

**DEVELOPING A TIME
AND MOTION
OBSERVATION STUDY
FOR AN ACADEMIC
MEDICAL CENTER:
TO BETTER
UNDERSTAND
CLINICAL NURSING
WORKLOAD**

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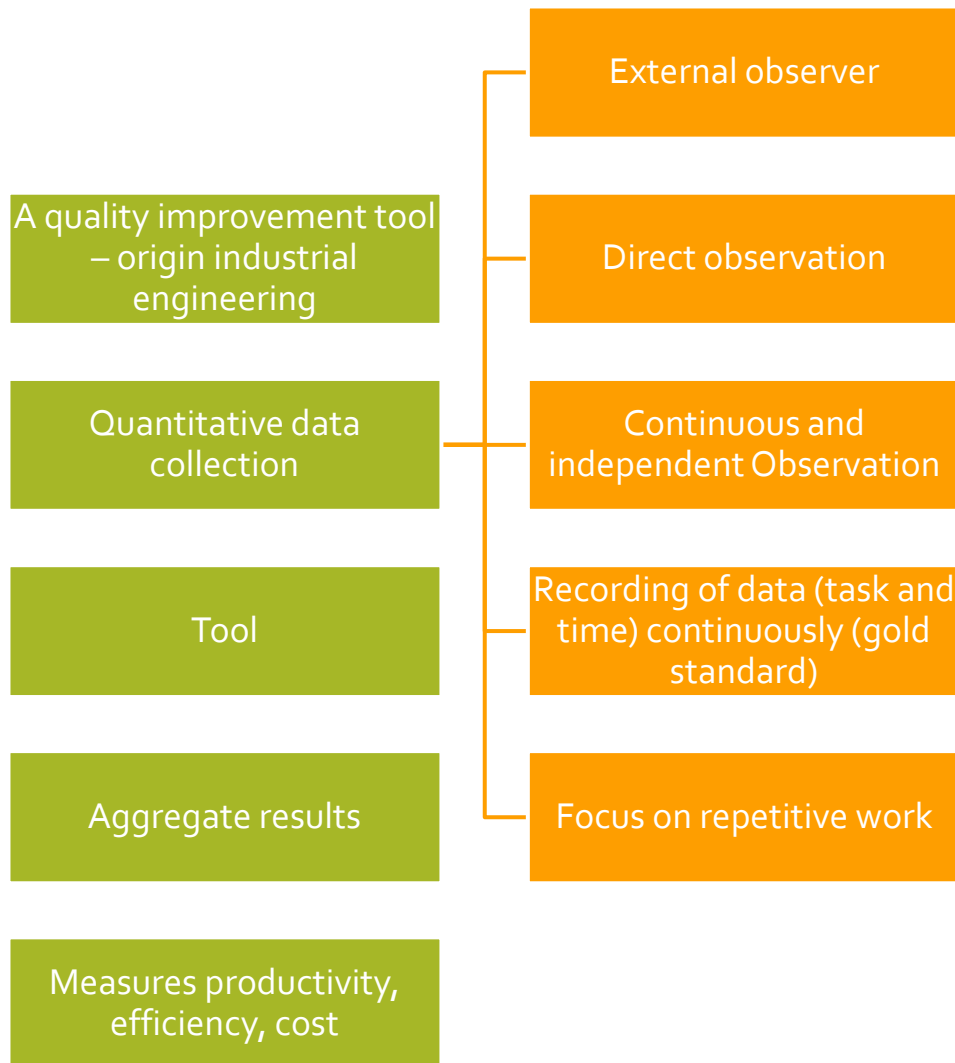


NO CONFLICTS OF
INTEREST



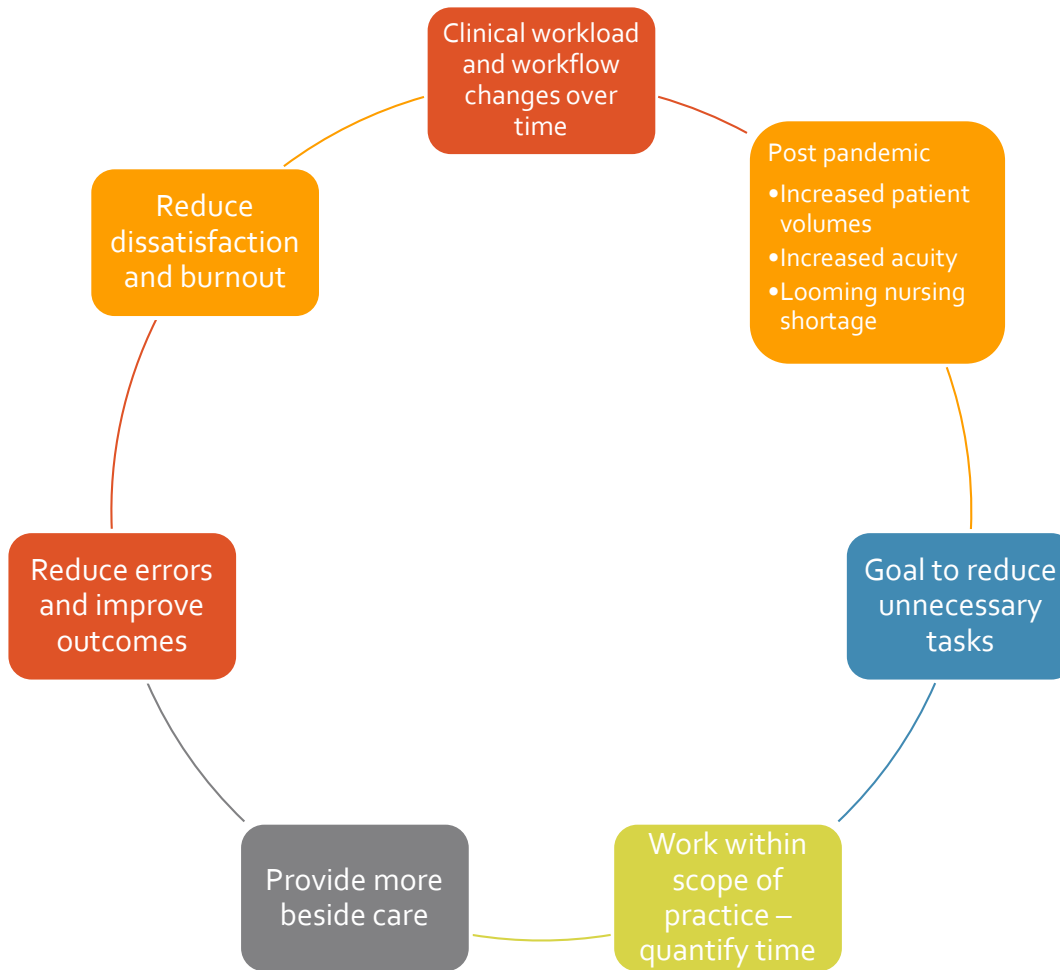
NOTHING TO DISCLOSE

Time and Motion Study (TMS)



TMS in Healthcare

Clinical question – can a quality improvement tool be re-designed and deployed for use in an academic medical center to provide actionable data for clinical nursing workload changes? (Jan 2021)



TMS in Healthcare

The Why?

Time of study (fall 2021) significant lack of literature to support use of tool in acute care setting; studied in health IT not clinical

Process

- IRB (deemed quality improvement)
- Stakeholder engagement
- Participation agreements
- Tool(s) Design
- Utilization training – interobserver reliability
- Data collection
- Data input
- Data analysis
- Recommendations/Next Steps

TMS in Healthcare

The How?

Time and Motion Study Transaction Codes

Dir – VS (tele)	
Dir – Assess	
Dir - Feeding (peg tube)	Locations:
Dir - Bathing	Patient room
Dir - Repositioning	Other
Dir - Ambulate	Supply room
Dir – RR/CODE	Hallway
Dir – Toileting	Nurses Station
Dir – Wound/Drain	Med Room
Dir – Foley care (insertion)	Kitchen
Dir – IV access	Off Unit
Dir – POC/lab collect	
Dir – finger stick	
Dir – hourly checks	
Personal - Meal/Break/Bathroom	
Med Admin – PO	
Med Admin – IV/Pumps	
Med Admin – IM/SC	
Med Admin – Cosign/high alert med	
Med Admin – Retrieve/locate/call/return	
Med Admin – Supplies (?)	
Indir – call bell	
Indir – patient education	
Indir – admission	
Indir – discharge	
Indir – bed change	
Indir – Order Meals	
Indir - help colleague	
Indir – gown	
Indir – belongings	
Indir - nutrition	
Sup/Equip – clean	
Sup/Equip – fill	
Sup/Equip – gather	
Sup/Equip – alarm manage	
EPIC – review	
EPIC – documenting (includes med scanning)	
EPIC - log on (re-start/wait)	
Transport – prep/waiting for pt	
Transport – travel with pt	
Transport - walking	
Transport – looking for help	
Comm – pt/fam	
Comm – LNA	
Comm – on phone	
Comm - PCR	
Comm – page/wait for call	
Comm - handoff	
Comm – rounds	
Comm - MD	
Comm - RT	
Comm - Nutrition	
Comm – RN	

Tool Development – Transaction Codes

□ Develop Transaction Codes

- Iterative Process
- UVMC Practice Council – brainstorm
- Go to the Gemba – talk to staff
- What to include
- What to call tasks
- How to aggregate

#	Time Start	Intervention	Time Stop	Notes	INTERVENTION - CODE/FUNCTION
0700	0704	Safety Huddle	0704	Safety Huddle in clean ready room	DIR - Direct Patient Care
0704	0707	ET&E	0707	Chart-review	Dir - Vital Signs
0707	0711	Indirect/ET&E	0711	Writing her own notecard/report charts	Dir - physical assessment
0711	0714	Nursing report-Comm	0714	Nursing report @ Station -updates	Dir - Feeding Patient
0714	0722	Updating audiotape on pts	0722	Giving quick report to auditor as all vpts are assessed	Dir - Repositioning
0722	0728	Comm - Handoff	0728	Nursing report @ Station per family request	Dir - Ambulating
0728	0732	DIR- Meet pt & family	0732	Meet pt & assessing pain & general condition	Dir - R/CODE
0732	0733	Comm - Handoff/Assess	0733	PCR - Nursing Report, Assess Pain	Dir - toileting
0733	0735	Comm - Nic RN	0735	discussing handoff tonight, personal conversation	Dir - wound care
0735	0736	Comm - Handoff	0736	PCR - Nursing Report @ bedside	Dir - Foley care (insertion)
0736	0739	Personal	0739	Getting belongings from husband	Dir - IV access
0739	0742	Personal	0742	Talking w staff about new labday	Dir - PCR/MS collect
0742	0751	ET&E	0751	Chart review, documenting PCR, Resp reports	Nutrition (ordering meals)
0751	0802	Comm - Handoff/Assess	0802	Handoff to LWA	Med ADMIN
0802	0805	Comm - Context MD	0805	need tele order is accepted, PIVs pulled	Med Admin - PD
0805	0809	ET&E	0809	discussing MD communication	Med Admin - IV/Pumps
0809	0809	Comm -	0809	Re-writing personal report sheet	Med Admin - H/WC
0809	0809	Comm - Context MD	0809	responding to MD context	Med Admin - co-sig/high alert
0809	0809	Indirect - Printing strips	0809	Printing tele strips & marking intervals	Med Admin - retrieve/locate
0809	0809	Comm - LWA	0809	notifying LWA of tele discontinuation	INDIR - FOR THE PATIENT
0809	0811	Dir	0811	Remove tele	Indir - patient education
0811	0814	Comm - N RN	0814	Explain need	Indir - admission
0814	0816	Dir	0816	Boosting pt	Indir - discharge
0816	0815	Comm - Nic RN	0815	Update	Indir - bed change
0815	0826	Dir	0826	Cleaning & setting up	Indir - ordering meals (nutr)

Time and Motion Study

Date: 11/22/11
Unit: Miller 3
Observer: Jada Barton
Shift/Times: Day (120, 118, 313)
Pt assignments:
Room numbers:
Isolation room:
Sitter room:

Start Time	Task/Intervention	End Time	Comment(s)	Duration
1216	looking for physician - dlt dlc	1217	has not been correct	1217
1217	Reviewing dlc instruction	1221	preparing those for pt.	1221
1221	Grabbed Supplies - Spoke w Pt new	1222	Supply Person (3308)	1222
1222	Looking for Endocrine NP	1223	found NP-Riley	1223
1223	Grabbed more Sup plus from main Supply RM	1224		1224
1224	Relayed message to pt	1224		1224
1224	# pt - Reviewing instructions @ pt (3312)	1230		1230
1230	Interrupted by pt. of thing phone call	1235		1235
1235	Removed IV's	1237		1237
1237	thpted pt get ready to dlc.	1238		1238
1238	Changed pt dsg prior to leaving	1243		1243
1243	Speaking & Secret to assign transport	1244		1244
1244	Finishing up @ pt's dlc - cleaning up floor of the Room	1245		1245
1245	Throwing out extra Meats	1245		1245
1245	Speaking & wife / preparing to pt. dlc Room	1252		1252
1252	pt's wants wife to hear dlc instructions	1252		1252
1252	pt Support arrived to bring pt out	1252		1252
1252	Checking in on 310 - speaking & family	1256		1256
1256	Checking in on 308 Endocrine education pt. E (no pump)	1257		1257
1257	Signing in to Epic - Reviewing Orders / Documenting	1303		1303
1303	Documenting in Epic	1303		1303
1303	Documenting Meats Changing orders - got another RN to go sign	1306		1306
1306	Getting Meats + water	1309		1309

Time and Motion Study

Date: 11/22/11
Unit: Miller 3
Observer: Laura Muir
Shift/Times: Day (1215 - 1400)
Pt assignments: 1p15
Room numbers: 312, 310, 308, 311
Isolation room:
Sitter room:

Start Time	Task/Intervention	End Time	Comment(s)	Duration
1216	looking for physician - dlt dlc	1217	has not been correct	1217
1217	Reviewing dlc instruction	1221	preparing those for pt.	1221
1221	Grabbed Supplies - Spoke w Pt new	1222	Supply Person (3308)	1222
1222	Looking for Endocrine NP	1223	found NP-Riley	1223
1223	Grabbed more Sup plus from main Supply RM	1224		1224
1224	Relayed message to pt	1224		1224
1224	# pt - Reviewing instructions @ pt (3312)	1230		1230
1230	Interrupted by pt. of thing phone call	1235		1235
1235	Removed IV's	1237		1237
1237	thpted pt get ready to dlc.	1238		1238
1238	Changed pt dsg prior to leaving	1243		1243
1243	Speaking & Secret to assign transport	1244		1244
1244	Finishing up @ pt's dlc - cleaning up floor of the Room	1245		1245
1245	Throwing out extra Meats	1245		1245
1245	Speaking & wife / preparing to pt. dlc Room	1252		1252
1252	pt's wants wife to hear dlc instructions	1252		1252
1252	pt Support arrived to bring pt out	1252		1252
1252	Checking in on 310 - speaking & family	1256		1256
1256	Checking in on 308 Endocrine education pt. E (no pump)	1257		1257
1257	Signing in to Epic - Reviewing Orders / Documenting	1303		1303
1303	Documenting in Epic	1303		1303
1303	Documenting Meats Changing orders - got another RN to go sign	1306		1306
1306	Getting Meats + water	1309		1309

Time and Motion Study - Data Collection Tool

Start Time	Intervention	Time Stop	Notes
1216	looking for physician - dlt dlc	1217	has not been correct
1217	Reviewing dlc instruction	1221	preparing those for pt.
1221	Grabbed Supplies - Spoke w Pt new	1222	Supply Person (3308)
1222	Looking for Endocrine NP	1223	found NP-Riley
1223	Grabbed more Sup plus from main Supply RM	1224	
1224	Relayed message to pt	1224	
1224	# pt - Reviewing instructions @ pt (3312)	1230	
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1235	Removed IV's	1237	
1237	thpted pt get ready to dlc.	1238	
1238	Changed pt dsg prior to leaving	1243	
1243	Speaking & Secret to assign transport	1244	
1244	Finishing up @ pt's dlc - cleaning up floor of the Room	1245	
1245	Throwing out extra Meats	1245	
1245	Speaking & wife / preparing to pt. dlc Room	1252	
1252	pt's wants wife to hear dlc instructions	1252	
1252	pt Support arrived to bring pt out	1252	
1252	Checking in on 310 - speaking & family	1256	
1256	Checking in on 308 Endocrine education pt. E (no pump)	1257	
1257	Signing in to Epic - Reviewing Orders / Documenting	1303	
1303	Documenting in Epic	1303	
1303	Documenting Meats Changing orders - got another RN to go sign	1306	
1306	Getting Meats + water	1309	

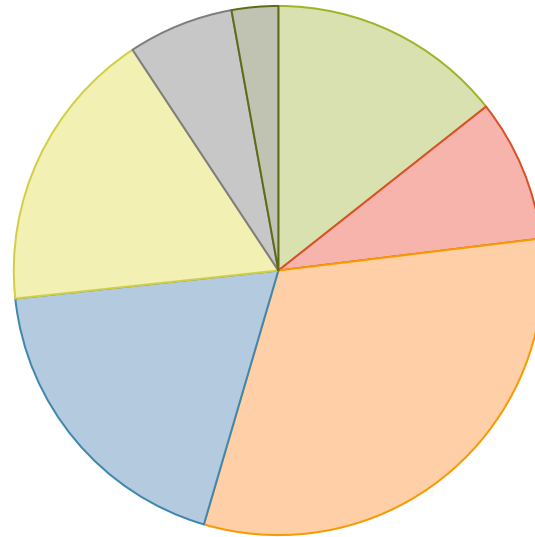
Tool Development - Data Collection

- ❑ Develop data collection tool
- ❑ Iterative process
- ❑ Interrater reliability
- ❑ Patient acuity
- ❑ Staff feedback

Data Collection

- Setting – Inpatient nursing units
 - General medicine (32 bed double occupancy)
 - Surgery (30 bed single occupancy)
- Data Collection (7/5/2021 – 8/30/2021)
 - 14 Shifts (unique nurses)
 - 130 Hours (7827 minutes) total time
- Data Analysis
 - Single abstractor
 - 30 hours
 - Worked with Data Management Office

Percent Time per Shift – Average Across Units



Direct Pt Care Indirect Pt Care Communication EPIC Med Admin Supplies/Equip Personal

Results

Results (both units – by category)

Activity	Total time - percent	Minutes in shift	Hours in shift	
Direct Patient Care	18%	86	1 h 26 min	+
Indirect Patient Care	10%	48	48 min	= 2h 14 min
Communication	31%	149	2 h 29 min	+
EPIC	21%	101	1 h 41 min	= 4h 15 min
Med Administration	13%	62	1 h 2 min	
Supplies/Equip	5%	24 min	24 min	
Personal	2%	10 min	10 min	

Results (both units)

Direct Patient Care	Total time
Assessment	25%
Repositioning	16%
Hourly Checks/Rounds	13%
Vital Signs	11%
POC/Lab Collect	7%
Toileting	7%
Ambulate	6%

Indirect Patient Care	Total time
Nutrition	48%
Call Bell	15%
Patient Education	13%
Gown/Isolation	10%
Help colleague w/pt	5%
Bed change	4%

- Begin drill down

- Nutrition – approximately 30 minutes per 8-hour shift spent addressing nutrition issues: setting up meals, removing trays, ordering meals (on hold), bringing drinks

- Is this the correct time distribution?

- Are we working at the top of our RN license?

Study Challenges



- Interruptions
- Disruptions
- Multi-tasking (time stamp)
- Fast pace
- Clinical nuances
- Being “watched”

Study Recommendations

- Reduce documentation burden
- Improve equipment availability
- Review Medication Administration
- Increase delegation and work distribution
- Optimize ancillary/support teams
 - Nutrition Services
 - Supply Chain
 - Pharmacy
- Consider care delivery redesign



Why use QI with clinical nurses?



Grass Roots



Best eyes and ears
we have



Often best
solutions



Increase
engagement



Improve workflows
– standard work



Quality Control –
Kamishiba cards



Study Opportunities

- Be creative
- Look at technology
- Teach nurses how to lead – delegate – run teams
- Work to top of licensure
- Building a more sustainable 'workload'
 - Will attract new nurses
 - Will retain current nurses
 - Will allow time for breaks and meals and talking to colleagues

The Time is Now...

Analyze	Further analysis of T&M study data
Change	Determine changes that we need to make
Remove Waste	What work can we take away or reassign
Future	Future State: Team Based Models of Care, Virtual Nursing, Technology

References

1. Lim ML, Ang SY. A time–motion observation study to measure and analyse clinical nursing workload in an acute care hospital in Singapore. *Proceedings of Singapore Healthcare*. 2019;28(2):124-128. doi:10.1177/2010105819834569
1. Kai Zheng, Michael H Guo, David A Hanauer, Using the time and motion method to study clinical work processes and workflow: methodological inconsistencies and a call for standardized research, *Journal of the American Medical Informatics Association*, Volume 18, Issue 5, September 2011, Pages 704–710, <https://doi.org/10.1136/amiajnl-2011-000083>
1. Westbrook JL, Duffield C, Li L, Creswick NJ. How much time do nurses have for patients? A longitudinal study quantifying hospital nurses' patterns of task time distribution and interactions with health professionals. *BMC Health Serv Res*. 2011 Nov 24;11:319. doi: 10.1186/1472-6963-11-319. PMID: 22111656; PMCID: PMC3238335



QUESTIONS