchmarking Database is defined as care that patients/payors are willing to pay for. Within the clinical domain, the many professionals who have guided this work over 15 years have established that Value Added Care is any activity that contributes to the care and health of patients and equipping families (e.g. home caregivers) to properly care for the patient once they leave the healthcare environment. Value Added Care is broken down into Direct Care and In-Direct Care.

Necessary is a category of Non-Value Added work that was created to account for activities that are either required or where there was not consensus on their value added status.



Value Add Data Summary:

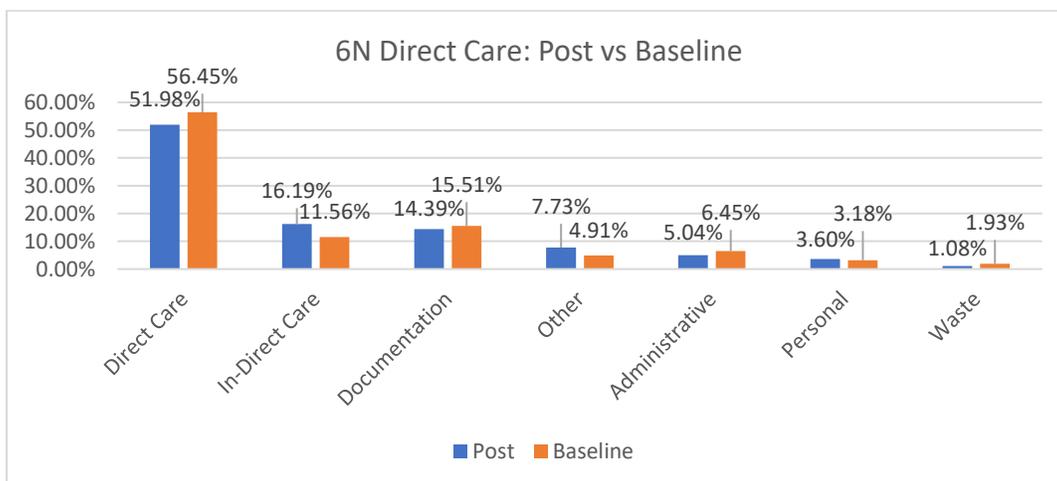
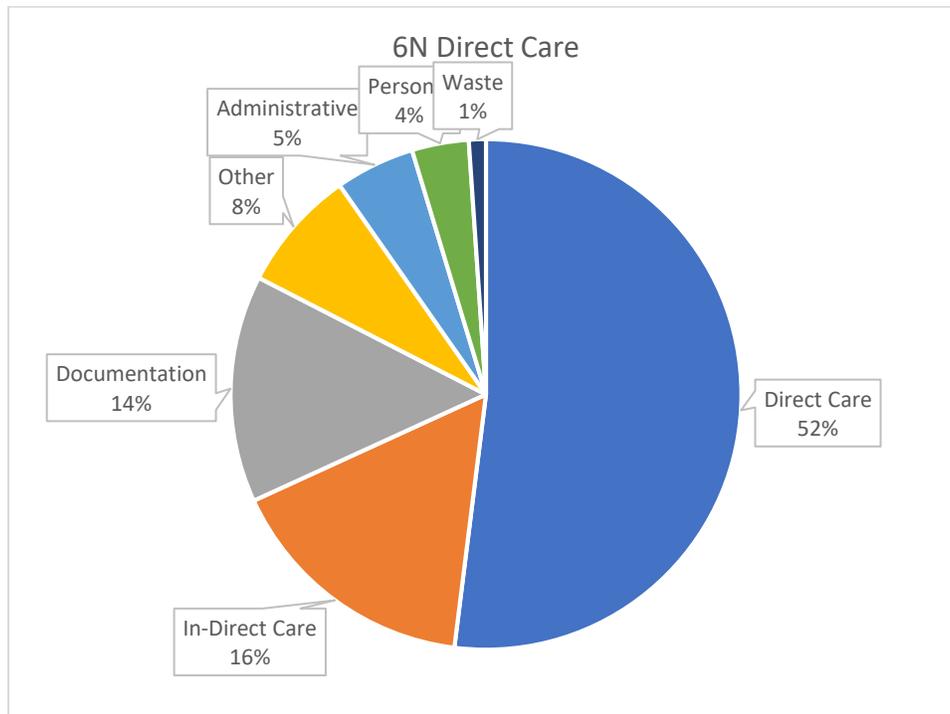
	Post	Baseline	Difference
Value Added	68.87%	68.02%	0.85%
Non-Value Added	11.17%	10.79%	-0.38%
Necessary	19.96%	21.19%	1.23%

Value Add Discussion:

Nurses on 6N are spending 3.93% more time in Value Added Care than the average unit (64.94%) in the National Benchmarking Database. Nurses are also spending 3.93% less time in Non-Value Added and Necessary time than the average unit in the National Benchmarking Database. Nurses on 6N are in the top quartile for time spent in Value Added Care.

6N Direct Care Assessment

Direct Care is defined as the clinical work of caring for patients and is considered 100% value added. Indirect Care is defined as the non-clinical work of caring for patients and is still considered 100% Value Added.

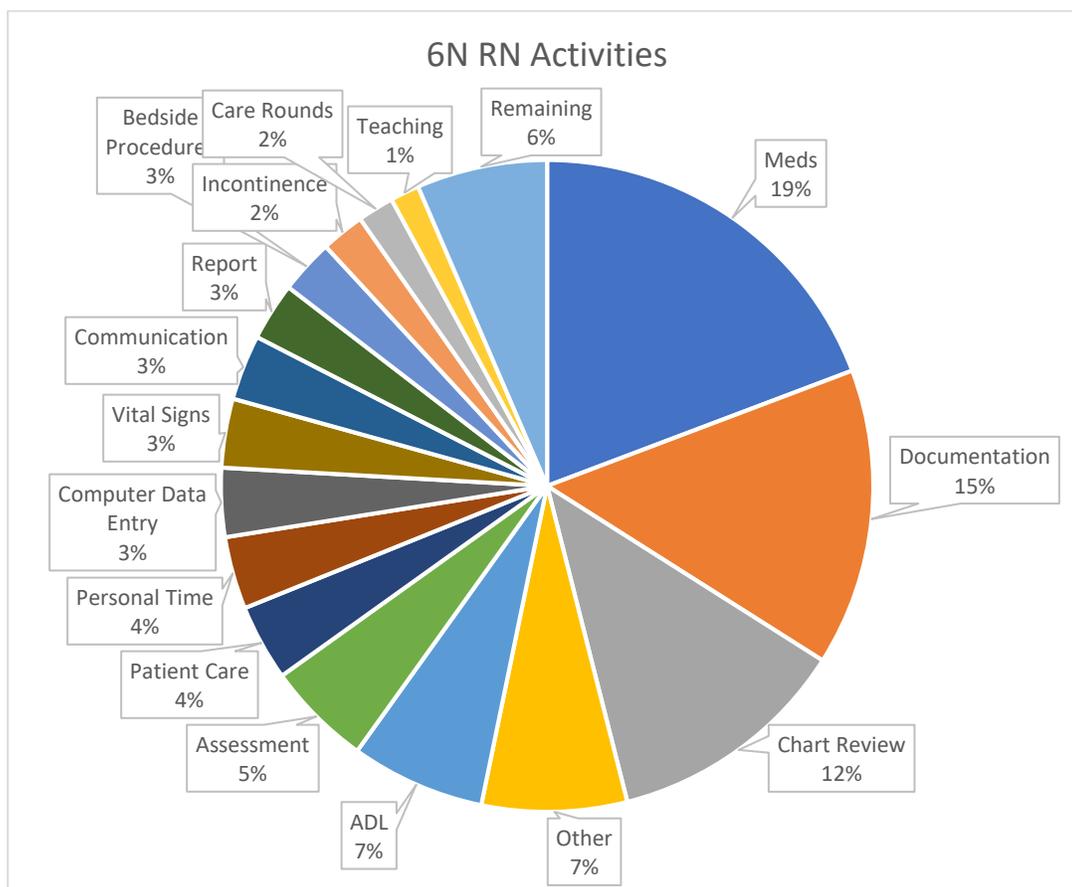


Note: Nurses on 6N spent 4.5% less time in direct care and 4.6% more time in Indirect Care in the Post study compared to the Baseline. 3.3% of this time was caused by more time spent in "Chart Review", which might be significant.

6N Direct Care Data Summary:

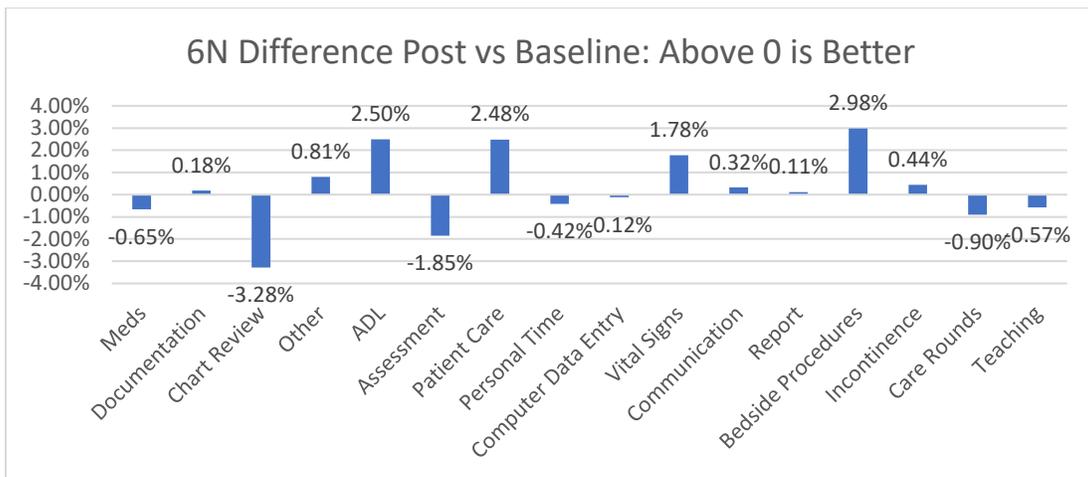
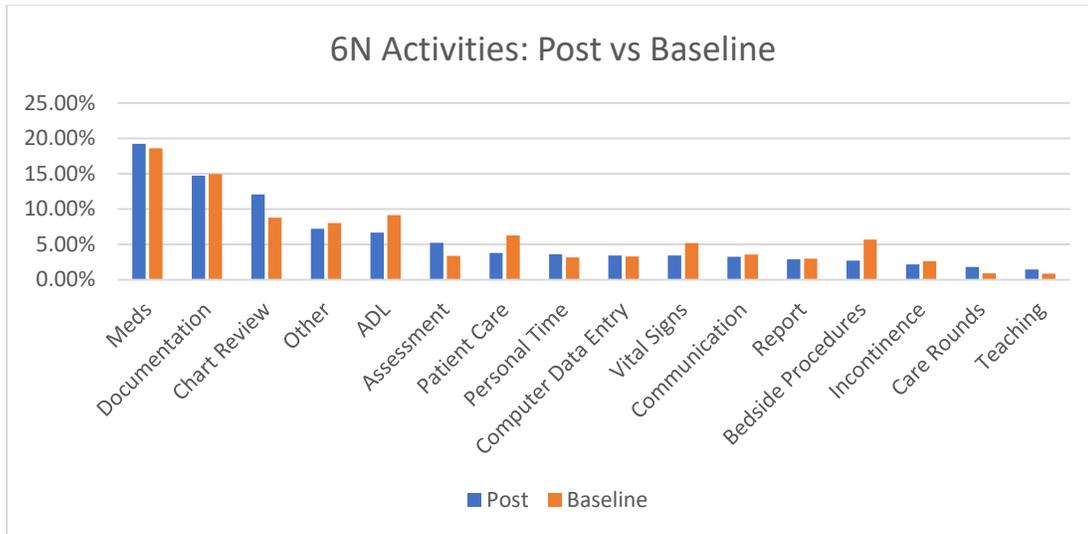
	Post	Baseline	Difference
Direct Care	51.98%	56.45%	-4.47%
In-Direct Care	16.19%	11.56%	4.63%
Documentation	14.39%	15.51%	1.12%
Administrative	7.73%	4.91%	-2.82%
Other	5.04%	6.45%	1.41%
Personal	3.60%	3.18%	-0.42%
Waste	1.08%	1.93%	0.85%

6N How Do Nurses Spend their Time?



Notes: The pie chart above is a summary of activities performed by RN's on 6N during the study period. The purpose of this chart is to help us determine whether nurses are working at their licensure and whether nursing priorities are happening. An example of an important priority is "teaching patients how to care for themselves" after they leave the hospital. The target within the NBD community is 5%.

6N Post vs Baseline Activity Comparison

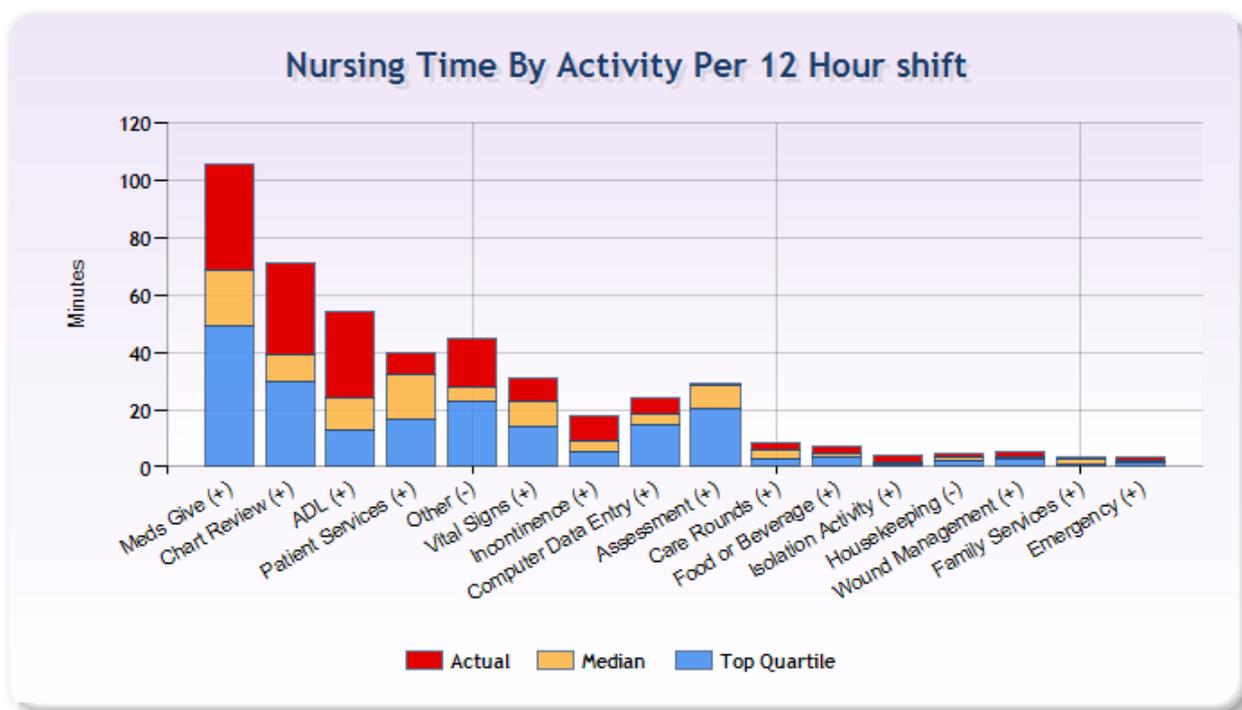


Note: Above the zero line indicates improving performance post compared to the baseline. However, changes in patient mix and acuity during the study periods are factors in the variation between measurements.

6N Unit Assessment Report

This report identifies areas of nursing practice that may be inefficient based on the time spent doing those tasks when compared to other similar units in the national benchmarking database. Where nursing teams spend more time than the national benchmarks, there can be process inefficiency causing care givers to spend more time doing those tasks.

This report lists the activities from left to right based on the highest margin between actual time and the time a top quartile hospital spends in that activity. The data table below shows the number of minutes that could be saved if the top quartile and median is achieved.



Top Quartile	56.7	41.6	41.1	22.8	21.8	17.2	12.6	8.9	8.8	5.7	3.7	3.2	2.9	2.8	2.0	1.8
Median	37.2	32.5	29.8	7.2	16.9	8.4	8.7	5.2	0.2	2.9	2.5	2.3	1.5	2.0	0.4	1.1

6N Activities Discussion:

Comparing Post to Baseline on Meds and Vitals measured a variation of 2% and 17% respectively, which validates the tool. 5 out of the top 7 activities in the chart can be performed by PCT's. These include ADL's, Incontinence, Non-Clinical Patient Services, vital signs, and other non-clinical work. This result is a trigger for a staffing model intervention which would include testing a scenario of added PCT hours.

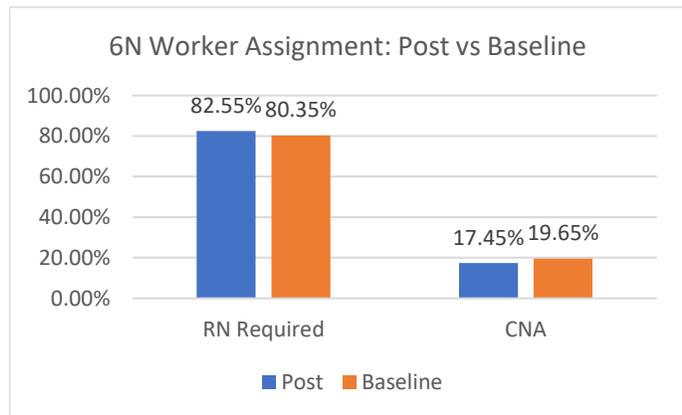
6N Activity Data Summary:

	Post	Baseline	Difference
Meds	19.24%	18.59%	-0.65%
Documentation	14.75%	14.93%	0.18%
Chart Review	12.05%	8.77%	-3.28%
Other	7.19%	8.00%	0.81%
ADL	6.65%	9.15%	2.50%
Assessment	5.22%	3.37%	-1.85%
Patient Care	3.78%	6.26%	2.48%
Personal Time	3.60%	3.18%	-0.42%
Computer Data Entry	3.42%	3.30%	-0.12%
Vital Signs	3.42%	5.20%	1.78%
Communication	3.24%	3.56%	0.32%
Report	2.88%	2.99%	0.11%
Bedside Procedures	2.70%	5.68%	2.98%
Incontinence	2.16%	2.60%	0.44%
Care Rounds	1.80%	0.90%	-0.90%
Teaching	1.44%	0.87%	-0.57%

6N Worker Assignment

Time Study RN asks the nurse if the task they are doing could be done by another resource. The purpose of the question is to assess the nurse’s satisfaction with their work content and evaluate the effectiveness of the staffing model.

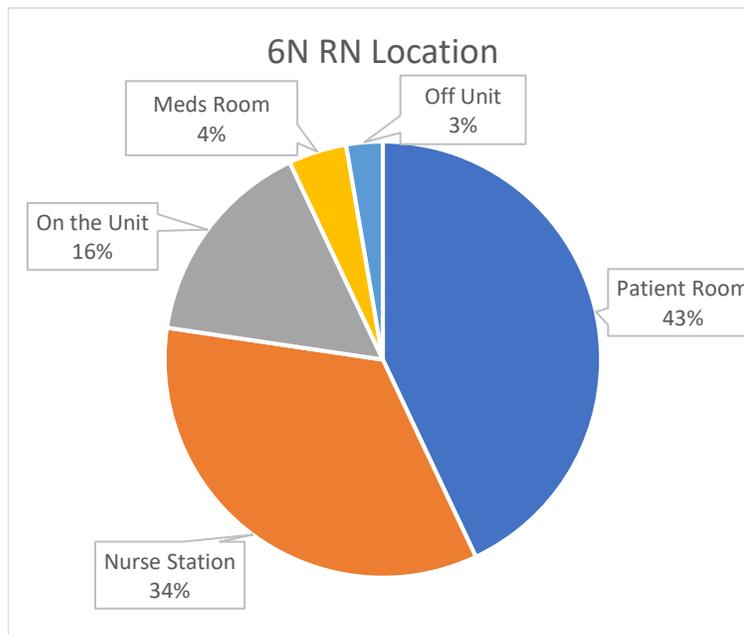
A typical hospital measures less than 12% of the nurses work content could be done by another resource. When this measurement is greater than 12% we recommend a TCAB event on the staffing model.



Nurses on 6N state they are doing work that can be done by other resources 17.5% of the time. This is a 2% reduction over the Baseline but still a trigger for a staffing model intervention which would include testing a scenario of added PCT hours.

6N Where Do RN's Spend their Time?

Time Study RN asks the nurse to enter their functional location at the moment the PDA alarms. This information helps us to evaluate the amount of time they spend in each functional location. This is useful because it illustrates where nurses are doing their work. In process improvement, the goal is to move work closer to the point of care which is in or around the patient room.



6N Safe Staffing Targets

As we learned more about ANA's Registered Nurse Safe Staffing Act, it became evident that a new approach was needed in the performance improvement disciplines to support the objectives of safe staffing. To align performance improvement activity with the principles of safe staffing we have introduced the safe staffing targets for Value Added Care, Nurse Utilization, and Patient Hours per Nurse Day in the Time Study RN National Benchmarking Database. The safe staffing targets are calculated using algorithms from heuristics developed in the program and validated in a simulation model that associates staffing levels with safe care delivery.

The new safe staffing targets are calculated and unique for each unit and are included in the dashboard of the Time Study RN National Benchmarking Database. The purpose of the new targets are to ensure that performance improvement groups using the LEAN model treat nurse availability as a value added activity in healthcare practice, which supports the Registered Nurse Safe Staffing Act objectives.

	Value Add	Nurse Utilization	Patient Hours per Nurse Day	Nurse Hours per Patient Day
Target	71.85%	85.71%	10.29 hrs.	2.06 hrs.
Actual	68.46%	82.33%	9.88 hrs.	1.98 hrs.

The Nurses on 6N are measuring below the target. This indicates that RN's are not over utilized. Refer to the Discussion on this subject on page 20.

6N Unit Layout Analysis

This analysis will include the development of the functional priorities in the workspace using a density function. The density function is derived from the PDA's and it shows the strength of the location relationships based on the intensity of flow between them. This table is sequenced from highest to lowest or from most important to least important. This information helps us determine the priorities in designing units of this type and adds to the research on the impact of nursing unit design on nurse workload. The national benchmarking database currently has over 600 unique unit data sets.

PDA Density Function

Rank	Begin Trip	End Trip	Freq
1	Nurse Station	Patient Room	34.43%
2	Meds Room	Patient Room	13.68%
3	On the Unit	Patient Room	10.85%
4	Nurse Station	On the Unit	6.60%
5	Patient Room	Supply Storage	5.19%
6	Document Server	Patient Room	4.72%
7	Meds Room	Nurse Station	3.77%
8	Nurse Station	Off Unit	3.77%
9	Off Unit	Patient Room	1.89%
10	On the Unit	Off Unit	1.89%
11	Conf Room	Nurse Station	1.42%
12	Document Server	Nurse Station	1.42%
13	Document Server	On the Unit	1.42%
14	Kitchen	Nurse Station	1.42%
15	Dirty Storage	Patient Room	0.94%
16	Patient Room	Conf Room	0.94%
17	Conf Room	On the Unit	0.47%
18	Dirty Storage	Document Server	0.47%
19	Equip Storage	Kitchen	0.47%
20	Equip Storage	Patient Room	0.47%
21	Kitchen	On the Unit	0.47%
22	Kitchen	Supply Storage	0.47%
23	Nurse Station	Staff Toilet	0.47%
24	Patient Room	Kitchen	0.47%
25	Patient Room	Staff Toilet	0.47%
26	Supply Storage	Dirty Storage	0.47%
27	Supply Storage	Document Server	0.47%
28	Supply Storage	Nurse Station	0.47%

APPENDIX A: National Benchmarking Database Description

What is the National Benchmarking Database?

The National Benchmarking Database was created in 2007 in response to the demand from Transforming Care at the Bedside (TCAB) units for shared space to compile and compare their Time Study RN data (aka PDA data) with other facilities. The Benchmarking Database provides an average baseline for how nurses are spending time at or away from the bedside.

The database is anonymous, free, and has over 600 participating units contributing to the data. TCAB/Releasing Time to Care™ participants can use the database to inform their own improvement initiatives and to collaborate and learn from others in Saskatchewan, Canada, and the United States.

What is a TCAB Unit?

Transforming Care at the Bedside (TCAB) is an American program similar to Releasing Time to Care™ (RTC) that aims to improve patient experience, staff wellbeing, efficiency of care, and safety. Like RTC, the program works to help nursing staff spend more time at the bedside so they actively measure their direct care time, non-value added time, and value added time using the same PDAs we are using in Saskatchewan.

Why do we need this database?

The database assists nurses in answering questions about how to improve their work processes to spend more time at the bedside. It also helps examine procedures and policies that may impact the nursing workload. Ultimately, the goal of the database is to help put relevant and timely data into the hands of frontline staff, nursing managers, and leaders to inform their decision-making processes.

The database will also allow units to identify high performing units throughout North America to promote opportunities for collaboration and sharing. Communication with other units is facilitated through a private messaging system that allows users to maintain confidentiality and anonymity.

What does the National Benchmarking Database look like?

The user-friendly web portal allows participants to view their data as well as data from other participating units for learning purposes. Users can also create their templates for categorizing work and generate benchmarks based on those customized category definitions.

APPENDIX B: Safe Staffing Targets

The role of nurses in providing safe, quality care is globally understood by patients and caregivers alike. Despite this global understanding, the modern trend in healthcare administration is to squeeze as much cost as possible out of hospital operations and the number one target is nurse staffing. Nursing associations have responded by proposing “The Registered Nurse Safe Staffing Act” to ensure that the decision makers are providing and implementing adequate and safe nurse staffing plans.

As we learned more about ANA’s Registered Nurse Safe Staffing Act, it became evident that a new approach was needed in the performance improvement disciplines to support the objectives of safe staffing. In addition, 16 years of experience implementing TCAB at 100’s of hospital’s has shaped and informed our view on the definition of “value added care”. **We have determined that RN over-utilization impacts patient safety and that patients/ payors ARE willing to pay to have a nurse available when they need one.**

In an effort to align performance improvement activity with the principles of safe staffing we have introduced the safe staffing targets for Value Added Care, Nurse Utilization, and Patient Hours per Nurse Day in the Time Study RN National Benchmarking Database. The safe staffing targets are calculated using algorithms from heuristics developed in the program and validated in a simulation model that associates staffing levels with safe care delivery.

Dashboard				
	Value Add	Nurse Utilization	Patient hours per Nurse Day	Nurse Hours per Patient Day
Target	67.1%	82.61%	9.91	2.48
Last Measurement	69.12%	83.96%	10.08	2.15
Avg Measurement	69.12%	83.96%	10.08	2.13

The new safe staffing targets are calculated and unique for each unit and are included in the dashboard of the Time Study RN National Benchmarking Database. The purpose of the new targets are to ensure that performance improvement groups using the LEAN model treat nurse availability as a value added activity in healthcare practice, which supports the Registered Nurse Safe Staffing Act objectives.

Safe Staffing Summary

The new safe staffing targets provide the Staffing Committee at each hospital with new insight on determining and monitoring the staffing plan for each nursing unit and comparing “Patient Hours per Nurse Day”, “Nurse Utilization”, and “Value-Added Care” with the 600 other hospital unit datasets in the Time Study RN National Benchmarking Database.