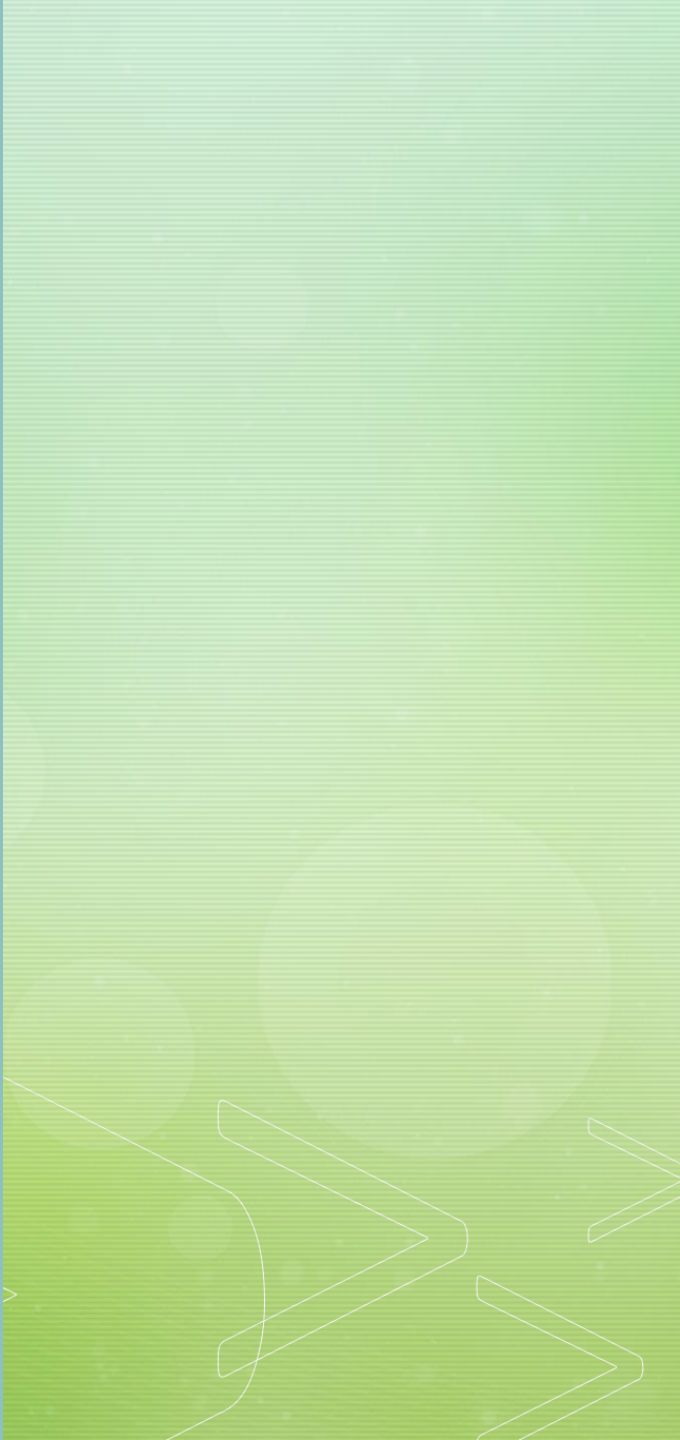


A Study on Medication Turnaround Time in Inpatient Pharmacy at Narayana Multispecialty Hospital, Jaipur



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Nurse

Orders items

**Clinical
Pharmacist**

Checks &
approves

Pharmacist

Generates or
rejects indent

**Dispensing
Pharmacist**

Keeps items
in baskets

Runner

Delivers
basket to
wards



Objective

- To observe the process flow of IPD & determine TAT
- To identify the bottleneck present in the process flow of IPD in real time
- To suggest remedial measures to improve efficiency of the process flow and shorten TAT of IPD to ensure delivery of medicines and surgical items on time

- Heather Naylor, Dona M M Woloschuk, Patric Fitch, Sarah Miller (2011) “Retrospective Audit of Medication Order Turnaround Time after Implementation of Standardized Definitions” Can J Hosp Pharm 2011 Sep-Oct; 64(5): 346–353. [internet]
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3203827/> (last accessed on 8.5.'19)

Aim was to evaluate of differences in median dispensary turnaround time and in median total turnaround time for stat/emergent and urgent/now orders before and after implementation of the standardized definitions

Retrospective audit of turnaround time was carried out in baseline and post intervention stage

No significant decrease in total or dispensary turnaround time with implementation of standard definitions. Majority of orders met the target dispensary turnaround time. It supports the concept of interdisciplinary interventions for reducing total turnaround time

Results indicated that implementation of definitions as stat, emergent, urgent, and now orders within a hospital in pharmacy was ineffective in improving medication turnaround time

- Heather Neville, Lisa Nodwell, Sahar Alsharif (2012) “Evaluation of Medication Turnaround Time Following Implementation of Scanning Digital Prescriber Order Technology” Can J Hosp Pharm. 2014 Nov-Dec; 67(6): 410–415 [internet] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4275136/> (last accessed on 9.5.'19)
- Aim of this study was to evaluate medication turnaround time before and after implementation of DST for all medications specially for antibiotics
- Retrospective study was carried out for periods before and after implementation of DST in two hospitals at one health region Implementation of DST showed a result with significant decrease in medication turnaround time
- total turnaround time for all medications did not differ significantly
- Regular evaluation of was recommended to compare with benchmarks to measure effects after implementation of new policy and new technology



- Diksha Shroff, Brayal Dsouza, Dr Avinash Shetty, Manthan D Janodia (2019) “A Study on Turnaround Time of Online Indentation of Medicines in a Tertiary Care Hospital” IJMET: Vol.- 10, Issue 01, January 2019, p 527–533
- Prospective observational study was carried out in the inpatient pharmacy
- Total waiting time for medicines to reach wards in first, second, third floor
- Factors affecting turnaround time had been observed such as indent picking and sequencing problem, efficiency of the packaging staffs, system errors, long break, frequent enquiry calls
- Study revealed that even after adopting technology there were issues and delay



- Jodi C Rocker et al.(2006) “Evaluation of Turnaround Time for Medication Order Processing with Use of a Novel Scanning System” HOSP PHARM. 41. 10.1310/hpj4103-249
- Aim of this research study was to evaluate the efficiency in turnaround time using a novel scanning system developed by the information services
- In two phases medication turnaround time had been observed
- Result revealed that use of a novel scanning system had a positive impact

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- Dr. Farheen Zeba Siddique (2016) “Turnaround Time of IP Pharmacy, Monitoring Medication Errors and Material Management of Central Store, OT Store and Pharmacy” IJIR: Vol-2, Issue-10, 2016
 - Cross sectional study was done in in-patient pharmacy at a multispecialty hospital. Non probability convenient sampling method was used. Interview of staff, preparation of checklist and observation of pharmacy indents
 - Aim of the study was to assess the turnaround time in in-patient pharmacy, to identify the various types of medication errors and material management
 - Some of the reasons for the delay in medication dispensing were negligence of employees, staff shortage on some days, medicines stockout, software issues

- Vijay Pr^uratap Raghuvanshi, Himanshi Choudhary (2013) “Medication Turnaround Time in Hospital Pharmacy Department” International Journal of Research and Development in Pharmacy and Life Sciences August - September, 2013, Vol. 2, No. 5, p 626-630
- Aim of this research study was to find out the delays in the order and delivery system of in-patient pharmacy and check the average total time consumed in delivering
- Time motion study was done in the inpatient pharmacy Peak hours of indent order, Average number of indents per day were observed.
- Results revealed that all types of indents were delayed. Delay reasons were random indents from wards, lot of load on the department, repeated indents, stock variability

- Kristine Eves S. Garcia, Antonie Kyna S. Lim, Kenaz Duane Peter A. Segaya, Monet M. Loquias, Lucina Concepcion E. Salazar (2017) “Analysis of the Medication Turnaround Time in a Tertiary Government Hospital” Philippine Journal of Health Research and Development (PJHRD) Vol. 21, No.4 (2017)
- Objective was to evaluate the medication turnaround time of new and stat medication orders of the pharmacy and identify the common factors associated with delays
- Data was collected using forms, time and motion logs Interviews with pharmacists and watchers
- Dispensary turnover time of pharmacies were significantly different from the protocol times
- Administrative protocol and personal factors that led to delays were identified which could be targeted

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- Bernhard Breil, Fleur Fritz, Volker Thiemann, Martin Dugas (2011) “Mapping Turnaround Times (TAT) to a Generic Timeline: A Systematic Review of TAT Definitions in Clinical Domains” BMC Medical Informatics and Decision Making 2011, [internet] <http://www.biomedcentral.com/1472-6947/11/34> (last accessed on 10.5.'19)
 - Research shows a systematic review of literature concerning different turnaround time definitions.
 - Objective was to collect and analyse relevant literature regarding process time
 - Standard timeframe was designed through a consensus process to provide an overview
 - Using turnaround times to benchmark clinical workflows were not easy but mapping of turnaround time definitions to a generic timeline was feasible



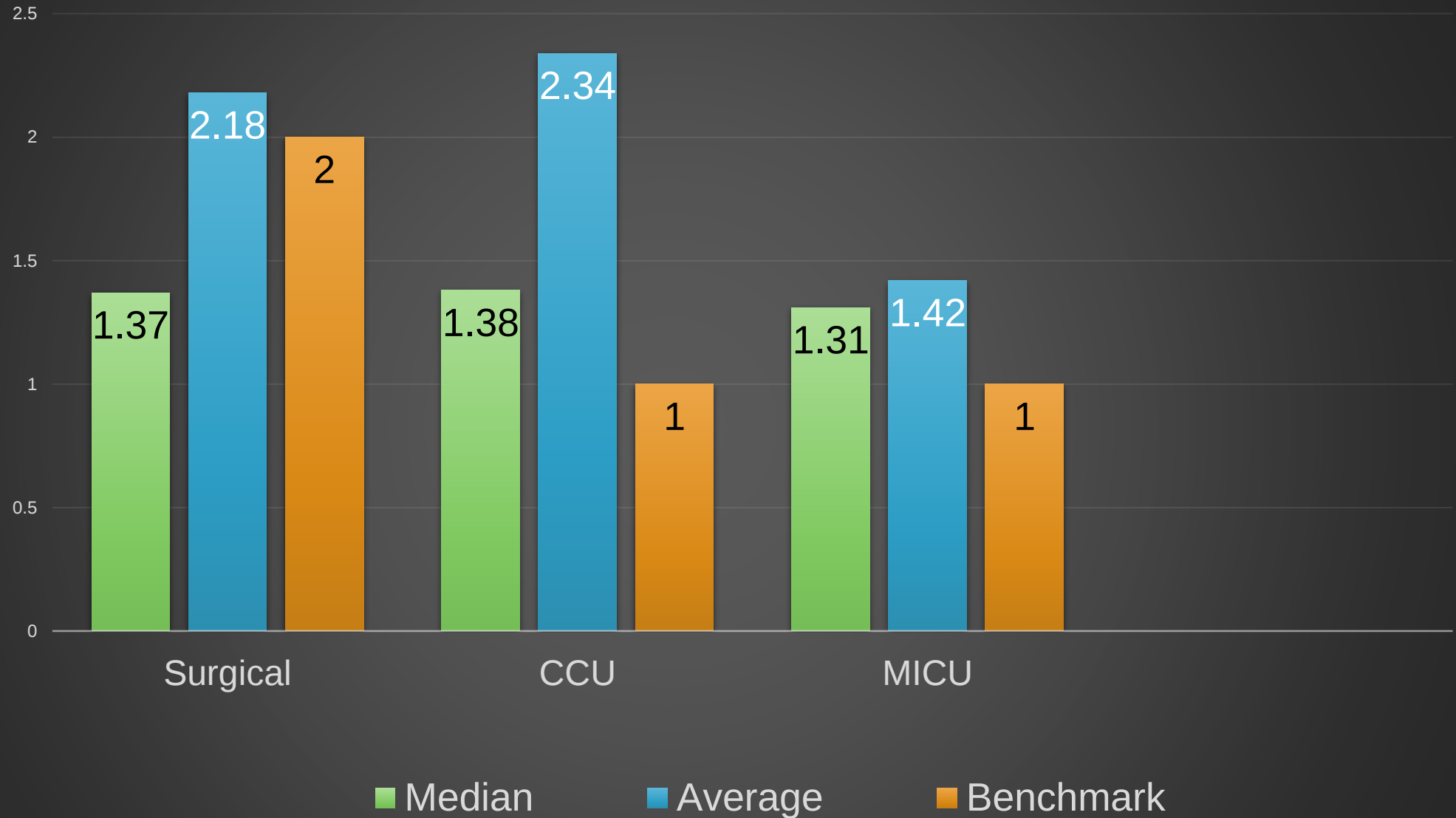
- F Caracuel, U Baños, ML Moya, S Santana, E Romero (2014) “Turnaround time for urgent or restricted prescriptions for drugs from the pharmacy dispensary” European Journal of Hospital Pharmacy: Science and Practice 2014; 21: A64-A65.
- Aim was to measure the time taken for technicians to dispense medicines in the pharmacy and to analyse handwritten prescriptions
- Study was conducted in a tertiary hospital. All handwritten orders were collected and observed for specific time period
- Most common causes of delay in preparation was lack of awareness of technician that high number of orders had arrived that needed pharmacist consultation, medicines stockout though half of the handwritten orders were not justified as urgent

■ Chosen Wards -

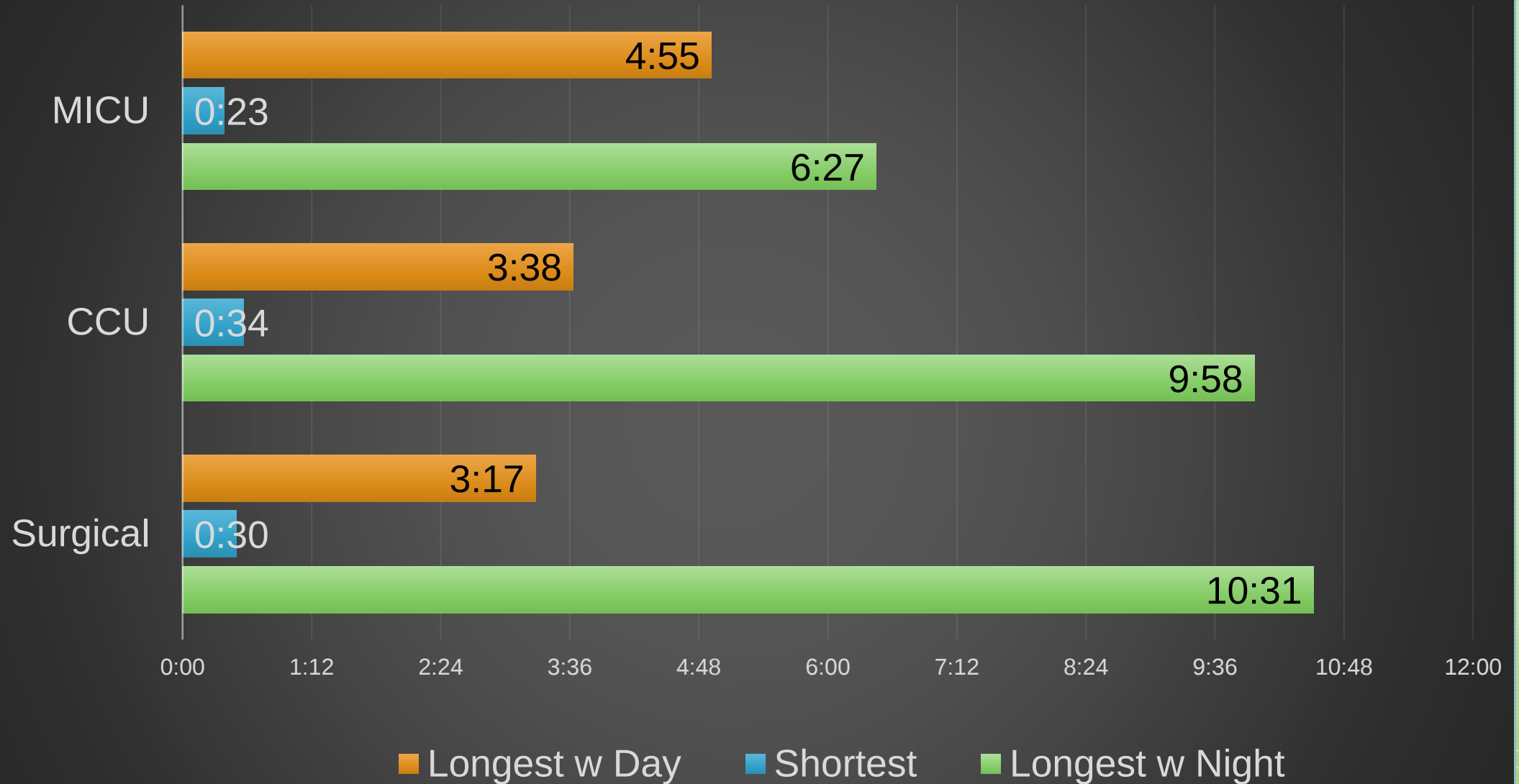
- MICU
- CCU
- Surgical Ward

- **Total Sample Size -** 426 (142 / ward)
- **Sampling Technique -** Convenience sampling
- Time period – 3 month (February – May)
- Study Type – Observational, Applied, Cross sectional

Average / Median Turnaround Time

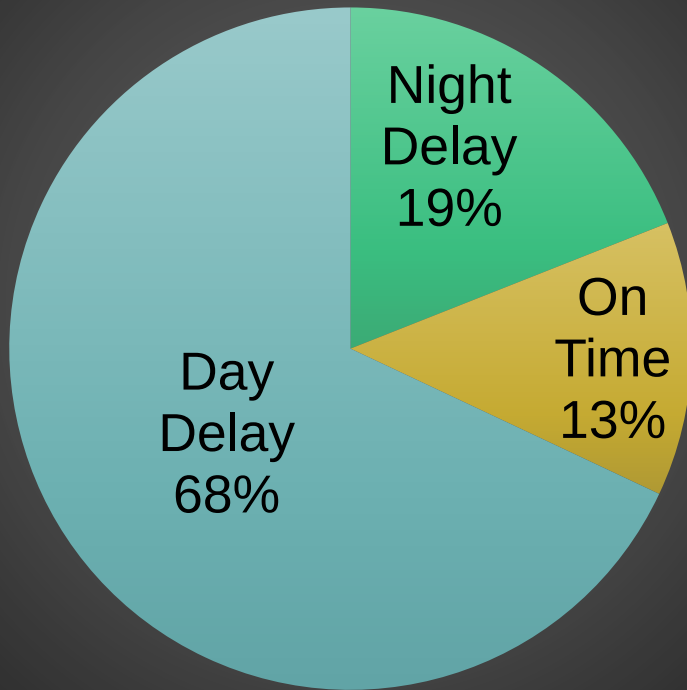


Longest / Shortest Turnaround Time

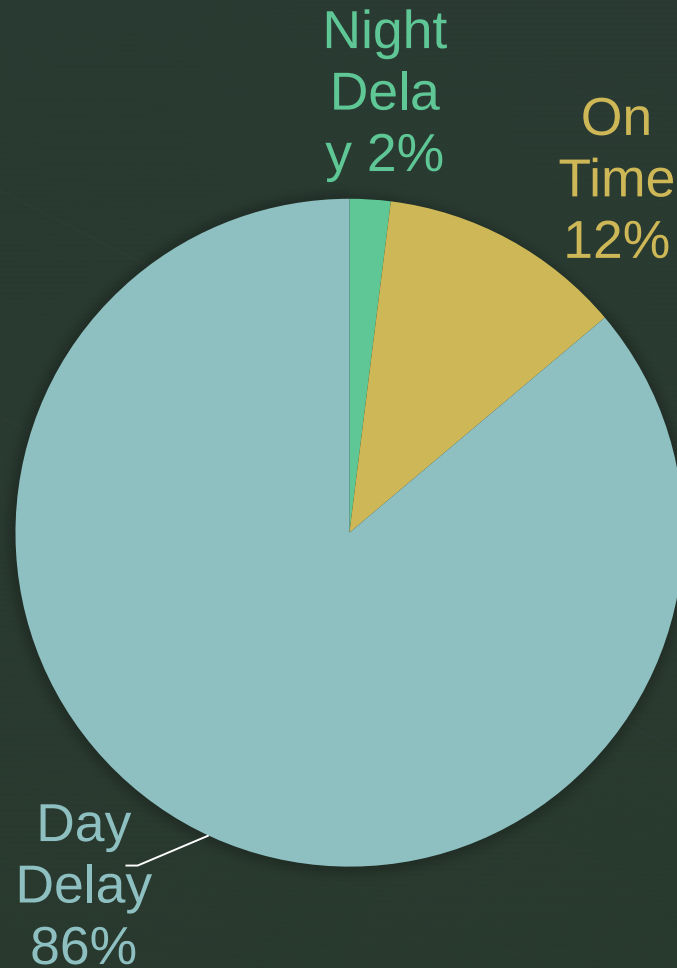


Total Delay / On Time %

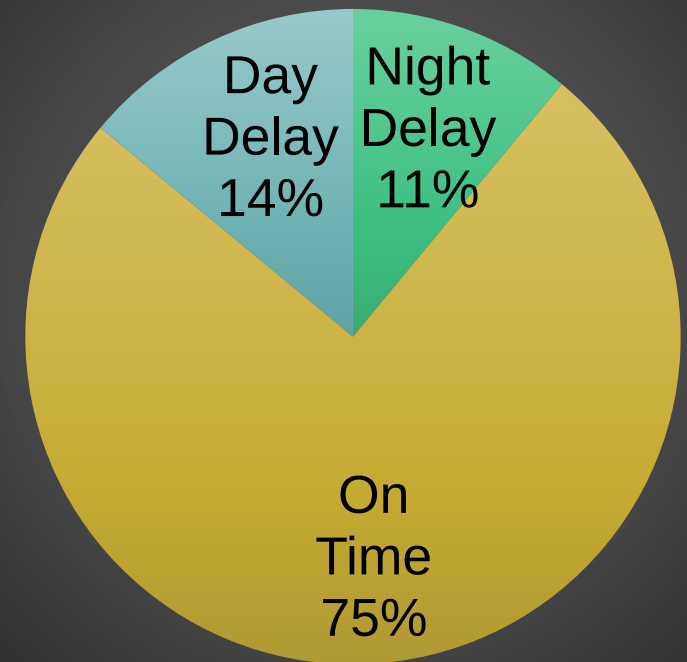
CCU



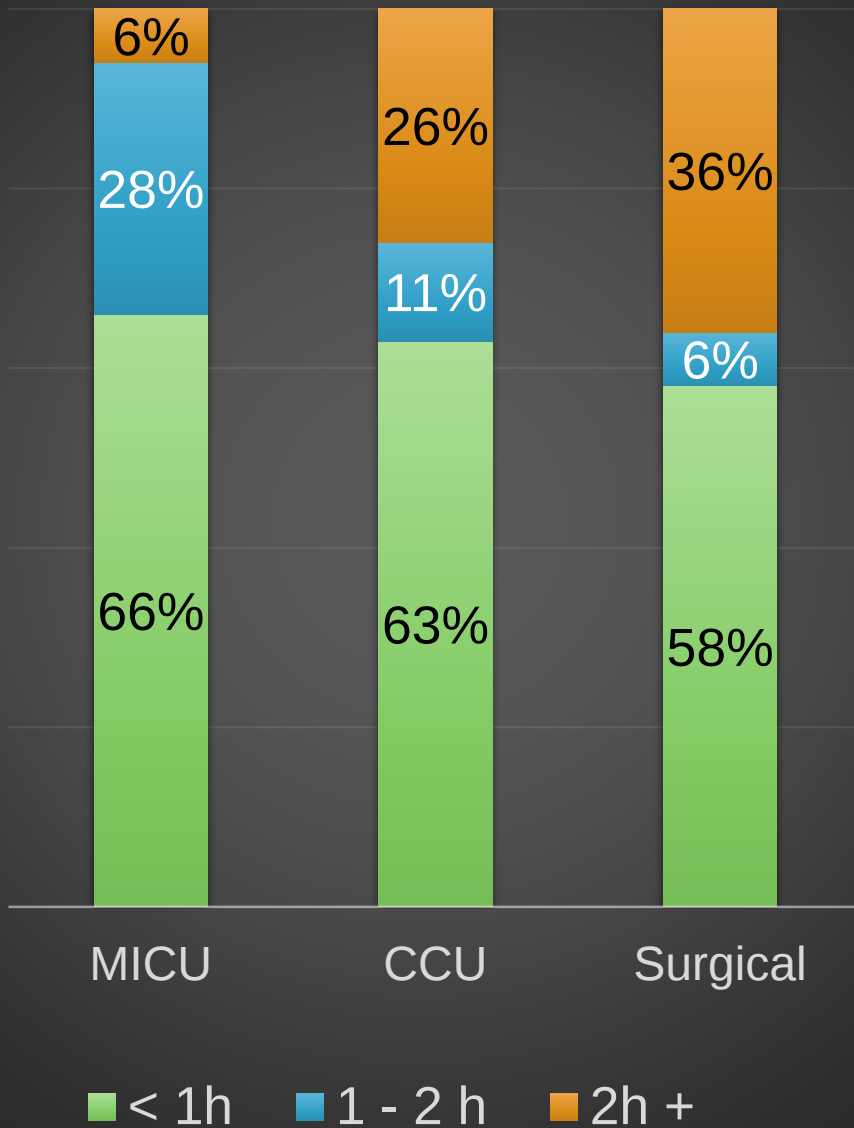
MICU



Surgical



Duration



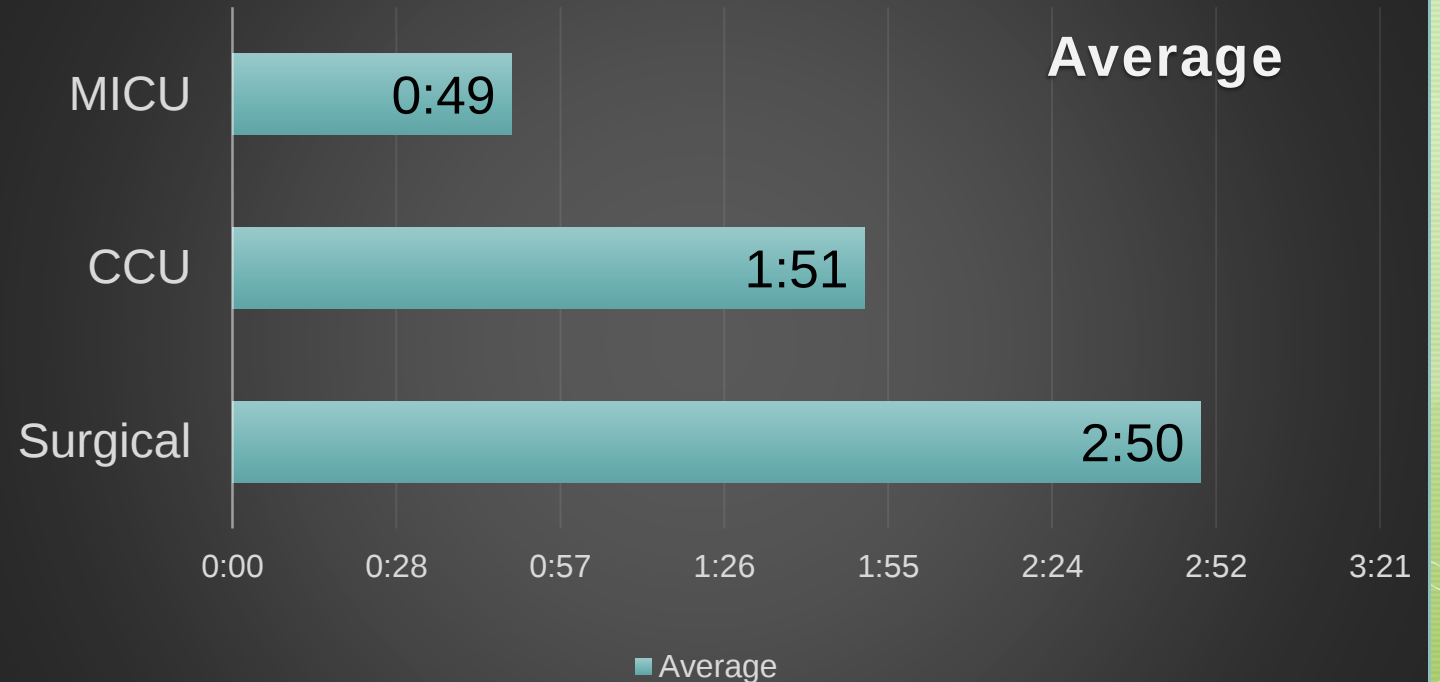
Delay

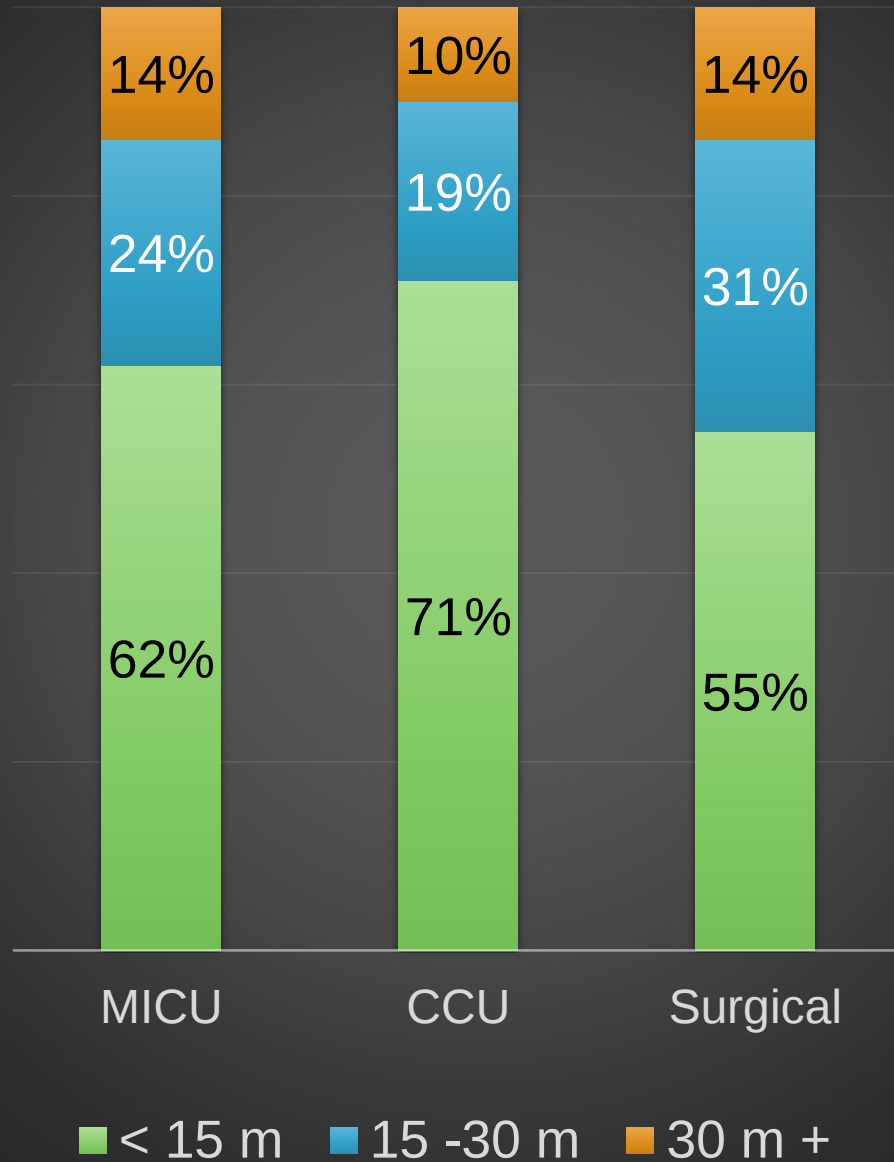
Total cases = 284 / 426

MICU (n = 125)

CCU (n = 123)

Surgical (n = 36)

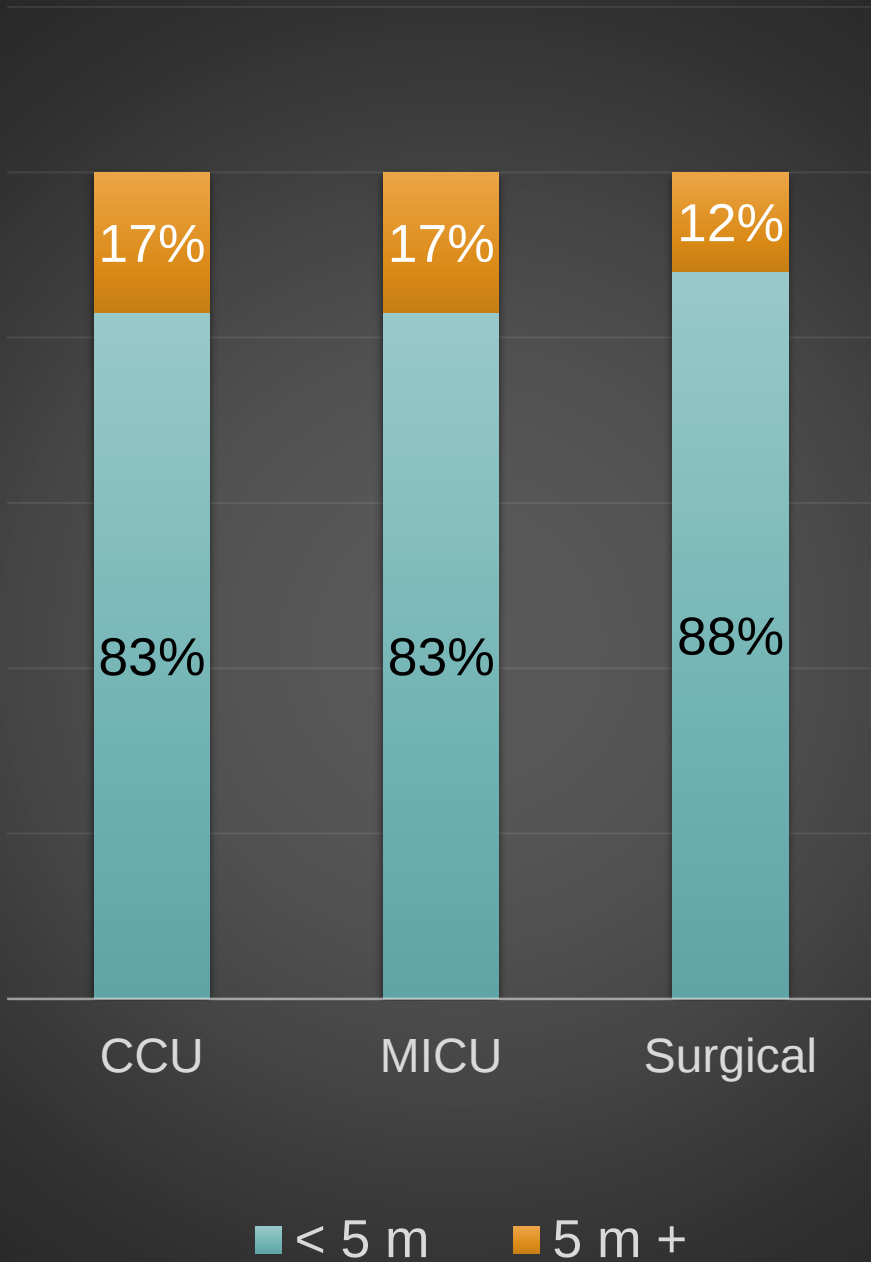




Clinical Approval Time

Time gap between ordering items by nurses and approval by clinical pharmacist

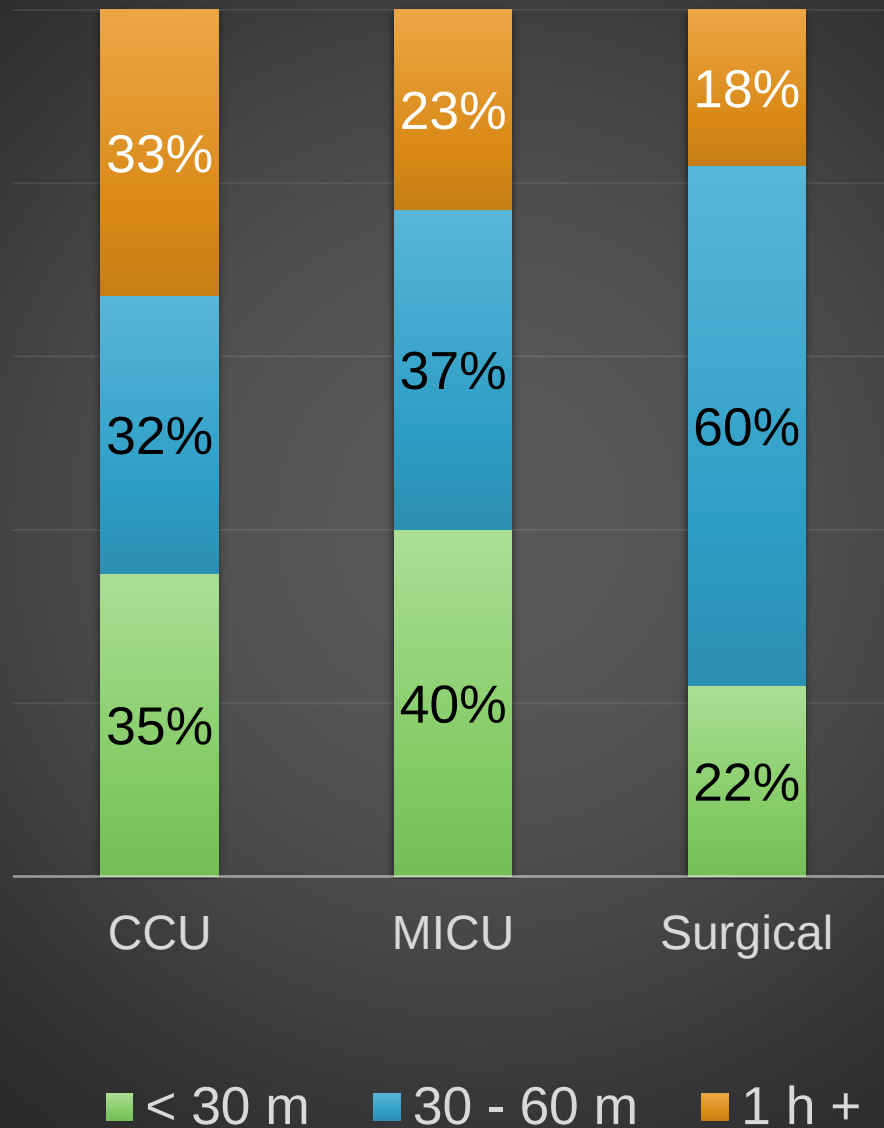
	Average	Highest	Lowest
MICU (n =82)	14 m	1 h 2 m	0 m
CCU (n =93)	11m	49 m	0 m
Surgical(n=106)	15 m	52 m	0 m



Indent Process Time

Time taken to take print out after clinical approval to dispense items

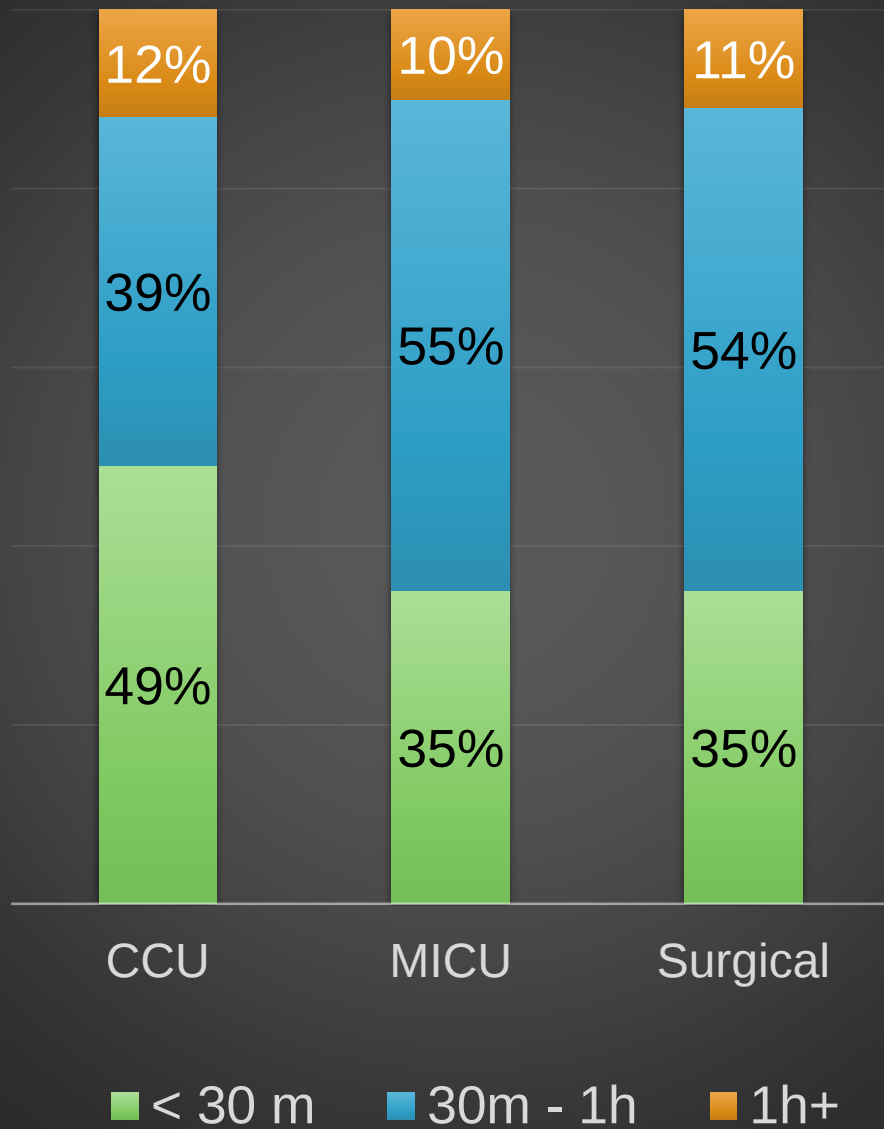
	Average	Highest	Lowest
CCU (n =93)	2m	9m	0m
MICU (n =82)	2m	10m	0m
Surgical (n=106)	2m	9m	0m



Dispensing Time

time taken for dispense and keeping items in basket to be delivered after taking indent print out

	Average	Median	Highest	Lowest
CCU	1h 38m	43m	9h 24m	4m
MICU	43m	34m	2h 47m	1m
Surgical	1h 22m	43m	9h 19m	3m

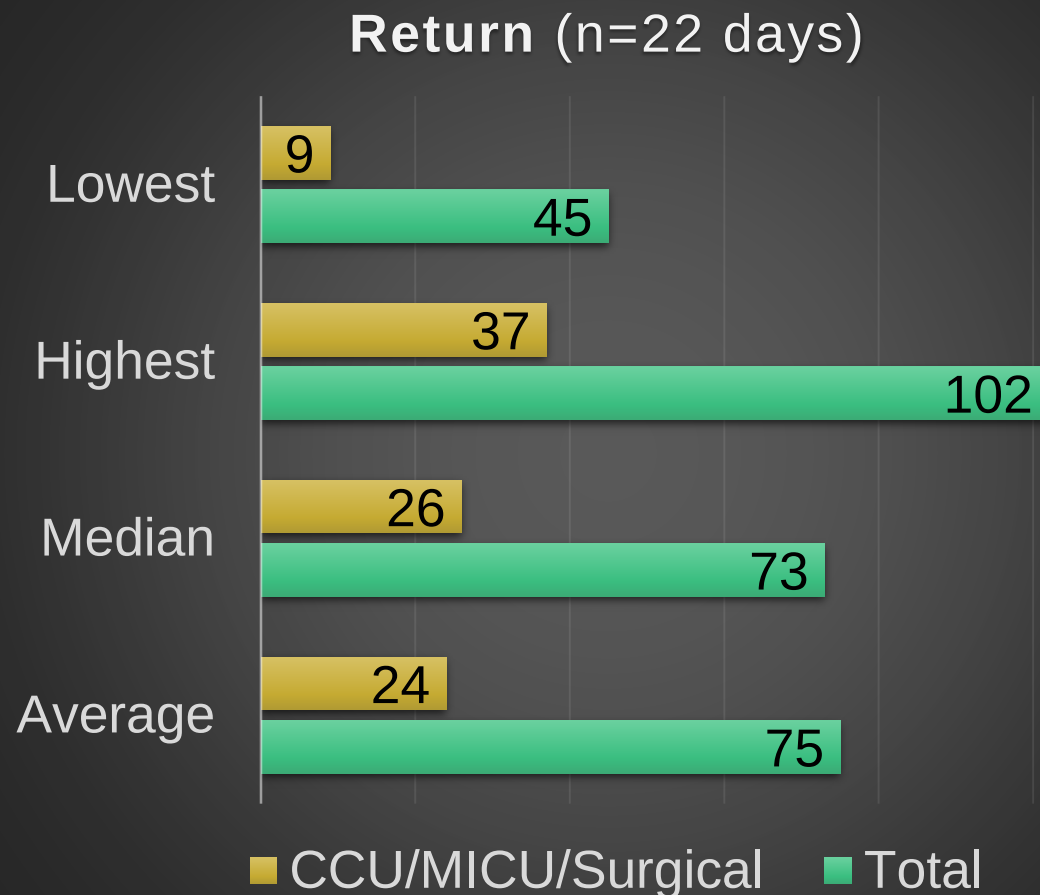


Runner Delivery Time

delivery to wards after items are kept in basket

	Average	Highest	Lowest
CCU	33m	2h	4m
MICU	35m	1h 55m	5m
Surgical	36m	1h 37m	5m

Problems / Delay Reasons & Suggestive Remedial Measures



1. Daily return of items to IPD

- Over stock of medicines in the wards should be avoided to minimize return of items to IPD.

Problem	Solution
2. Indents being rejected due to - items with wrong code - generic / brand issue, type - unavailability On average indent rejection rate 1/5 i.e 20%	Nurses should be aware of items with right code to minimize indents rejection
3. Repetitive indents ordered by nurses for a single patient within short span of time. Average 4 MRN are repeated within 30 min. daily.	Repetitive ordering by nurses with less items should be replaced with maximum items in single indent preferably at specific time frame

Problem	Solution
4. Habit of idle runners for waiting medicines and surgical items to be dispensed for specific ward	Delivery of runners to various wards should be repetitive with short interval time
5. Unavailability of physical stock of items in IPD. Daily on average 5 items remain unavailable at dispensing time in IPD	Dispensing pharmacist should have knowledge of the exact presence of the item in the hospital.
6. Often dispensing process become slower with regular activities like audit. Process becomes bottleneck when only one pharmacist dispenses	Different time schedule should be introduced for audit and dispensing process. Both should not be done together. Audit should be done preferably at night

Problem	Solution
7. Longer time of clinical approval process. Pending task clearance problem	Before handover to the next person all the pending tasks should be cleared
8. Absenteeism, turnover among pharmacists. 3 dispensing pharmacist left between March - April	Motivated manpower is required to handle IPD workload
9. Medicines, surgical items ordered at night not being dispensed and delivered create extra load in IPD causing further delay for items freshly ordered at morning. (44 cases)	Items ordered at night should not be left for dispensing pharmacist at morning shift



Suggestive Individual Process Time Benchmark

		CCU / MICU	Surgical
Clinical approval	-	15 m	30 m
Indent process	-	5 m	10 m
Dispense	-	20 m	50 m
Delivery	-	20 m	30 m
Total	-	1 h	2 h



Thank you

