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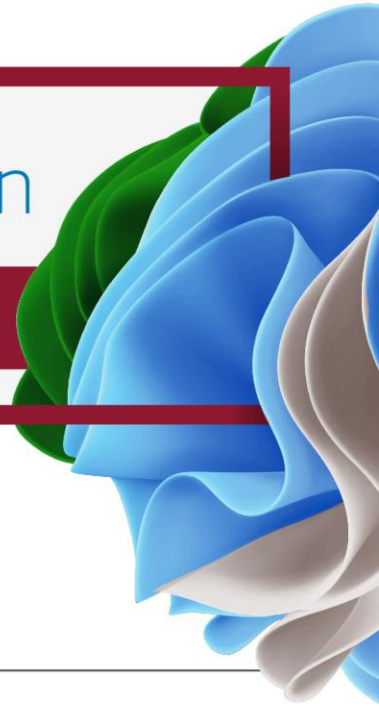
Institute *for* Healthcare Improvement

Middle East Forum on Quality & Safety in Healthcare **2023**

16-19 March, Doha



Healthcare Resilience in Extraordinary Times

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Effect of Applying Lean Management Tools During Covid19 Pandemic in Critical Care Units

Muna Al Shaqsi
RN, BSN, CCNPNP
Certified transformational coach
Black belt lean six sigma
Head nurse of PCCU and ER
Royal Hospital
Oman

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Conflict of Interest

The speaker(s) or presenter(s) in this session has/have no conflict of interest or disclosure in relation to this presentation.

Learning Objectives

At the end of this session, participants will be able to:

1. Know about the history of Lean in the Royal Hospital (RH)
2. Identify the challenges during covid
3. Understand experience of RH on projects sustainability before, during, and after covid 19

Introduction

- The Covid-19 pandemic pushed healthcare systems around the world to unexpected challenges and limitations.
- Process improvement in healthcare had tendency to cut capacity and flexibility in order to meet excessive demand during covid pandemic.
- Few literatures concluded in their research that application of the Lean management approach is able to increase the effectiveness and efficiency of health services during covid 19.
- Some of institutions modified its way of operating and organizational structure to eliminate unnecessary steps in the management of patient flow and adopt lean tools.

Features May 8, 2020 Planet Lean

Webinar: lean healthcare vs the Coronavirus

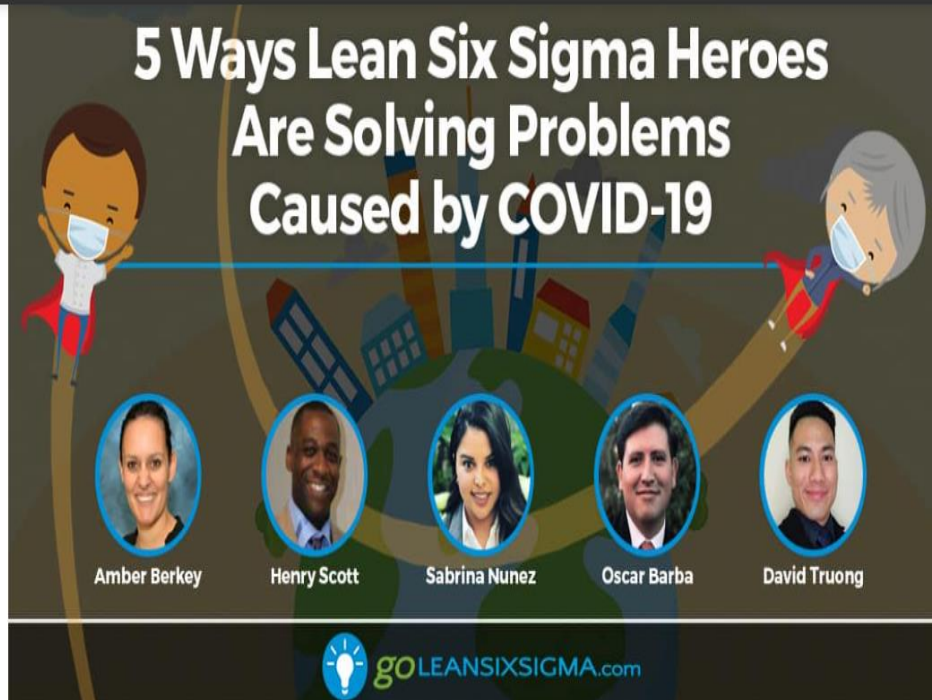
TAGS

lean coaching | Lean cross-pollination | Lean Global Network | lean healthcar | Lean in an emergency | lean leadershi

RELATED POSTS

goLEANSIXSIGMA.com

What Is Lean Six Sigma? Yellow Belt Green Belt Black Belt Industries



Royal Hospital Lean Champions 2017

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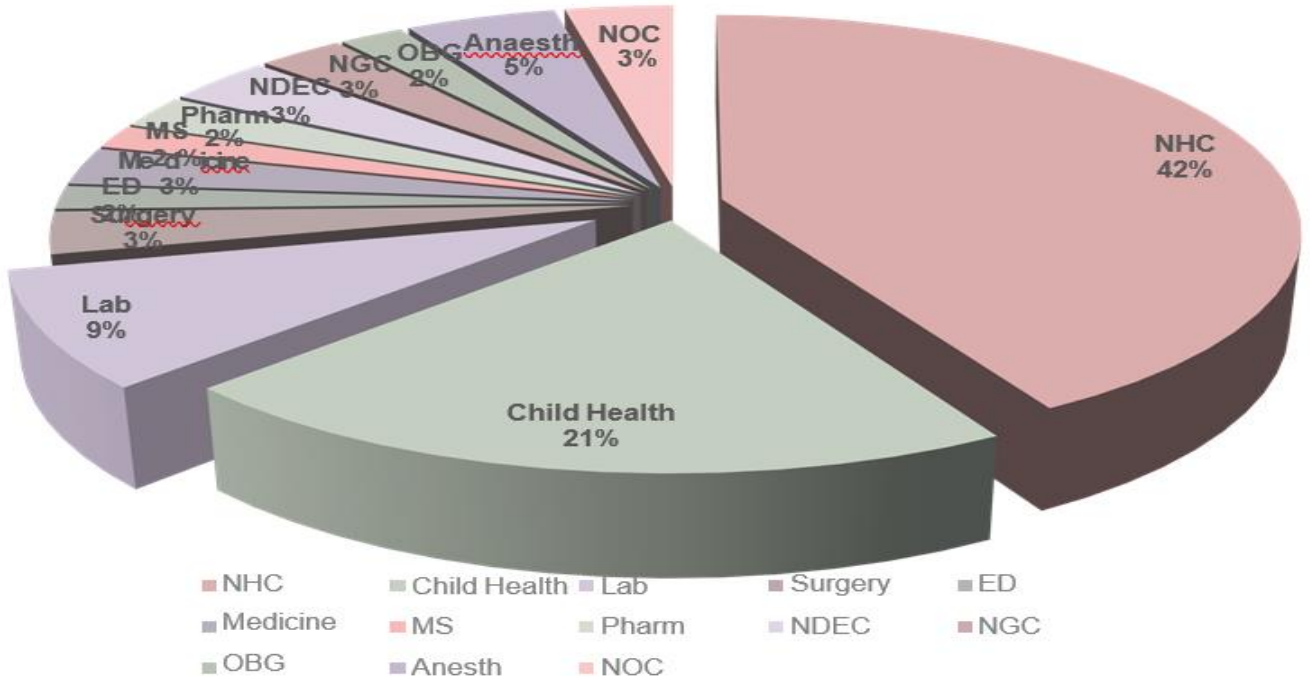
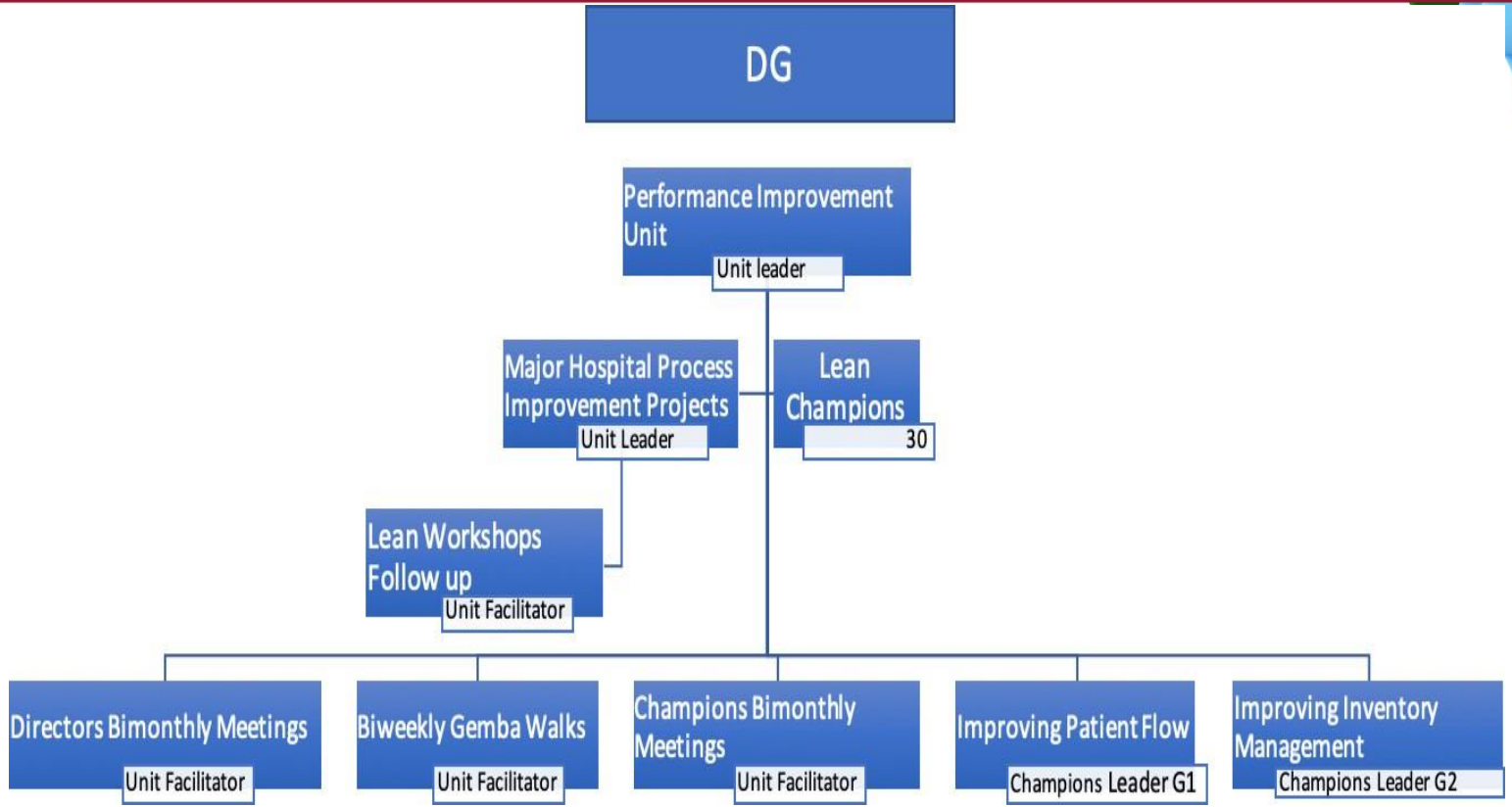
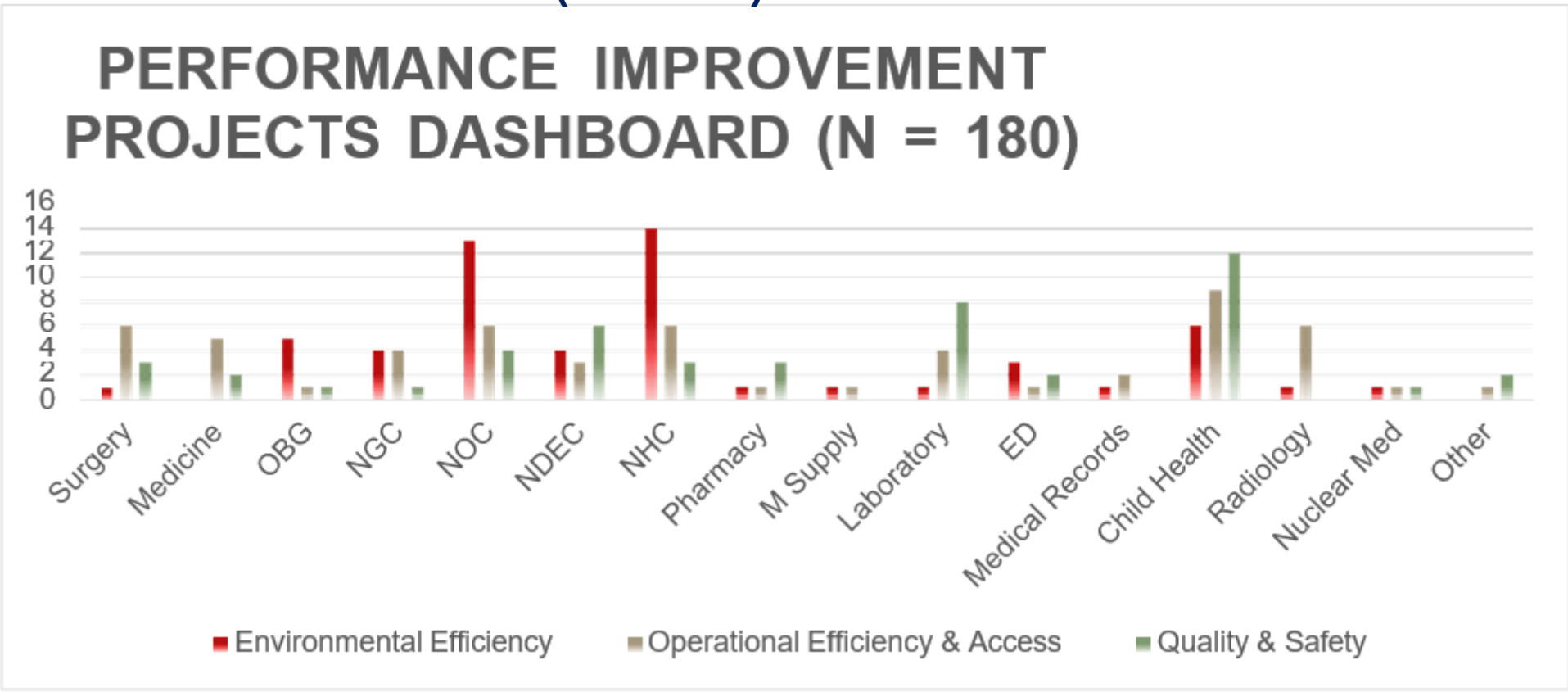
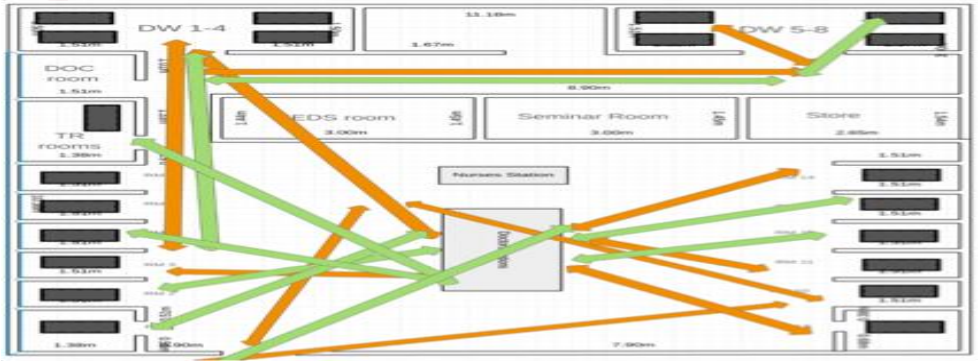
Teamwork Members (n = 287)

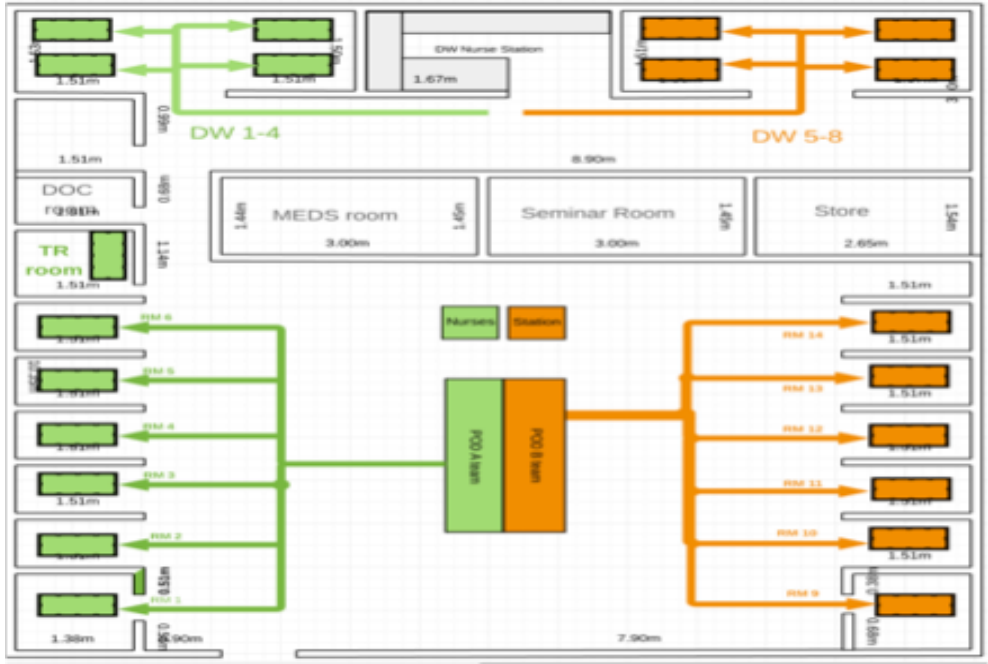



DG
Performance Improvement Unit
Unit leader
Major Hospital Process Improvement Projects
Unit Leader
Lean Champions
30
Lean Workshops Follow up
Unit Facilitator
Directors Bimonthly Meetings
Unit Facilitator
Biweekly Gemba Walks
Unit Facilitator
Champions Bimonthly Meetings
Unit Facilitator
Improving Patient Flow
Champions Leader G1
Improving Inventory Management
Champions Leader G2

Performance Improvement Projects Dashboard (2018/2019)







AER flow performance improvement

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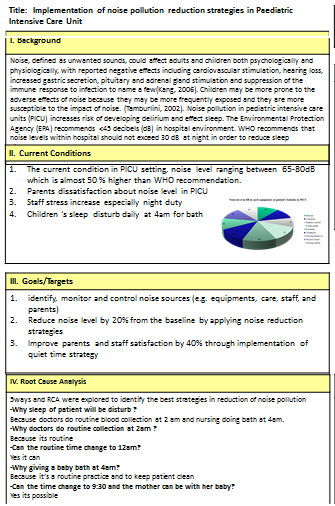
Historical	LEAN
Healthcare professional 1st	**Patient 1st**
Ok to wait	**Waiting**
Add resources	**Work efficiently**
Reduce $$	**Reduce waste**
Function in Silos	**Interdisciplinary**

Lean before Covid


Title: Implementation of noise pollution reduction strategies in Paediatric Intensive Care Unit

I. Background

Noise, defined as unwanted sounds, could affect adults and children both psychologically and physiologically, with reported negative effects including cardiovascular stimulation, hearing loss, increased gastric secretion, pituitary and adrenal gland stimulation and suppression of the immune response to infection to name a few(Kang, 2006). Children may be more prone to the adverse effects of noise because they may be more frequently exposed and they are more susceptible to the impact of noise. (Tamburlini, 2002). Noise pollution in pediatric intensive care units (PICU) increases risk of developing delirium and effect sleep. The Environmental Protection Agency (EPA) recommends ≤43 decibels (dB) in hospital environment. WHO recommends that noise levels within hospital should not exceed 30 dB at night in order to reduce sleep

II. Current Conditions

1. The current condition in PICU setting, noise level ranging between 65-80dB which is almost 50 % higher than WHO recommendation.
2. Parents dissatisfaction about noise level in PICU
3. Staff stress increase especially night duty
4. Children 's sleep disturb daily at 4am for bath

III. Goals/Targets

1. Identify, monitor and control noise sources (e.g. equipments, care, staff, and parents)
2. Reduce noise level by 20% from the baseline by applying noise reduction strategies
3. Improve parents and staff satisfaction by 40% through implementation of quiet time strategy

IV. Root Cause Analysis

Sways and RCA were explored to identify the best strategies in reduction of noise pollution
-Why sleep of patient will be disturb ?
Because doctors do routine blood collection at 2 am and nursing doing bath at 4am.
-Why doctors do routine collection at 2am ?
Because its routine
-Can the routine time change to 12am?
Yes it can
-Why giving a baby bath at 4am?
Because it's a routine practice and to keep patient clean
-Can the time change to 9:30 and the mother can be with her baby?
Yes its possible

Date: 1/12/2018	Revision 1 Date 1/1/2019	Revision 2 Date 1/11/2020	

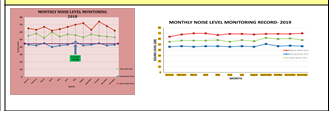
V. Solution

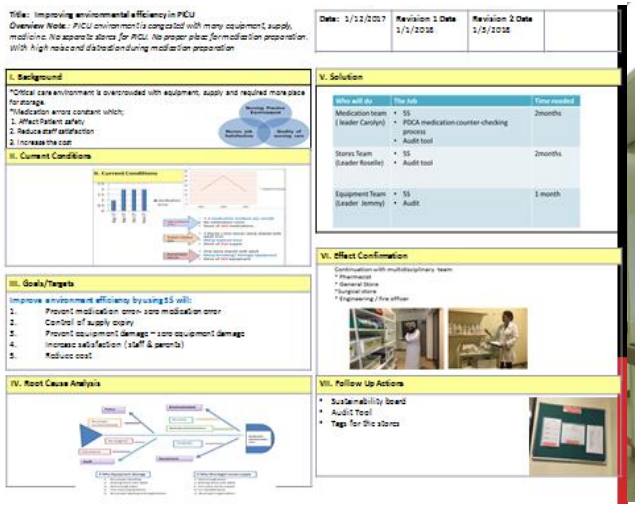
Action	Responsibility	Description	Due	Status/ completed
Forming team	Muna	Multidisceplinary	Dec 2017	
QT protocol	Maria theresa	Including assessment tool	Dec 2017	
Education and reminder system	Safiya & carolyn	Include orientation checklist	Jan 2018	
Audit tool and evaluation	Carolyn & Muna	PDCA	Jan 2018	
Noise meter	Dr. Balqees & Muna	With checklist	Jan 2018	

VI. Effect Confirmation

Assessment tool and audit, monthly include in satisfaction survey and give feedback to staff and parents. Implement quesionnaire for staff

VII. Follow Up Actions




Title: Improving environmental efficiency in PICU

Overview Note: PICU environment is congested with many equipment, supply, medicine. No separate stores for PICU. No proper place for medication preparation. With high noise and distraction during medication preparation

Date: 1/12/2017	Revision 1 Date 1/1/2018	Revision 2 Date 1/1/2018	

I. Background

*Critical care environment is overcrowded with equipment, supply and required more place for storage.
*Medication errors constant which;
1. Affect Patient safety
2. Reduce staff satisfaction
3. Increase the cost

II. Current Conditions

III. Goals/Targets

Improve environment efficiency by using 5 S will:
1. Prevent medication error= zero medication error
2. Control of supply expiry
3. Prevent equipment damage = zero equipment damage
4. Increase satisfaction (staff & parents)
5. Reduce cost

IV. Root Cause Analysis

V. Solution

Who will do	The Job	Time needed
Medication team (leader Carolyn)	• 5S • PDCA medication counter-checking process • Audit tool	2months
Stores Team (Leader Roselle)	• 5S • Audit tool	2months
Equipment Team (Leader Jemmy)	• 5S • Audit	1 month

VI. Effect Confirmation

Continuation with multidisciplinary team
* Pharmacist
* General Store
*Surgical store
* Engineering / Fire officer

VII. Follow Up Actions

- Sustainability board
- Audit Tool
- Tags for the stores

1. Patient flow and reducing LOS VSM

2. Standardization of Inventory managment in the hosptial

3. Improving noise reduction startegies

4. Reduce medication administration errors


NO.
PLEASE
PROCEED TO
ROOM

During Covid crisis
2020

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RH Challenges During Covid

Demand exceed capacity

4 ICU opened within 4 months (from 16 beds to 100 beds)

ICU competency

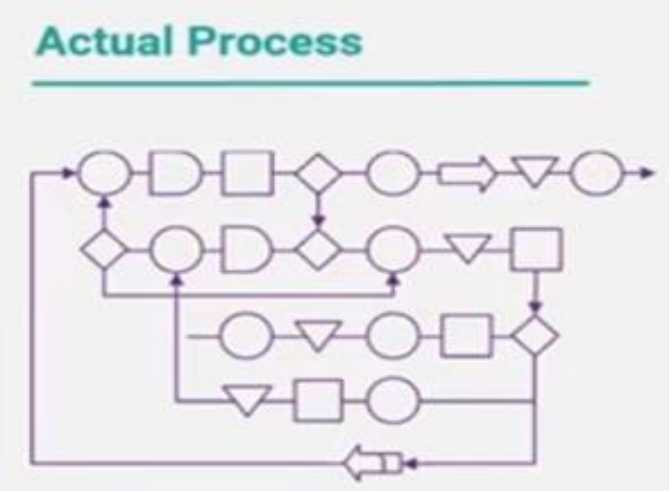
Diluting nursing skill mixed > 100% With non-ICU specialty

8 Waste

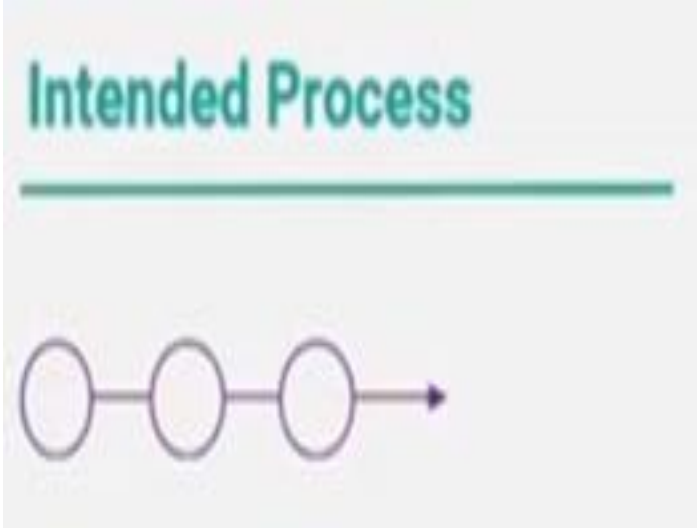
Delay in care/ Procedures as the frontline staff new to ICU

Supply Chain

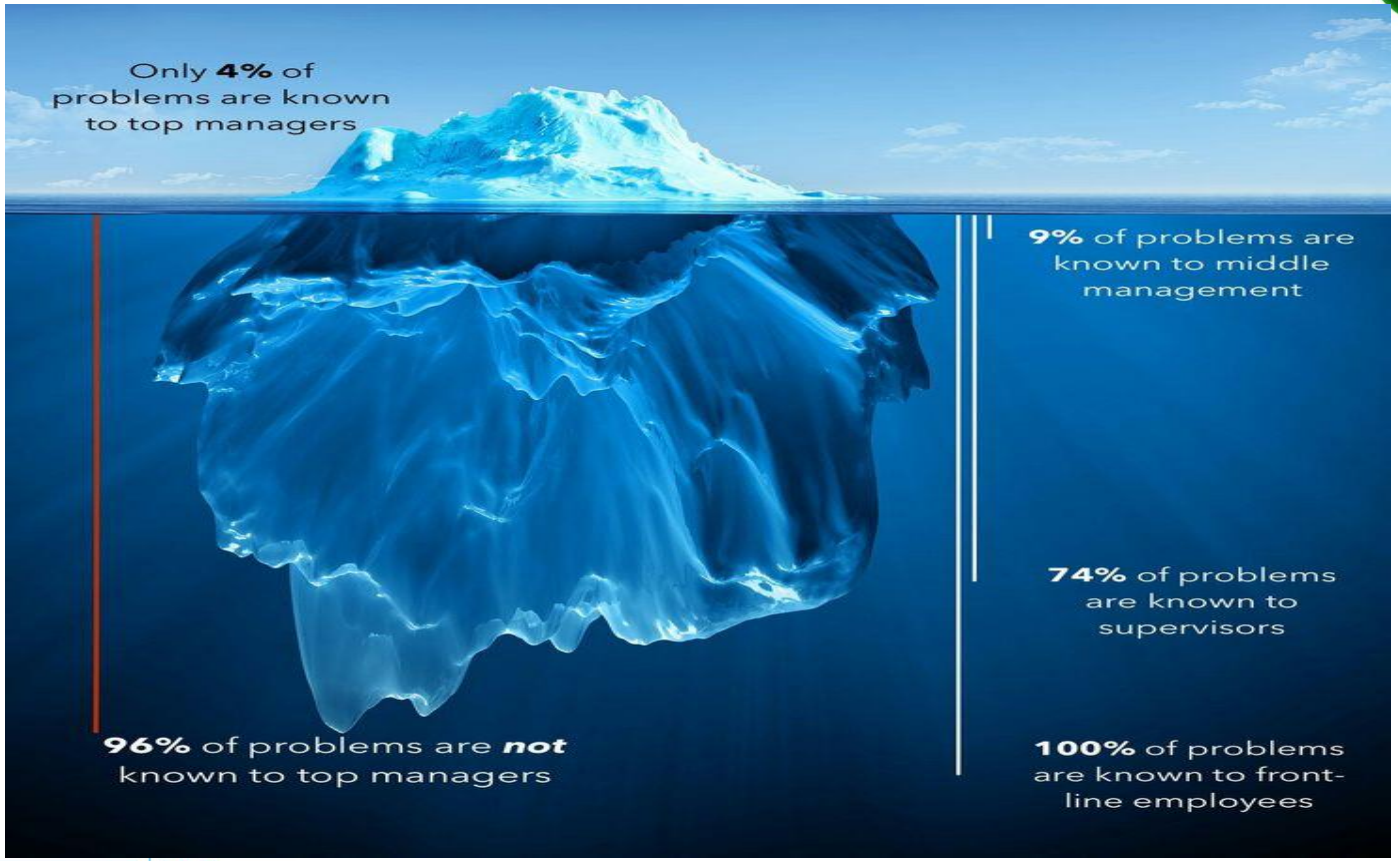
Shortage of resources



Covid19 pandemic
Exhausted staff



Lean thinking


Only 4% of problems are known to top managers
9% of problems are known to middle management
74% of problems are known to supervisors
96% of problems are not known to top managers
100% of problems are known to front-line employees

Journal of Healthcare Management
Wolters Kluwer Health

Managing Through a Pandemic: A Daily Management System for COVID-19 Response and Recovery

Goal: This study explored the use of a Lean daily management system (DMS) for COVID-19 response and recovery in U.S. hospitals and health systems. Originally developed in manufacturing, Lean is an evidence-based approach to quality and process improvement in healthcare. Although Lean has been studied in individual hospital units and outpatient practices, it has not been examined as a whole system response to crisis events.

Methods: We conducted qualitative interviews with 46 executive leaders, clinical leaders, and frontline staff in four hospitals and health systems across the United States. We developed a semistructured interview guide to understand DMS implementation in these care delivery organizations. As interviews took place 6–8 months following the onset of the pandemic, a subset of our interview questions centered on DMS use to meet the demands of COVID-19. Based on a deductive approach to qualitative analysis, we identified clusters of themes that described how DMS facilitated rapid system response to the public health emergency.

Principal Findings: There were many important ways in which U.S. hospitals and health systems leveraged their DMS to address COVID-19 challenges. These included the use of tiered huddles to facilitate rapid communication, the creation of standard work for redeployed staff, and structured problem-solving to prioritize new areas for improvement.

Lean Daily management system (DMS)

- Is designed to support **daily operations**, thus enabling teams to **identify problems** and **implement changes** to work processes.
- Its includes:

1. Regular huddles
2. Standardized work
3. Visual display of performance metrics
4. Plan-do-check-act (PDCA) rapid cycle improvement

DMS can guide and support this at all levels;

1. Executive leadership
2. Senior clinical leadership
3. Middle management
4. Frontline staff

Example of RH- COVID ICU lean initiatives during covid

Distribution of the lean champions during covid crisis

Team	Champion
Covid command	1. Director of nursing (Ms. Nasra) 2. Patient flow and discharge planner (Ms. Yousra) 3. ER (Dr. Saad) 4. Medicine (Dr. Nabil)
Operational	3 lean champions (Ms. Muna, Ms. Jamila, Dr Suad)
Performance management team (Agile team)	3 lean champions (Ms. Jehan, Dr. Nabil, Dr. Harith)
OT utilization team	5 lean champions (Dr. Aamed, Dr. Salim, Dr. Alaa, Dr. Rayya, Ms. Rayya)
Pharmacy team	2 Lean champions (Mr. Faisal, Ms. Umkulthoum)
Supply chain	2 lean champions (Mr. Hamad, Mr. Adnan)
Lean training	4 Lean champions (Dr. Naema, Ms. Zakiya, Dr. Sawsan, Dr. Jamila)
OPD and day care resumption team	3 lean champions (Dr. Iman, Ms. Jehan, Dr. Harith)

BRIEF COMMUNICATION

Oman Medical Journal [2022], Vol. 37, No. 2: e363

Agile Teams and Lean Methods in a Tertiary Care Hospital During COVID-19 Pandemic

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[2]Technical Office, Royal Hospital, Muscat, Oman
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Keywords:
COVID-19; Pandemics; Leadership; Telemedicine; Outpatients; Day care; Hospitals.

ABSTRACT

Objectives: To share the experience of Agile Teams using Lean Method to facilitate improvement projects during the COVID-19 pandemic. ***Methods***: A tertiary hospital in Oman mobilized agile teams using lean methods to streamline the workflow during the early stages of COVID-19 pandemic in year 2020. ***Results:*** The collaborative network generated by the agile teams increased interdepartmental engagement within the hospital and trimmed workflows, thus improving patient care despite the pandemic. ***Conclusions:*** Agile teams using lean methods demonstrably enhance collaboration and efficiency in healthcare, leading to improved patient care.

- **Project 1: Elective service resumption during COVID-19 pandemic**

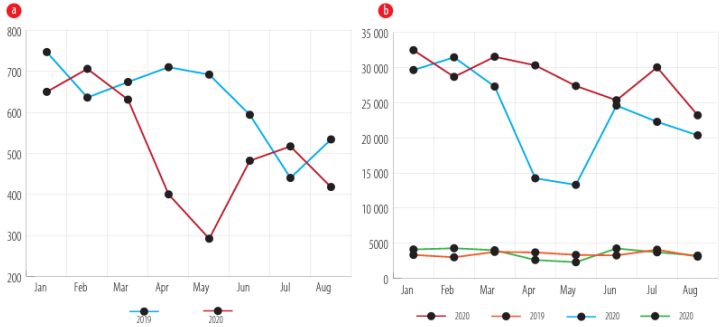

Figure 2: Impact of COVID-19 pandemic on hospital elective services in 2020 compared with 2019. **(a)** Day care and **(b)** outpatient.

- **Project 2: Telemedicine clinics during COVID-19 pandemic**

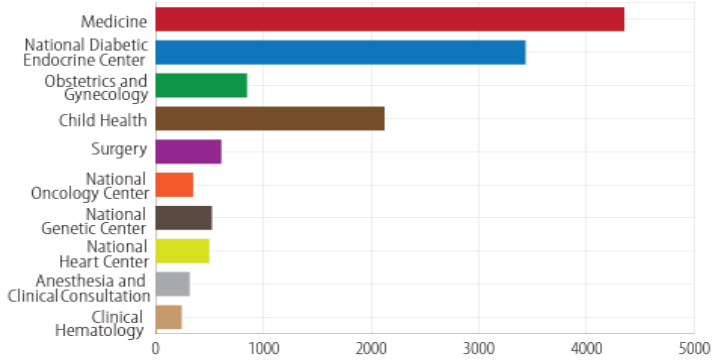

Figure 3: Telemedicine clinic consultation per department during COVID-19 pandemic.

In Critical Care units;

Virtual consultations and follow up by intensivist and specialized nurses at the RH to the regional and secondary hospitals who admit critical patient needs

Design the patient flow

1. **Understand demand and pace** for each patient flow.
2. **Visually map newly-designed flows** and processes to better understand and share with the team.
3. Physically **segregate flows** and ensure that **critical patients have access to dedicated resources**, so that they don't cross paths with other patients.
4. **Separate** those with **respiratory symptoms** from those without.
5. Encourage **"pull"**, by having downstream care providers actively look for their next patients in order to move them to the right place as fast as possible. **Created patient flow manager**

Covid ICUs building

- NHC-Layout of flexibility and appropriates for patient flow.
- Total 4 Covid ICU
- Designed for ICU as infrastructure with capacity 80 beds

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PDCA to redefined nursing and developed alternate staffing models (redistribution of staffing within the organization)

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Streamline processes by elimination of 8 waste & utilization of visual management

*Proper signage (colored for each Covid ICU)

* Reduce motion by creation of RSI trolley , admission trolley & procedure trolleys

Accelerate Training

- Routine training process ideally takes 2-3 months in ICU
- Process reduced to 10 days during covid :

1. Virtual orientation
2. Standard of practice- Laminated guidelines at bedside
3. Simulations
4. Package of videos with QR

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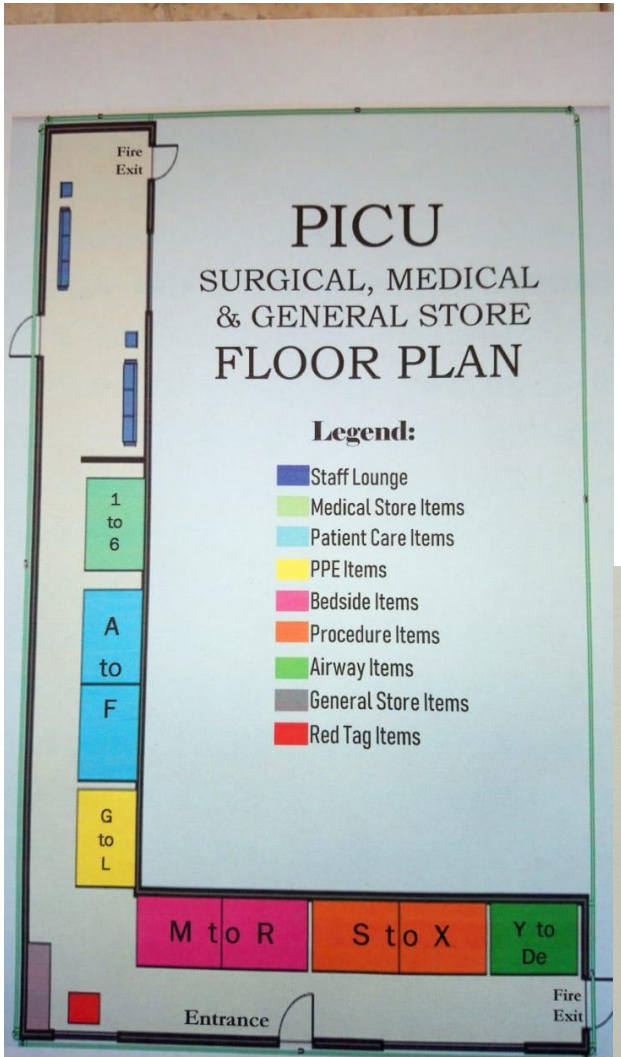
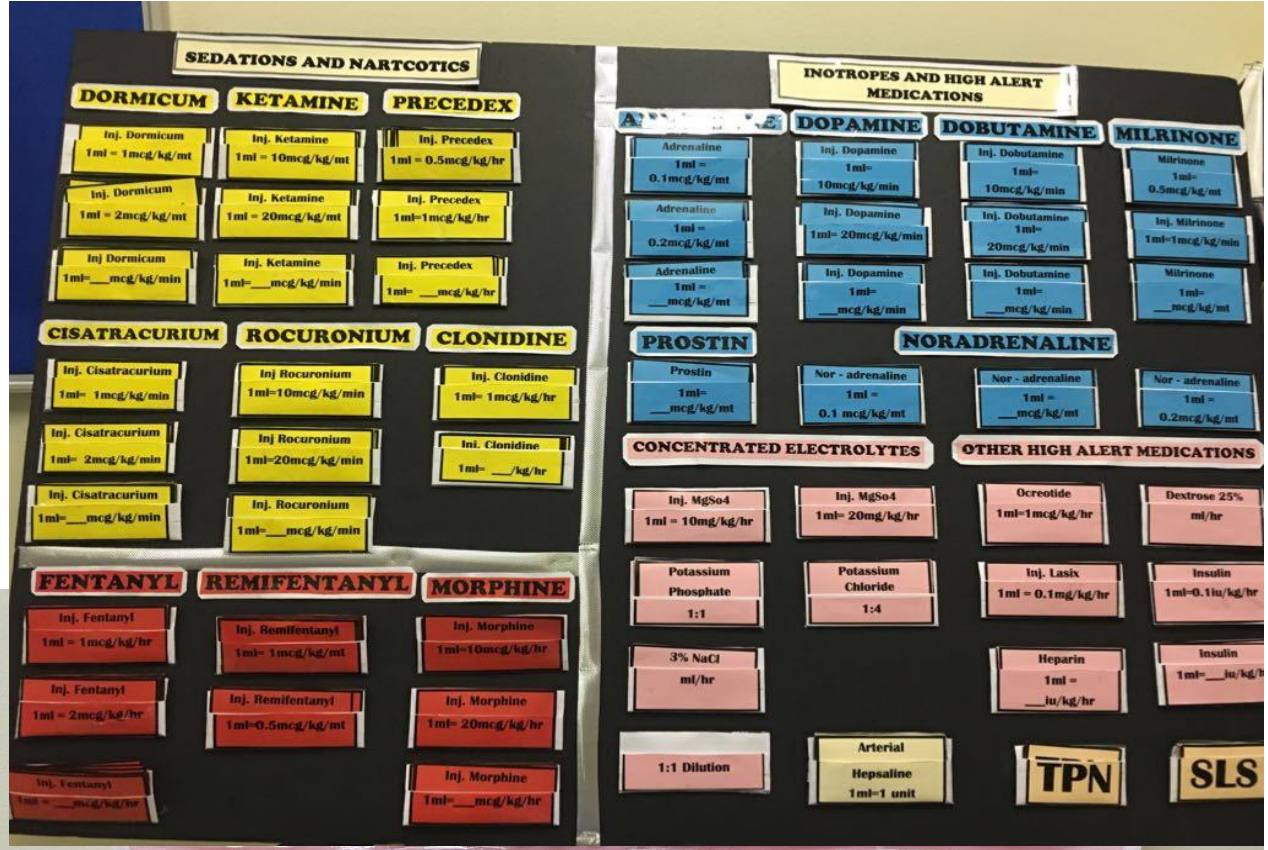
What was the problem ??

How we solve it?

- LCD screen- video about correct steps of donning
- Coding label for covid scabs
- Donning process lead time reduced to 80% (40 min to 10min)
- Efficiency improved by 60% during emergency
- Staff satisfaction

- 5S
- Inventory management system
- Visual management
- Kanban


Fire Exit
PICU
SURGICAL, MEDICAL & GENERAL STORE
FLOOR PLAN
Legend:
Staff Lounge
Medical Store Items
Patient Care Items
PPE Items
Bedside Items
Procedure Items
Airway Items
General Store Items
Red Tag Items
1 to 6
A to F
G to L
M to R
S to X
Y to De
Entrance
Fire Exit


SEDATIONS AND NARTCOTICS
DORMICUM
KETAMINE
PRECEDEX
Inj. Dormicum 1ml = 1mcg/kg/mt
Inj. Ketamine 1ml = 10mcg/kg/mt
Inj. Precedex 1ml = 0.5mcg/kg/hr
Inj. Dormicum 1ml = 2mcg/kg/mt
Inj. Ketamine 1ml = 20mcg/kg/mt
Inj. Precedex 1ml=1mcg/kg/hr
Inj Dormicum 1ml=___mcg/kg/min
Inj. Ketamine 1ml=___mcg/kg/min
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CISATRACURIUM
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CLONIDINE
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Inj. Clonidine 1ml= 1mcg/kg/hr
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FENTANYL
REMIFENTANYL
MORPHINE
Inj. Fentanyl 1ml = 1mcg/kg/hr
Inj. Remifentanyl 1ml= 1mcg/kg/mt
Inj. Morphine 1ml=10mcg/kg/hr
Inj. Fentanyl 1ml = 2mcg/kg/hr
Inj. Remifentanyl 1ml=0.5mcg/kg/mt
Inj. Morphine 1ml= 20mcg/kg/hr
Inj. Morphine 1ml=___mcg/kg/hr
INOTROPES AND HIGH ALERT MEDICATIONS
DOPAMINE
DOBUTAMINE
MILRINONE
Adrenaline 1ml = 0.1mcg/kg/mt
Inj. Dopamine 1ml= 10mcg/kg/min
Inj. Dobutamine 1ml= 10mcg/kg/min
Milrinone 1ml= 0.5mcg/kg/mt
Adrenaline 1ml = 0.2mcg/kg/mt
Inj. Dopamine 1ml= 20mcg/kg/min
Inj. Dobutamine 1ml= 20mcg/kg/min
Inj. Milrinone 1ml=1mcg/kg/min
Adrenaline 1ml = ___mcg/kg/mt
Inj. Dopamine 1ml= ___mcg/kg/min
Inj. Dobutamine 1ml= ___mcg/kg/min
Milrinone 1ml= ___mcg/kg/mt
PROSTIN
NORADRENALINE
Prostin 1ml= ___mcg/kg/mt
Nor - adrenaline 1ml = 0.1 mcg/kg/mt
Nor - adrenaline 1ml = ___mcg/kg/mt
Nor - adrenaline 1ml = 0.2mcg/kg/mt
CONCENTRATED ELECTROLYTES
OTHER HIGH ALERT MEDICATIONS
Inj. MgSo4 1ml = 10mg/kg/hr
Inj. MgSo4 1ml= 20mg/kg/hr
Ocreotide 1ml=1mcg/kg/hr
Dextrose 25% ml/hr
Potassium Phosphate 1:1
Potassium Chloride 1:4
Inj. Lasix 1ml = 0.1mg/kg/hr
Insulin 1ml=0.1iu/kg/hr
3% NaCl ml/hr
Heparin 1ml = ___iu/kg/hr
Insulin 1ml=___iu/kg/h
1:1 Dilution
Arterial Hepsaline 1ml=1 unit
TPN
SLS


LESS stock
FULL stock
OUT of stock
ZERO stock

PICU-NURSING 5S COMMUNICATION BOARD

Area: SURGICAL & EQUIPMENT STORE **Review Date:** NOVEMBER 2021 **Next Review Date:** FEBRUARY 2022

Our Team

DR. SAID
SSN MUNA
ROSELLE
RUBY
ARWA
CHANDRA
JHILLA

Audit Criteria

5S
ROUTINE
AUDIT
TOOL

Previous Score

2.64 (2020)

Latest Score

4.2 (2021)

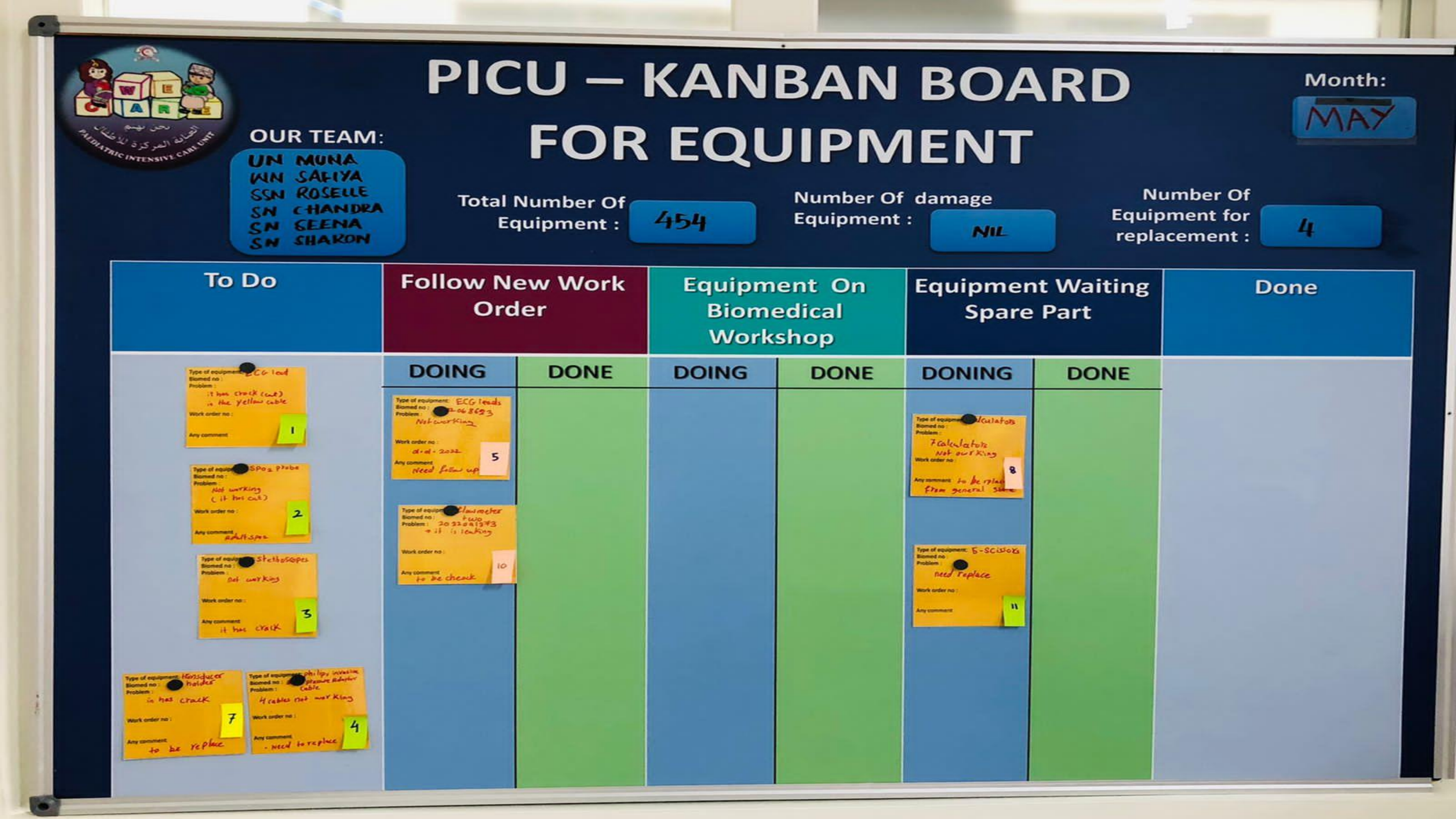
SORT	SET IN ORDER	SHINE	STANDARDIZE	SUSTAIN
very good	very good	very good	very good	very good
good	good	good	good	good
fair	fair	fair	fair	fair
poor	poor	poor	poor	poor

Areas for Improvement

1. TRAINING
2. MOTIVATION
3. SUSTAINABILITY

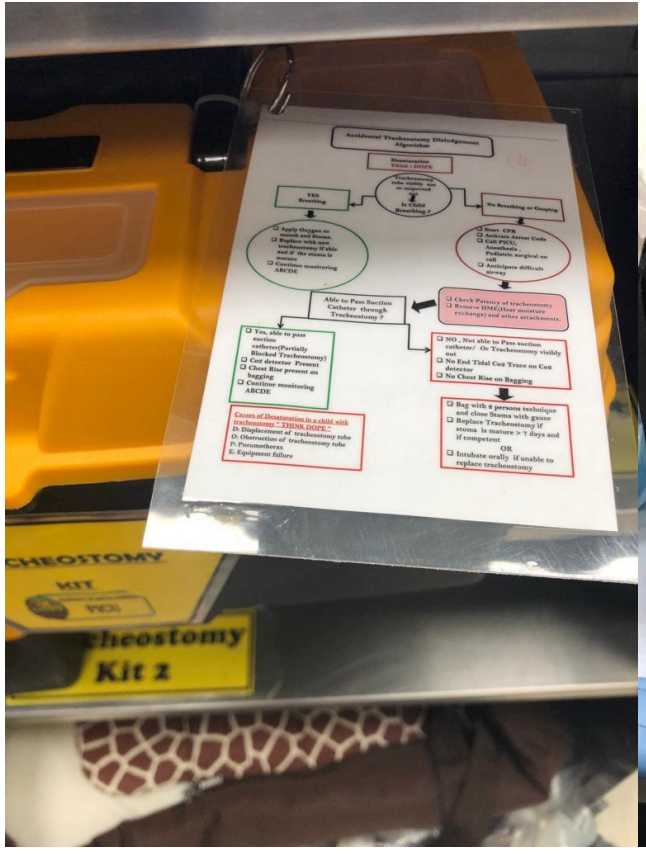
No.	PLAN: Task / Test	PLAN: Expected Result	DO: Action to Take	DO: By Whom	DO: When (date)	DO: % Done	CHECK: Have the expected result /score heen met?	ACT: Lessons learned Continuous Improvement
1	Staff Training	60% of Nurses trained	• Online webinar on 5S • Reminder System • Awareness Campaign	Roselle	Dec. 2021		yes ✓ / no	
2	Inventory Management [surgical Store]	- ↓ shortage of items - ↓ urgent indent - zero expired items	• Proper inventory • Strict compliance to FI. Ship (consumption)	Jhilla Arwa	Dec. 2021		yes / no ✓	SUSTAINABILITY
	Inventory Management [Equipment]	Updated inventory list of all equipment in PICU	Get actual inventory of equipment in PICU	Chandra	Dec. 2021		yes / no ✓	
3	5S Audit every Quarter	Acceptable audit results	• Monitor Audit result • Give Feedback • Formulation plan based on results	Ruby	Dec. 2021		yes ✓ / no	
4	Gemba Rounds	Sustainability	• PICU team round • Meeting	Dr. Said Muna			yes ✓ / no	
5	Motivation	- Cooperation - Teamwork	• Communication • Recognition	Muna	Jan. 2022		yes / no ✓	ENFORCE STAFF MOTIVATION & RECOGNITION

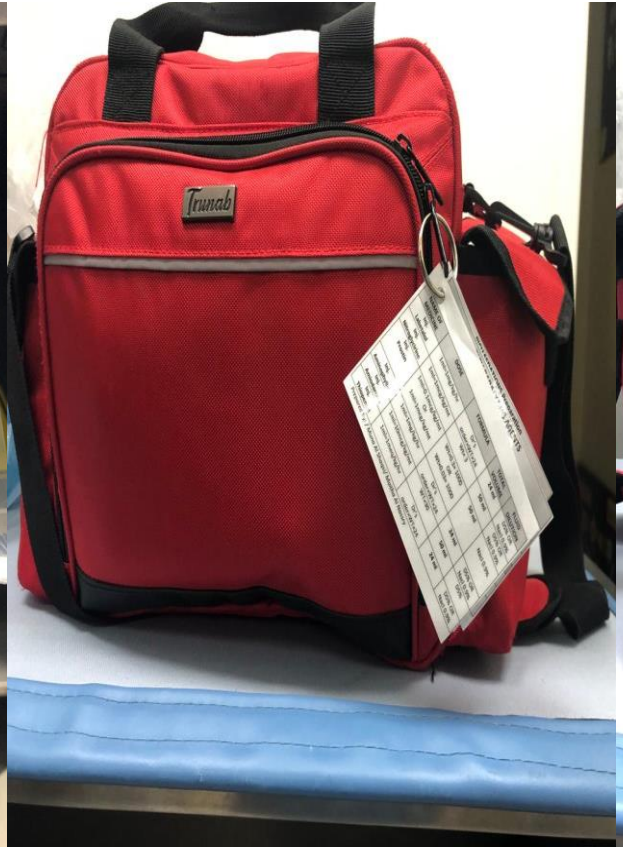
Prepared by PICU nurses 2021

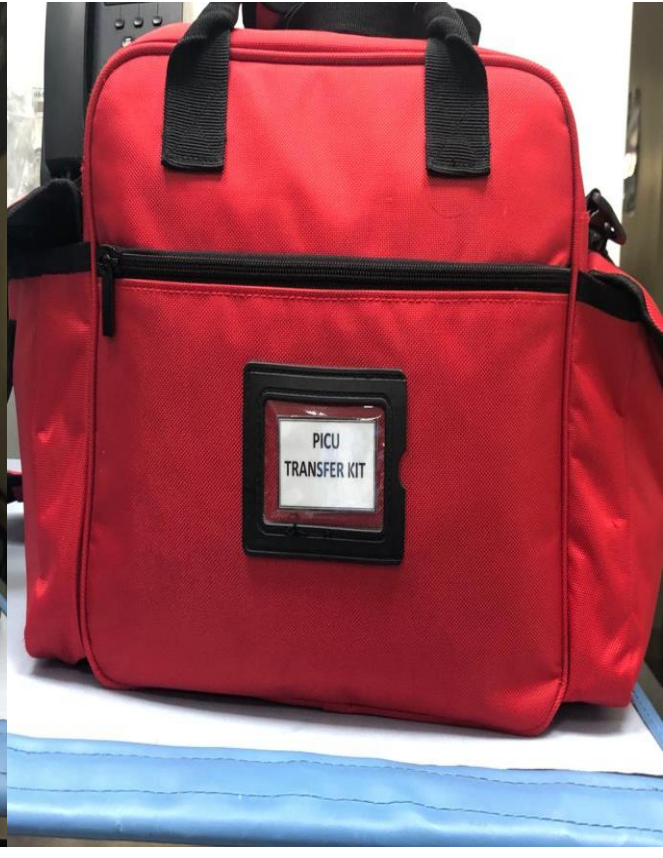

PICU – KANBAN BOARD
FOR EQUIPMENT
Month:
MAY
OUR TEAM:
UN MUNA
WN SAFIYA
SSN ROSELLE
SN CHANDRA
SN SEENA
SN SHARON
Total Number Of Equipment :
454
Number Of damage Equipment :
NIL
Number Of Equipment for replacement :
4
To Do
Follow New Work Order
Equipment On Biomedical Workshop
Equipment Waiting Spare Part
Done
DOING
DONE
DOING
DONE
DONING
DONE

Sterilization of N95 to 5 days

Kits


Accidental Tracheostomy Dislodgement Algorithm
Desaturation
Think - DOPE
Tracheostomy tube visibly out or displaced
Is Child Breathing ?
YES Breathing
No Breathing or Gasping
Apply Oxygen to mouth and Stoma
Replace with new tracheostomy if skin and if the stoma is mature
Continue monitoring ABCDE
Start CPR
Activate Arrest Code
Call PICU,
Anesthesia , Paediatric surgical on call
Anticipate difficult airway
Able to Pass Suction Catheter through Tracheostomy ?
Check Patency of tracheostomy
Remove HME(Heat moisture exchange) and other attachments
Yes, able to pass suction catheter(Partially Blocked Tracheostomy)
Cot detector Present
Chest Rise present on bagging
Continue monitoring ABCDE
NO , Not able to Pass suction catheter/ Or Tracheostomy visibly out
No End Tidal Co2 Trace on Cot detector
No Chest Rise on Bagging
Causes of Desaturation in a child with tracheostomy " THINK DOPE "
D: Displacement of tracheostomy tube
O: Obstruction of tracheostomy tube
P: Pneumothorax
E: Equipment failure
Bag with 4 persons technique and close Stoma with gauze
Replace Tracheostomy if stoma is mature > 7 days and if competent
OR
Intubate orally if unable to replace tracheostomy
CHEOSTOMY
KIT
PICU
heostomy
Kit 2


Trunab


PICU
TRANSFER KIT

Achievement after implementation 5S and visual management tool

Safety

*Zero administration medication error

* Improved medication counter-checking by 85%

*No Equipment damage

Efficiency

* Speed preparation of medication by 95%

*Reduced time in search by 80%

* Improved equipment audit and consumption items by 90%

Patient centeredness

*Reduction delay in procedure by 70%

* Patient & family satisfaction improved 80% and staff satisfaction were enhanced to 90%

Cost

Cost reduction of 5000Rial per month

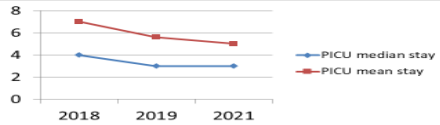
Title: Improving Patient Flow in the pediatric ICU

Revision 1: 2018 Revision 2: December/1st 2021 Revision 3: April/2022

Problem's statement. PICU unit is constantly under **demand** for admissions from within RH and other hospitals. There is increase to admit to PICU during busy times of the year including emergency cases, elective surgical cases and elective cases needing assessment from outside the hospital.

11.Current condition

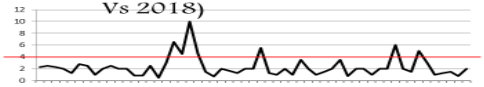
1.Reduce overall PICU stay →



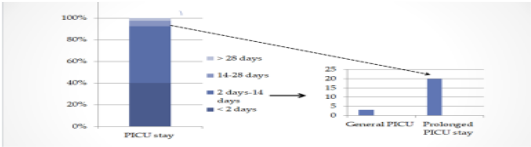
2..Reduce time to admit sick patients

← VSM of patient Flow showed reduction in time to receive patients in PICU by 50%(2020 Vs 2018)

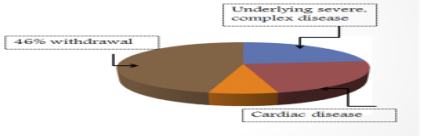
Median time from PICU review(ED cases) to PICU admissions (2 hours) months July–end of October/21 →



3.Patients with complex medical background stay longer and develop medical co–morbidities like withdrawal



Median stay in PICU is longer for complex patients



Causes for prolonged stay in complex patients

111..Goals/Targets

1..Reduce lead time to transfer out patients by 10% to have beds ready for emergency cases
2.Improve quality of chronic patients by controlling withdrawal, nutrition and improve early mobilization

1V. Root Cause Analysis (5 whys)

Delay in shifting out patients ready for transfer outside of PICU
1. Non– availability of beds in Medical HD and pediatric wards to receive patients ready for transfer from PICU
2.Need to admit patients other than PICU patients (from ER, elective cases etc)
Chronic complex patients has longer stay in PICU
1.Delay in performance of certain procedures such as ENT assessment
2.No delegated days for PICU procedures like ENT
3..Development of other medical co–morbidities during long stay like withdrawal

V. Solutions

Improve Admission Process			
1. Safety huddle daily to accelerate management and decide transfers	PICU team	Review every 6 months	
2.Weekly discussion (Sunday) for complex patients and those staying > 7 days	PICU team	Review every 3–6 months	
3.Allocate beds for surgical and elective cases (one bed for surgical cases /week and one bed for elective procedure /week)	Dr. Said/ SN.Muna	Review every 3 months	
4. . Prepare one bed with neonatal set up and one with pediatric set up	PICU nursing	Review every 6 months	
5.Audit admission process prospectively	SN . Muna	Review every 3 months	

Improve Patient's management Process(reduce ICU stay and improve bed utilization)			
1.Improve care and reduce hospital stay for patients needing chronic respiratory support(tracheostomy and home ventilation)	Home ventilation team Dr.Akram /SN. Asmaa Dr. Saif	Review every 6 months	Complete
2. Expansion of use of medical HD for NIV and HFNC to reduce need to admit patients needing respiratory support	Dr. Said and Dr. Kholoud	Review every 6 months	Complete
1.Reduce incidence of withdrawal and implement effective treatment	Dr. Akram Dr. Ahmed Al Zaidi	Review every 3 months	In progress
2.Early mobilization	SN. Myithaa/ Dr. Balqees	Review every 3 months	In progress
3.Improve nutrition for PICU patients	Dr.Farhana / SN.Myithaa	Review every 3 months	In progress
4. Improve recognition and management of delirium	Dr.Farhana /nursing	Review every 3 months	In progress

V. Effect Confirmation

1.PDCA to audit patient's flow from admission to discharge during current overflow in the pediatric department

2. Follow up on PICU 's quality projects(nutrition, management of withdrawal , early mobilization etc) with KPI

1

Admission Process VSM

UNPLANNED
WARD / E.R

PLANNED
PROCEDURE/SURGICAL/
OTHER HOSPITAL/CARDIAC

REFERRAL — 2 mins
15 mins
PATIENT ASSESSMENT AND MANAGEMENT — 120 mins
2 mins
ICU CONSULTANT DECISION
ACCEPTED — 7 days
NOT ACCEPTED
1 min
CALLING FOR ADMISSION — 2 mins
3 mins
BED ALLOCATION
BED AVAILABLE — 30 mins
BED NOT AVAILABLE — 240 mins
CALL BED READY — 1 mins
45 mins
PATIENT ARRIVE TO PICU — 5 mins
20 mins
PATIENT OFFICIALLY ADMITTED — 2 mins

LEAD TIME
BED AVAILABLE: 250 MINS
NO BED: 490 MINS

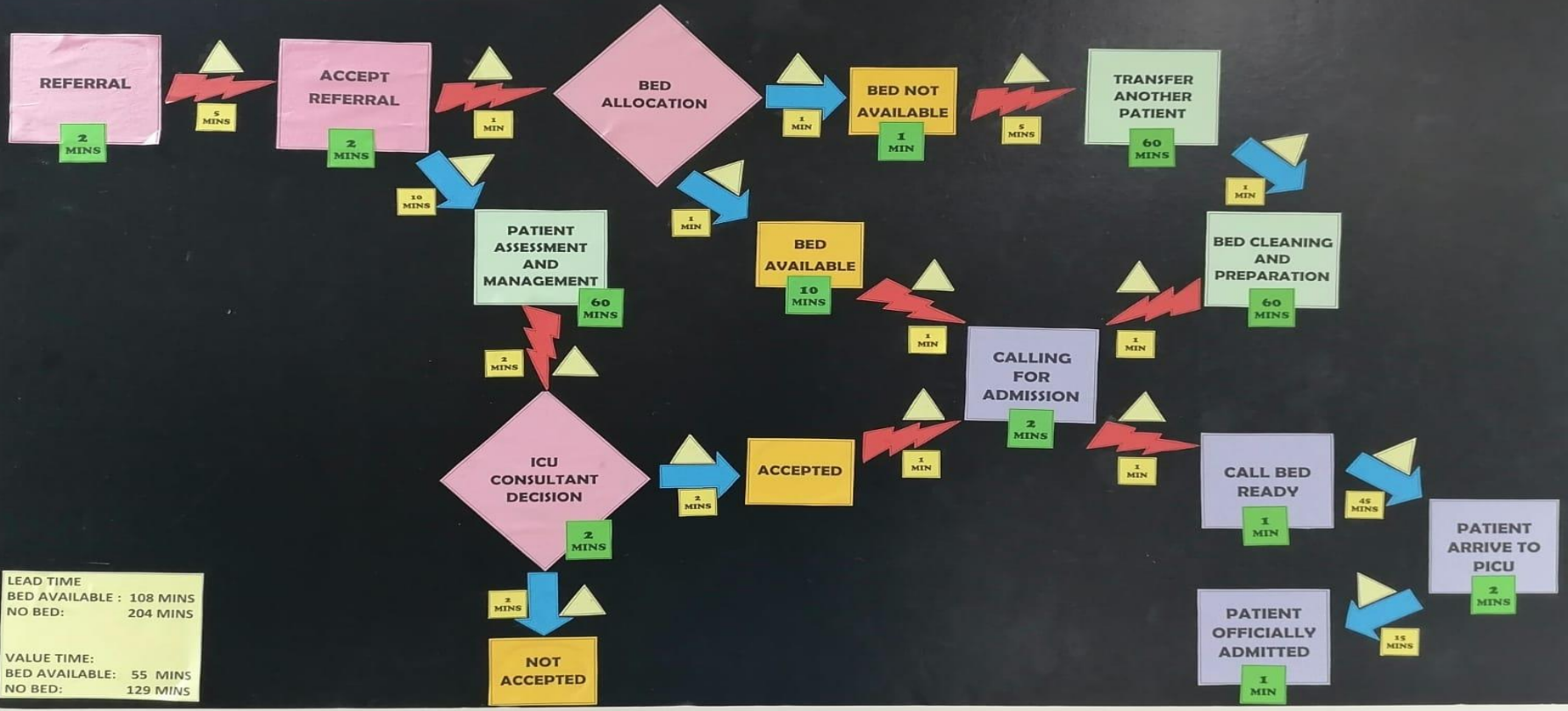
VALUE TIME: 134 MINS
WASTE TIME:
BED AVAILABLE : 106 MINS
NO BED: 356 MINS

2

Admission Process VSM

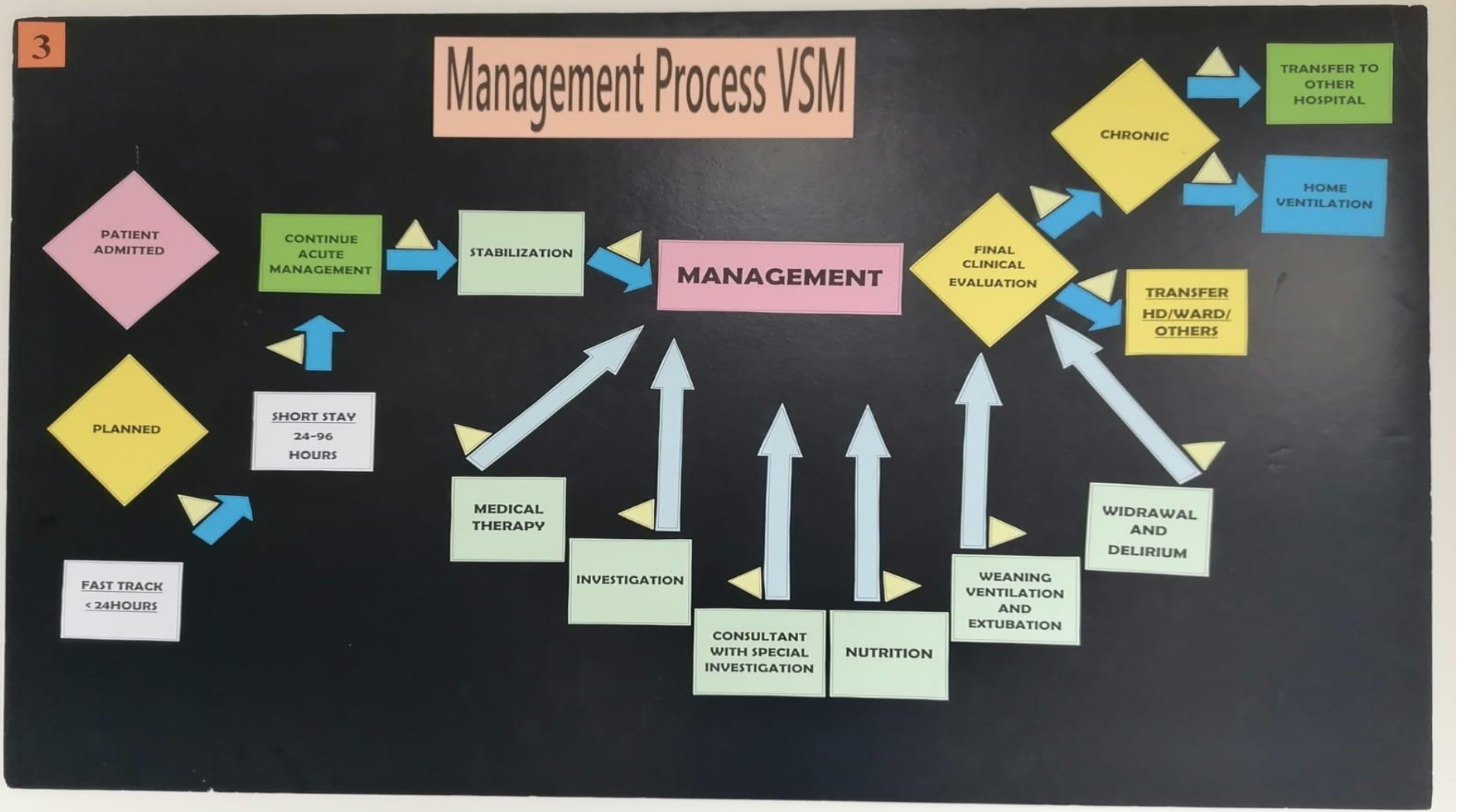
PLANNED
PROCEDURE/SURGICAL/
OTHER HOSPITAL/CARDIAC

UNPLANNED
WARD / E.R



LEAD TIME
BED AVAILABLE : 108 MINS
NO BED: 204 MINS

VALUE TIME:
BED AVAILABLE: 55 MINS
NO BED: 129 MINS


3
Management Process VSM
PATIENT ADMITTED
PLANNED
FAST TRACK < 24HOURS
CONTINUE ACUTE MANAGEMENT
SHORT STAY 24-96 HOURS
STABILIZATION
MANAGEMENT
MEDICAL THERAPY
INVESTIGATION
CONSULTANT WITH SPECIAL INVESTIGATION
NUTRITION
WEANING VENTILATION AND EXTUBATION
WIDRAWAL AND DELIRIUM
FINAL CLINICAL EVALUATION
CHRONIC
TRANSFER TO OTHER HOSPITAL
HOME VENTILATION
TRANSFER HD/WARD/ OTHERS

YOUR PATHWAY TO HOME

Tracheostomy

Care giver teaching guideline

COMPETNET | NOT COMPETNET

Observation 1

Theory Explanation 2

Home Preparation 3

- Home Ventilator
- Suctioning machine
- O2 concentrator
- O2 cylinder
- Pulse oximetry
- Ambu bag
- Humidifier
- Feeding pump

Requested / Available

Infection Control

Hand hygiene

Routine Care 5

- Suctioning
- Tie change
- Tracheostomy care
- Ambu bagging
- 1st tracheostomy change

NOTICE — Hand Washing Station

Feeding 6

- NGT feeding
- NGT insertion
- Gastrostomy feeding

Emergency 7

- Emergency Bag
- BLS and Emergency Situation
- Care giver change tracheostomy

Mobilization 8

- Early mobilization
- Physiotherapy

Letter 9

- Electricity Letter
- Caregiver Letter
- To who it concern letter
- Equipment letter

Indent Request Items for Discharge 10

- Send to surgical store
- Received
- Given to the parent

Referral 11

- Health center
- Polyclinic
- Other hospital
- Community Nurse
- Immunization

Day Care Appointment 12

Schedule your Appointment

Pediatric HIGH DEPENDENCY UNIT

طريقك للمنزل

أنبوب التنفس العنقي

إرشادات تعليمية لمقدم الرعاية

غير مقتدر | مقتدر

المراقبة و الملاحظة 1

الشرح النظري 2

إستعدادات الذهاب الى المنزل 3

- جهاز مساعد للتنفس
- جهاز شفط البلغم
- O2 concentrator
- أسطوانة الأكسجين
- جهاز قياس نبض و مستوى الاكسجين
- Ambu bag
- Feeding pump

الوقاية من العدوى و البكتيريا

تعقيم اليدين

العناية اليومية 5

- شفط البلغم
- تغيير بطة العنق
- العناية بالأنبوب التنفس العنقي
- Ambu bagging
- أول تغيير لربطة العنق

NOTICE — Hand Washing Station

علاج النطق 6

- جهاز مساعد للتنفس
- Alarm setting
- جهاز قياس مستوى الاكجين
- جهاز الشفط

التدريب على الأجهزة 7

التغذية 8

- إعطاء الحليب عن طريق انبوب التغذية
- ادخال أنبوب التغذية
- إعطاءالحليب عن طريق أنبوب التغذية المعوي

الحالات الطارئة 9

- حقيبة الطوارئ
- الإنعاش الرئوي و الحالات الطارئة
- تغيير أنبوب التنفس العنقي

الحركة 10

- الحركة المبكرة
- علاج طبيعي

الرسائل 11

طلب المعدات و الادوات للمنزل 12

تحويل 13

- مركز صحي
- مجمع صحي
- مستشفيات أخرى
- ممرضة المجتمع
- تطعيم

موعد في العيادة اليومية 14

Schedule your Appointment

العناية المتوسطة للأطفال

Title: Implementation of 5S Inventory Management System in All inpatient and outpatients stores in the Royal hospital

Date: 1/1/2019	Revision 1 Date 1/06/2019	Revision 2 Date 1/03/2020	Revision 3 Date 20/3/2021

I. Background

All endusers face challenges in non- availability of items, delay in searching time, and expiry items either in lab, surgical, and medical stores
These will affect;

- Patient's safety and quality of care
- Patient and staff satisfaction
- Delay in procedures initiation

II. Current Conditions

1. Shortage of items affect patient care as it lead to delay in procedure or cancelation

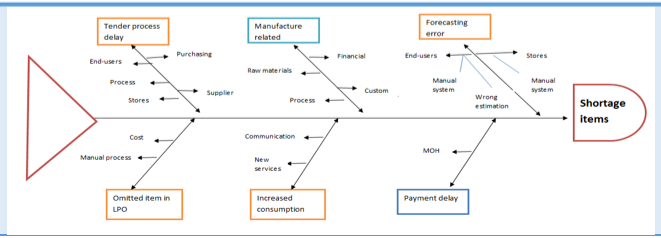
e.g. 20% procedures were cancelled

1. In lab items, many expired items due to overstocking
2. Average search time in each ward surgical store > 4 to 5 mins which leads to delays in providing patient care.
3. In Critical Care Unit, approximately OMR 27,000 monthly indent in 2019

III. Goals/Targets

1. Reduce shortage of item will be based on the valid statistic
2. Reduce number of unnecessary LPR
3. Standardization of all RH mini-stores (5S, documentation, proper consumption, proper ordering) by end of May 2021
4. Sustain all standardized stores
5. Improve communication system (electronic system)

IV. Root Cause Analysis

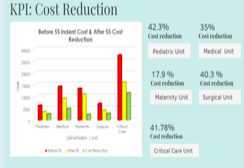


V. Solution

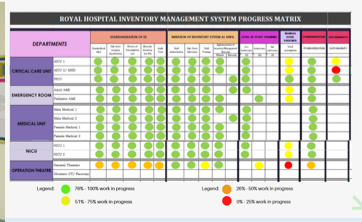
Action	Responsibility	Description	Due	Status/ completed
Formulating inventory team and identifying KPI	Muna	Collect needs analysis for all end-users	Jan 2019	
Training all focal points with providing mentorship by IT and nursing	Inventory team and IT (Abubaker)	Including checklist tool	March 2019	
Creating Sub-stores in each wards and implementing barcode tools	IT / Roselle	Include manual for not available barcode and pilot iPad in picu store	Jun 2019	
Standardize all stores with color coded items and subitems	Focal points	Kanban system	Oct 2019	
Scheduled Gemba walk to all sub-stores with structured assessment tools	Inventory team	With checklist and the winner department will be acknowledged	Dec 2019	
Random Gemba for the sustainability	Inventory team	With assessment checklist and identifying the best department to be role model first winner	Feb 2019	

VI. Effect Confirmation

Assessment tool and audit, monthly include in satisfaction survey and give feedback to staff and listen to their challenges through Gemba walk



VII. Follow Up Actions

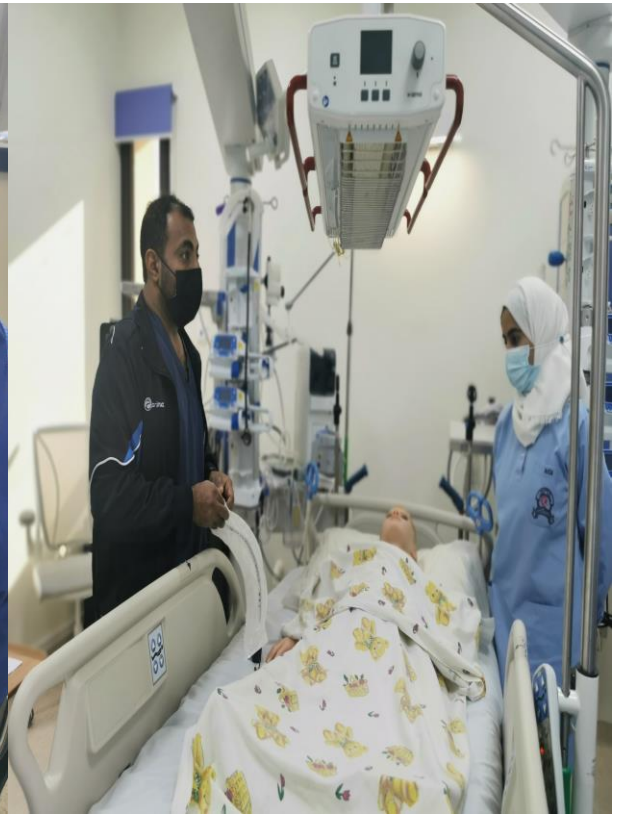


Safety Huddle

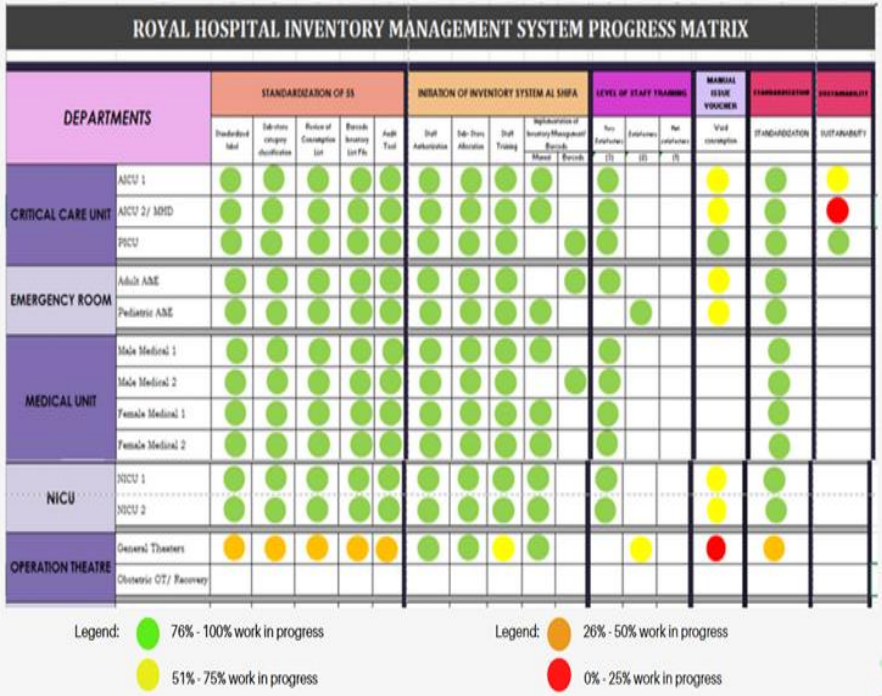
Virtual video call to parents


CERAMOTHERM
STANDBY

Training and simulation after covid



GEMBA Walk for sustaining



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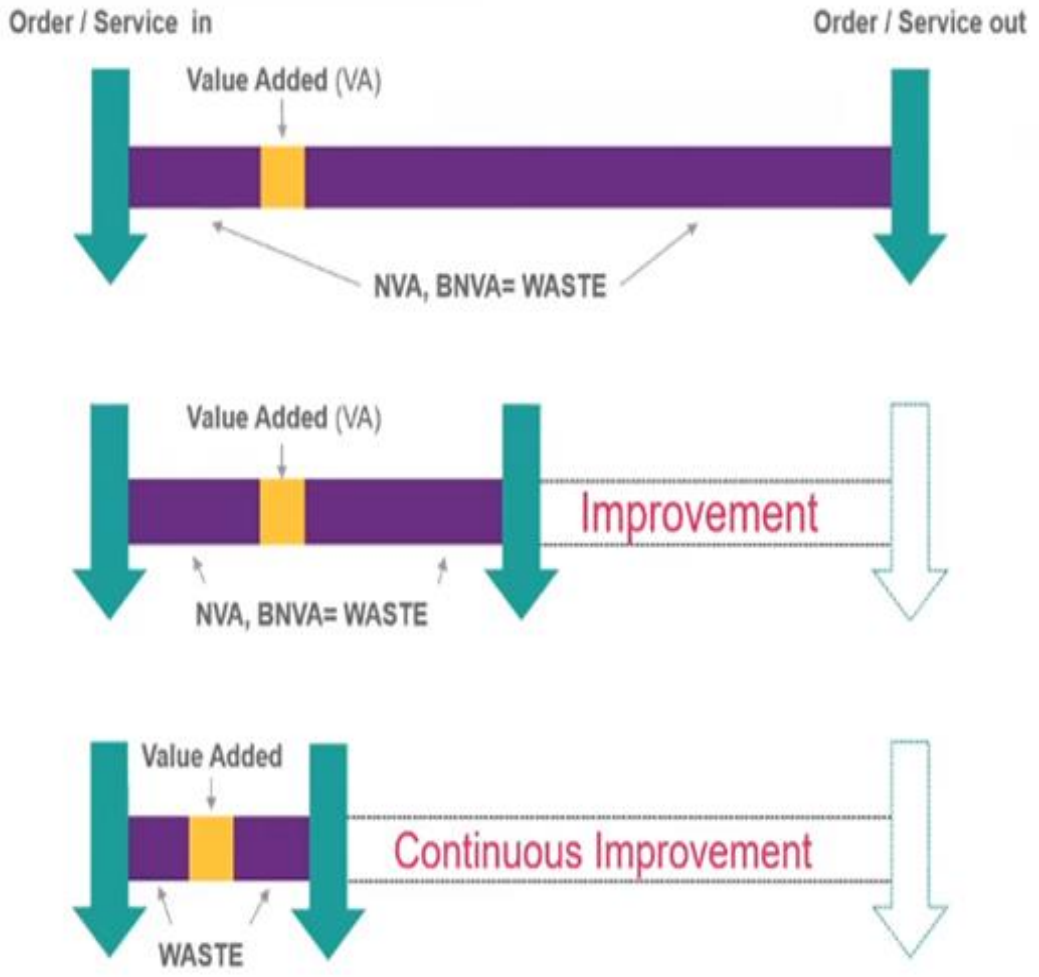
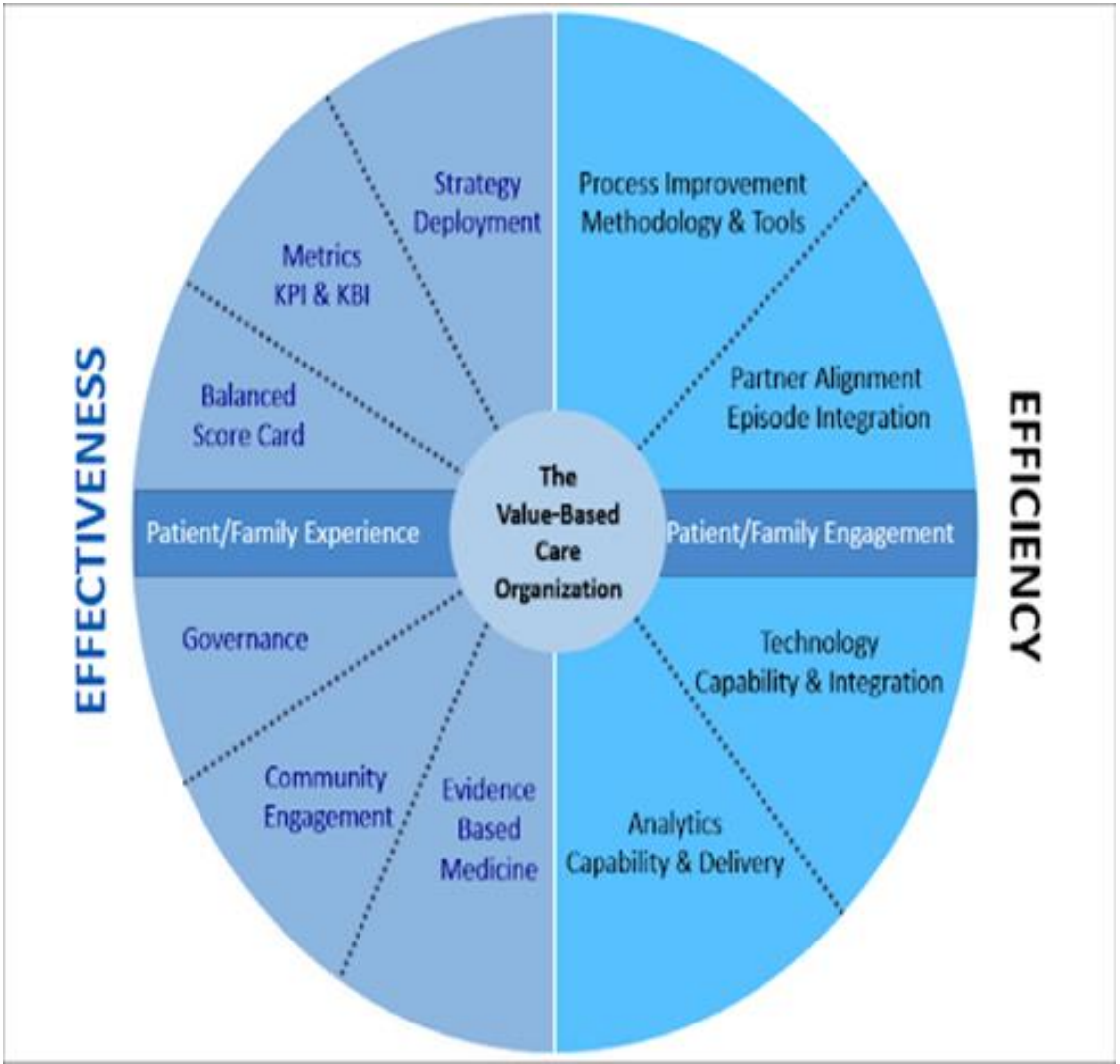
Future Recommendation

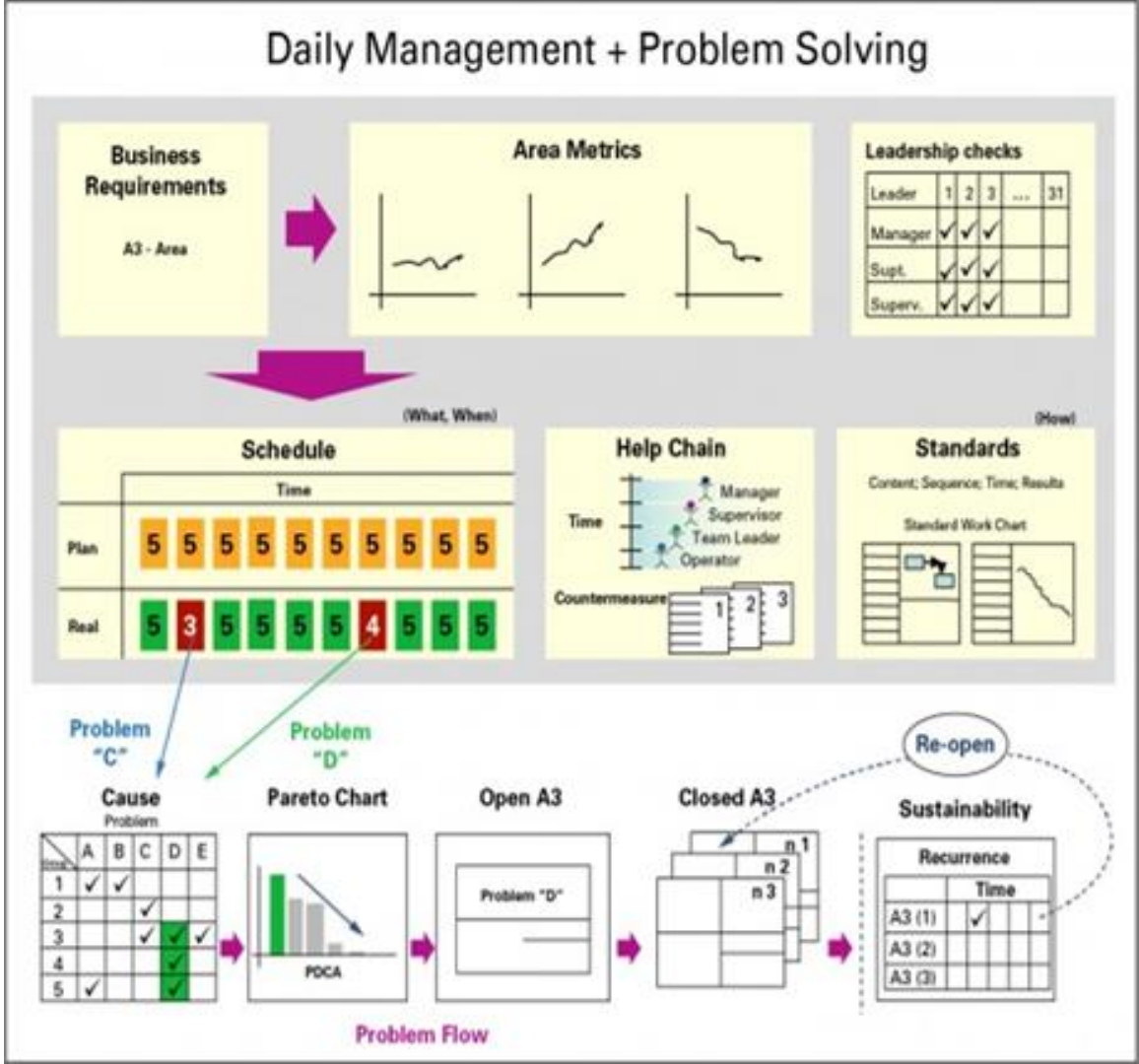
1. Coordination & communication with multidisciplinary Team



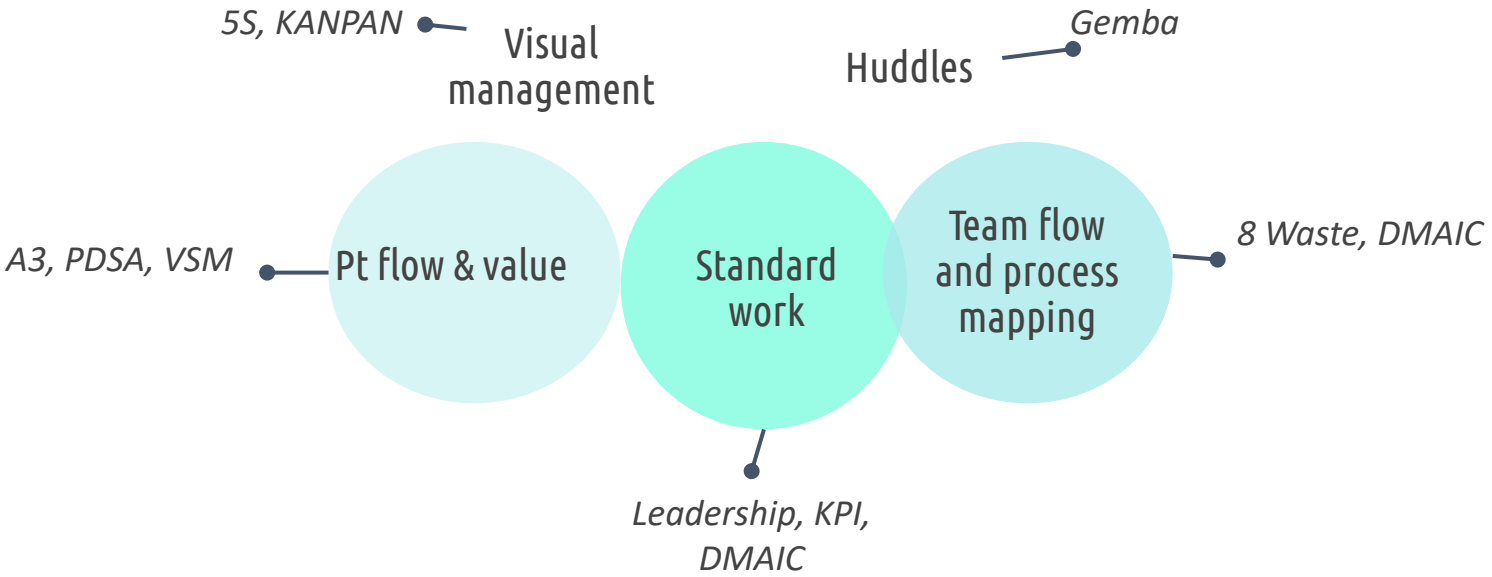


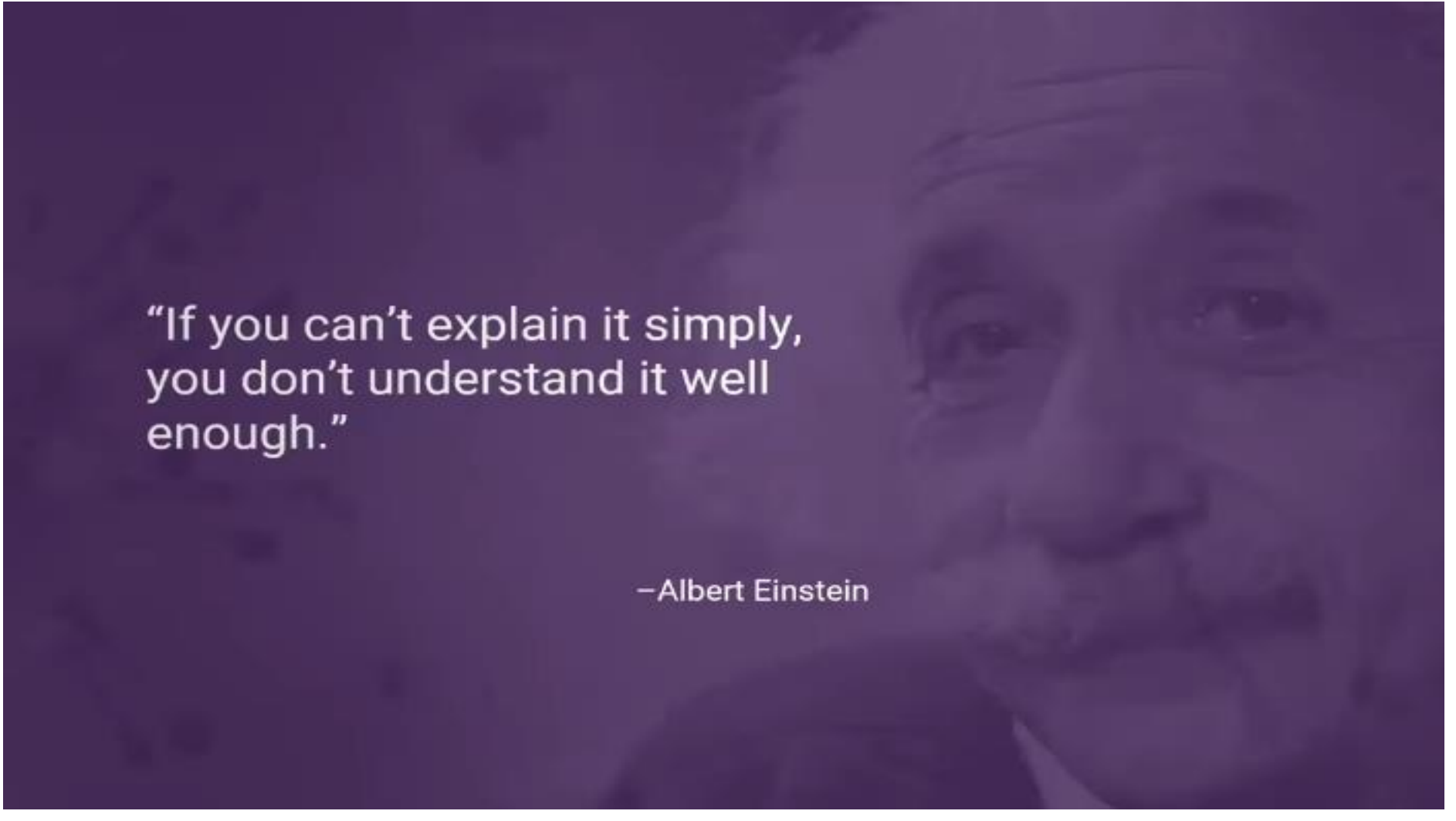
2. Value based care model (patient experience)

3. Daily management system



Daily Management System (Tools for sustaining)




“If you can’t explain it simply,
you don’t understand it well
enough.”
–Albert Einstein

Conclusion

Applying lean tools gave **an opportunity to identify problems** from patients perspective as well as from frontline staff who deal with patient closely especially during crisis

We can **continuously improve** through staff **engagemen**t with solution and innovative ideas which can **streamline the process and remove of waste**

Take home Messages:

Organizational readiness for implementing lean during crisis can be considered in terms of :

1. Understanding the customer (value)
2. Having a process view (value stream)
3. Identification of capacity and demand (flow and pull)
4. linking to strategy, engagement and participation of the staff for problem solving

Thank you

References