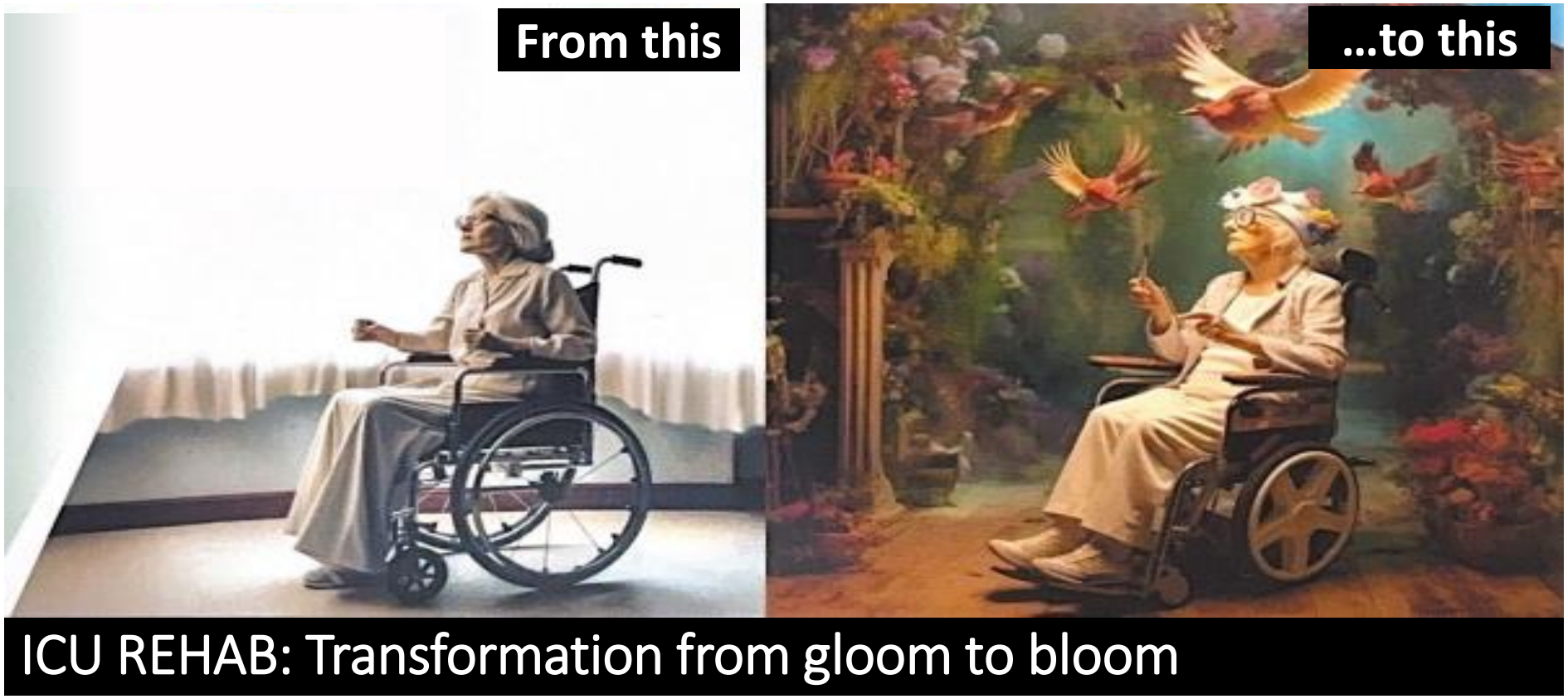
An audit of adult critical care rehabilitation processes, based on NICE guidelines, for improvements in critical care quality standards



ICU REHAB: Transformation from gloom to bloom

Reason for Choice of Audit

- The **majority of patients who survive critical illness have significant physical and nonphysical morbidity**.
- Following critical illness, care shifts from biomedical treatments to increasingly personal care that incorporates many dimensions, requiring rehabilitation services.
- Rehabilitation also involves biopsychosocial assessment and re-evaluation to ensure that the individual and their family/carers are supported to reach their full potential.
- Scientific **evidence shows early rehabilitation of ICU patients is safe, effective, and beneficial**. Rehabilitation reduces ICU and hospital stay, improves functional outcome, and strengthens peripheral and respiratory muscles. (Herridge et al, 2011, Morris et al, 2012, Schweickert et al, 2009).
- However, there are no National guidelines **quality-focused ICU Rehabilitation is not practiced in India. This often leads to delayed recovery, ongoing morbidity and patient suffering**.
- To improve our ICU care delivery, we have conducted a Clinical Audit based on the guidelines set by National Institute of Health and Care Excellence(NICE)

Objective

- **To improve the care quality systems and processes** for effective rehabilitation after critical illness in adults
- **To recruit as many of the eligible patients as possible** and to describe and document their rehabilitation needs

Standards set and Rationale

- **Standard**: Adults in critical care at risk of morbidity have their rehabilitation goals agreed within 4 days of admission to critical care or before discharge from critical care, whichever is sooner.
- **Source**: Rehabilitation after critical illness in adults. NICE guideline CG83 (2009), recommendation 1.4 , Quality standard [QS158]Published: 07 September 2017
- **Rationale**: Adults in critical care who are at risk of developing physical and non-physical morbidity need a comprehensive assessment to establish their rehabilitation needs and to put a rehabilitation plan in place.
- Rehabilitation goals need to be agreed with the person as early as possible to inform the rehabilitation programme.
- Starting rehabilitation early can improve physical and non-physical functioning and prevent future problems.
- The needs of a person in critical care can change very quickly, therefore goals should be continually reviewed and updated within the rehabilitation programme.

Methodology

- **Study Type**: A retrospective clinical audit was conducted
- **Study Setting:** ICU, Sakra World Hospital, Bangalore
- **Scientific Reference**: NICE – 'Rehabilitation after critical illness in adults'- Quality standard [QS158]Published: 07 September 2017
- **Audit Cycle 1: June – July 2023, Audit Cycle 2: Aug – Dec 2023**
- **Sample Size - Initial Audit: 57 Re-audit: 183**
- **Inclusion criteria :** all the adult patients admitted in Medical and surgical ICUs
- **Exclusion criteria :** discharge against medical advice, patients on End of Life Care, expired patients, pediatric and neonatal ICUs.

- **Structure**: Evidence of local systems to flag when adults in critical care are at risk of morbidity.
- **Process**: Proportion of adults in critical care at risk of morbidity who have their rehabilitation goals agreed within 4 days of being admitted to critical care or before discharge from critical care, whichever is sooner.
- **Quality Measure**: Numerator – the number in the denominator who have their rehabilitation goals agreed within 4 days of being admitted to critical

  care or before discharge from critical care, whichever is sooner.

  Denominator – the number of adults in critical care who are at risk of morbidity.
- **Data source**: review of patient hospital records.

Data Collection

- The ICU patient records and Master Registry(Microsoft Excel Sheet) were accessed
- **Data cleaning** was done and the data was taken up for analysis.
- **Data Compilation** - The total number of patients admitted in ICUs and survived as per inclusion criteria, total number of patients where a Short Clinical Assessment is conducted, number of patients where a Comprehensive Clinical Assessment were conducted and documented.
- Also the records for patient clinical outcome measures in terms of delirium, in bed mobility, out of bed mobility, assisted ambulatory training and total ICU stay days were calculated and compiled.

Initial Audit: Results & Findings

Full compliance $x \geq 95$ (or 100)%

Partial compliance 70%$\leq x <$94(or 99)%

Minimal compliance $x <$ 69%

	Standards & Criteria	Quality Measures	Rationale	Target	1st Audit Aug 2023
1	**STRUCTURE**: Adults in critical care at risk of morbidity have their rehabilitation goals agreed within 4 days of admission to critical care or before discharge from critical care, whichever is sooner.	Evidence of local systems to flag when adults in critical care are at risk of morbidity.	Adults in critical care at risk of morbidity to have their rehabilitation goals agreed and documented.	Yes/No	**NO**
2	**PROCESS**: A short clinical assessment is performed as early as clinically possible during the person's critical care stay, to determine their risk of developing physical and non-physical morbidity.	Numerator: Total number of Critical Care patients who have undergone SCA Denominator: Total number of patients admitted in Critical Care unit	Short clinical assessment is a brief clinical assessment to identify patients who may be at risk of developing physical and non-physical morbidity.	100%	**0**
3	**PROCESS:** People identified as being at risk of physical and non-physical morbidity have a comprehensive clinical assessment performed to identify their current rehabilitation needs.	Numerator: Total number of Critical Care patients identified as at risk who have undergone CCA Denominator: Total number of patients admitted in Critical Care unit identified as at risk during SCA	Adults in critical care who are at risk of developing physical and non-physical morbidity need a comprehensive assessment to establish their rehabilitation needs and to put a rehabilitation plan in place.	100%	**0**
4	**PROCESS:** Rehabilitation goals are agreed and documented within 4 days of admission to critical care or before discharge from critical care, whichever is sooner.	Numerator: Total number of Critical Care patients where Rehabilitation goals are agreed within 4 days of admission to critical care or before discharge from critical care Denominator: Total number of patients admitted in Critical Care unit who have undergone CCA and with identified goals	Rehabilitation goals can be short, medium or long term and will change throughout the person's recovery from critical illness.	100%	**0**
5	**PROCESS:** People at risk start rehabilitation, based on the comprehensive clinical assessment and rehabilitation goals, as soon as clinically possible.	Numerator: Total number of Critical Care patients at risk who start rehabilitation interventions based on identified goals Denominator: Total number of patients admitted in Critical Care unit who have undergone CCA	Starting rehabilitation early can improve physical and non-physical functioning and prevent future problems.	100%	**0**

Mean Age	62.71yrs

Gender	64.9% Male	35.1% Female

Recommendations

- **Education** to ICU and rehabilitation staff on NICE rehabilitation guidelines.
- Clinical Outcome measures were introduced (Chelsea Critical Care Physical Assessment Tool, Medical Research Council Strength score
- **New physiotherapy documentation** was developed to facilitate comprehensive assessment.
- **Dedicated specialist cardiopulmonary physiotherapists** trained and posted full time in ICUs to proactively conduct a Short Clinical Assessment on all admissions to identify those who need further rehabilitation care and then conduct a Comprehensive Clinical Assessment to set short term, medium and long term goals.
- **Multidisciplinary team meetings** to sensitize all stakeholders to timely identify potential beneficiaries and take ICU diaries on time for early intervention.
- Simple to advanced technology is required to establish good structure of facilities dedicated for ICU and a robust **clinical care pathway** to be followed and tracked.

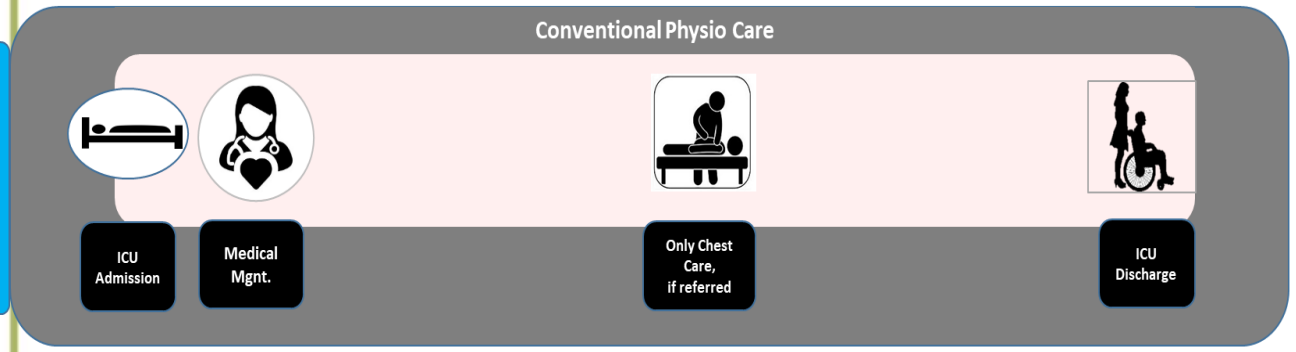
Quality Improvement

PLAN	DO	CHECK	ACT
• Literature Review • Concept & Approvals • Mobilizing Specialists • Multidisciplinary Team formation • Skill Training • SOP creation • Equipment mobilization • Assessment Forms • Care Pathway	• Pilot Trial • Risk stratification and comprehensive assessment • Referrals and recruitment • Data capturing • Use of advanced technology	• Review of Forms & Formats • Genba audits • Interaction with caregivers and referral authorities • Documentation audits • Feedback • Outcome • Effective utilization of resources	• Care Pathway modification • Revision of Assessment forms • Outcome measures finalization • KPI calculation Chart • Daily Communications Tracker • Documented Hand Off • TAT and billing

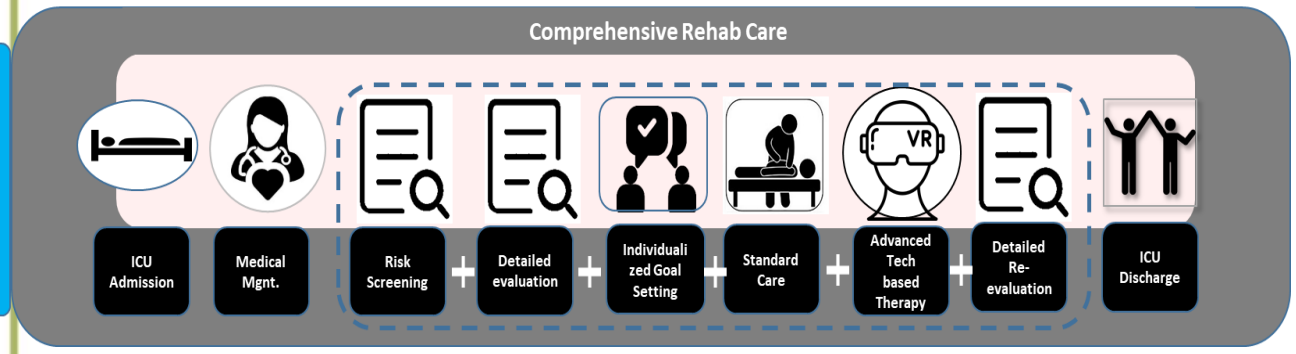
Changing conventional mind-set and traditional care strategies was most challenging.

Quality Improvement, Contd.

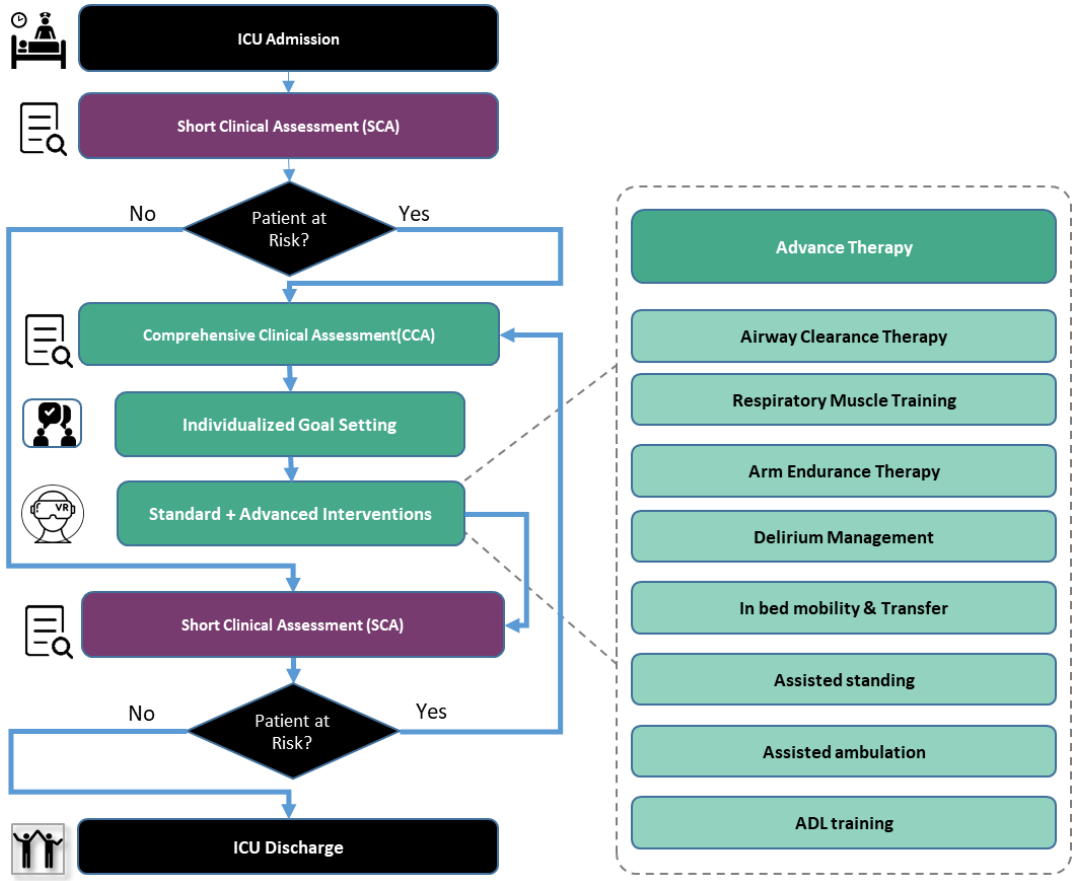
Before Kaizen



After Kaizen



Care Pathway for Critical Care Rehab



Immersive Virtual Reality – Delirium Care & Mobility Training

*Photo/Video Consent is obtained

Ankle Mobilizer for DVT Prevention

Neuromuscular Activation

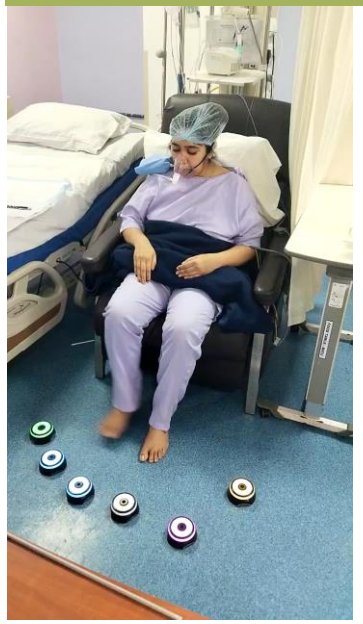
Digital Hand Mobilizer

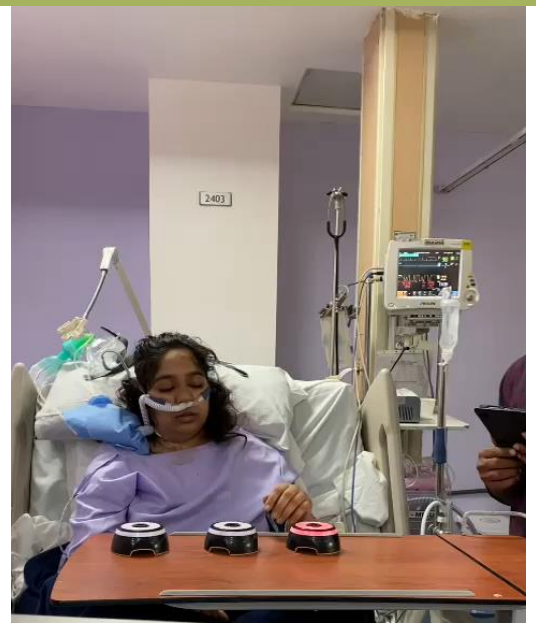
*Photo/Video Consent is obtained

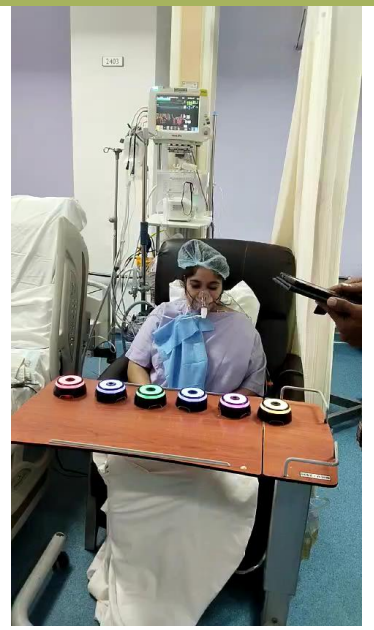
Early Activation using Active Passive Cycle

*Photo/Video Consent is obtained

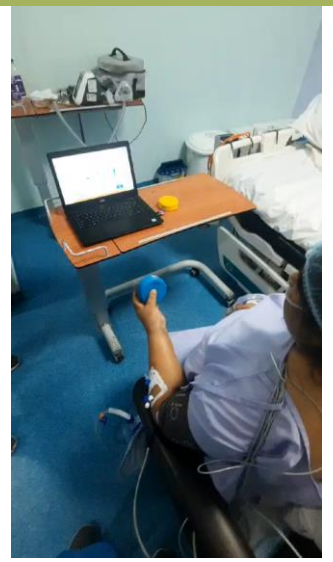
Digital Reflex and Agility Training for Delirium management and Cognition

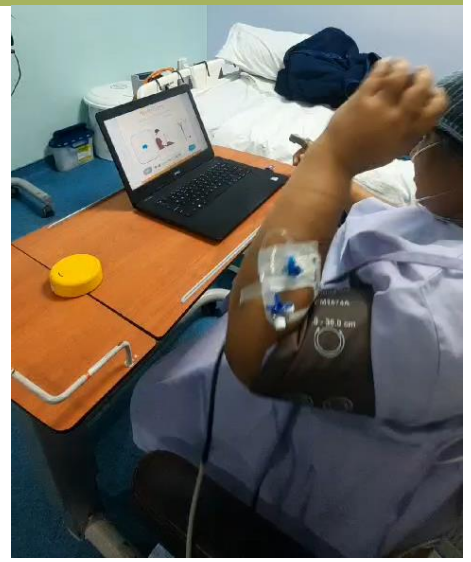






IMU Sensors for endurance training





*Photo/Video Consent is obtained

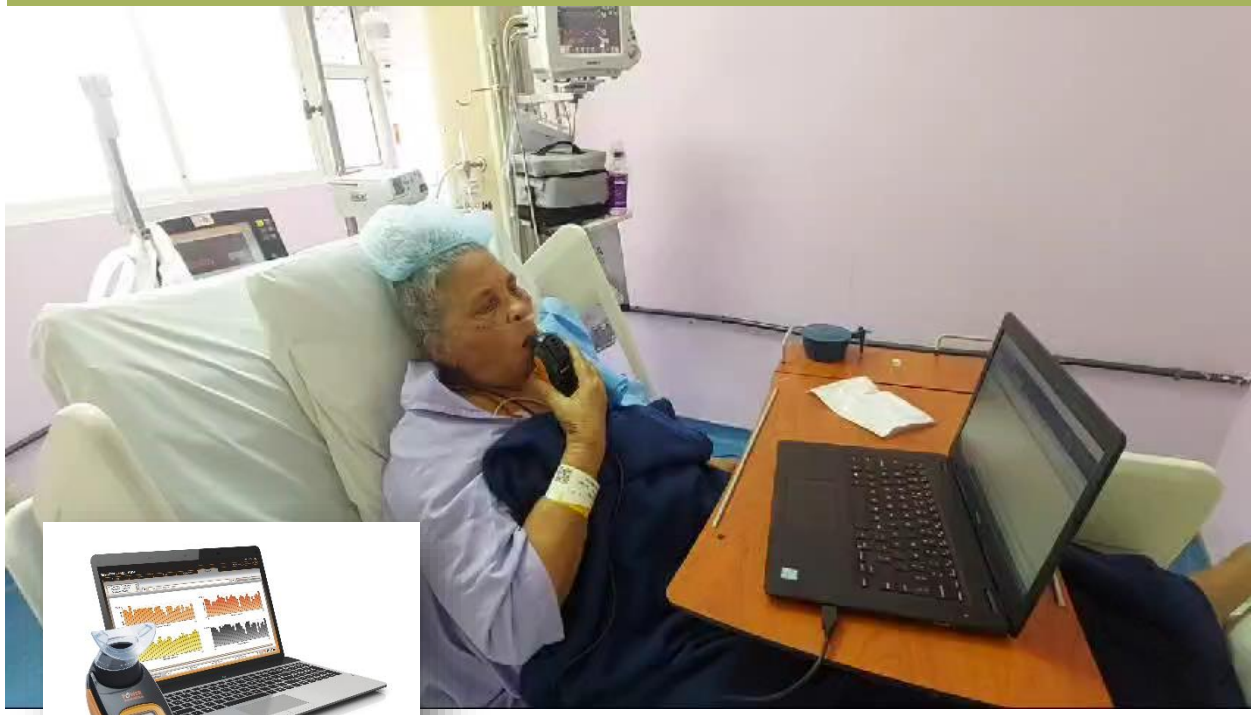
Japanese Sittan®, Safe Stand & Walk Assist

Early Mobilization with Digital Ambulatory Monitoring

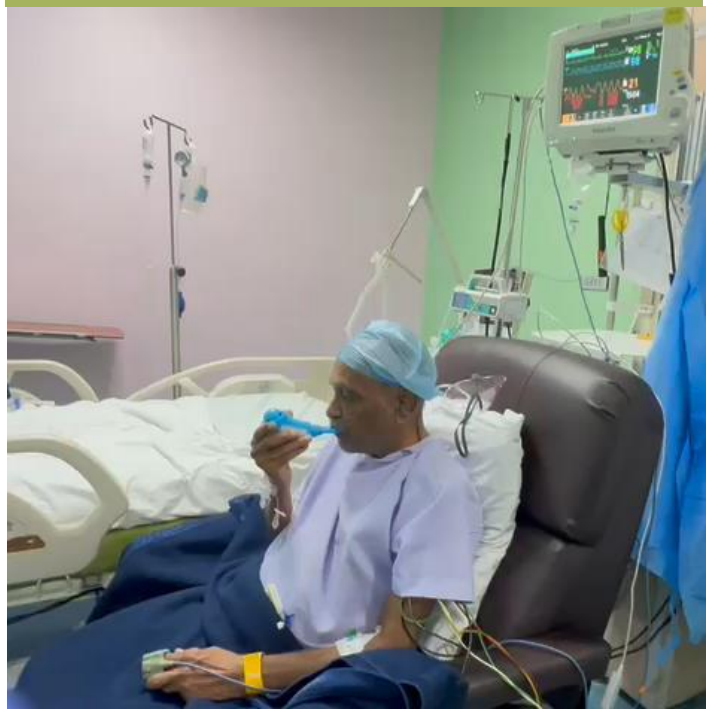
*Photo/Video Consent is obtained

Respiratory strength and Conditioning

Digital Inspiratory Muscle Trainer



Positive Expiratory Pressure



Volumetric Spirometer

*Photo/Video Consent is obtained

Wearable Sensors for Gamified Mobility

*Photo/Video Consent is obtained

Re-Audit: Results & Findings

Full compliance $x \geq 95$ (or 100)%

Partial compliance 70%$\leq x <$94(or 99)%

Minimal compliance $x <$ 69%

	Standards	Quality Measures	Rationale	Target	1st Audit Aug 2023	Re-audit Jan 2024
1	**STRUCTURE**: Adults in critical care at risk of morbidity have their rehabilitation goals agreed within 4 days of admission to critical care or before discharge from critical care, whichever is sooner.	Evidence of local systems to flag when adults in critical care are at risk of morbidity.	Adults in critical care at risk of morbidity to have their rehabilitation goals agreed and documented.	Yes/No	**NO**	**YES**
2	**PROCESS**: A **short clinical assessment(SCA)** is performed as early as clinically possible during the person's critical care stay, to determine their risk of developing physical and non-physical morbidity.	Numerator: Total number of Critical Care patients who have undergone SCA Denominator: Total number of patients admitted in Critical Care unit	Short clinical assessment is a brief clinical assessment to identify patients who may be at risk of developing physical and non-physical morbidity.	100%	**0**	**87.9%**
3	**PROCESS:** People identified as being at risk of physical and non-physical morbidity have a **Comprehensive Clinical Assessment (CCA)** performed to identify their current rehabilitation needs.	Numerator: Total number of Critical Care patients identified as at risk who have undergone CCA Denominator: Total number of patients admitted in Critical Care unit identified as at risk during SCA	Adults in critical care who are at risk of developing physical and non-physical morbidity need a comprehensive assessment to establish their rehabilitation needs	100%	**0**	**84.8%**
4	**PROCESS: Rehabilitation goals are agreed and documented** within 4 days of admission to critical care or before discharge from critical care, whichever is sooner.	Numerator: Total number of Critical Care patients where Rehabilitation goals are agreed within 4 days of admission to critical care or before discharge from critical care Denominator: Total number of patients admitted in Critical Care unit who have undergone CCA and with identified goals	Rehabilitation goals can be short, medium or long term and will change throughout the person's recovery from critical illness.	100%	**0**	**100%**
5	**PROCESS: People at risk start rehabilitation**, based on the comprehensive clinical assessment and rehabilitation goals, as soon as clinically possible.	Numerator: Total number of Critical Care patients at risk who start rehabilitation interventions based on identified goals Denominator: Total number of patients admitted in Critical Care unit who have undergone CCA	Starting rehabilitation early can improve physical and non-physical functioning and prevent future problems.	100%	**0**	**100%**

Mean Age	61.26yrs	Gender	60.7% Male	39.3% Female

Follow up & Evaluation of Change

- Re-audit analysis was done to understand gaps for further improvement.
- **Further streamlining** to ensure 100% adherence to proactive risk detection and provision of advanced rehabilitation
- **Genba supervision by seniors** is a must since decisions are complex and every patient on every touchpoint pause new challenges
- **Weekly review and Periodic staff sensitization**

Conclusion

- Compliance **significantly improved since 1st audit**.
- **Implementing a new structure and procedure for assessment and management** of the patients rehabilitation process has facilitated this success. It's a paradigm shift in ICU mobility culture
- **Implications:** Use of the validated CPax tool assists in identifying patients rehabilitation needs both on admission and at discharge from ICU.
- Utilization of physical therapy services beyond routine chest care is essential to improve the **functional outcomes and quality of life among ICU survivors and NOT mere survival**!

Impact of Audit

This audit shows by increasing rehabilitation on ICU, patients become functionally stronger and leave ICU and hospital quicker. Patients achieve improved functional scores and greater independence.

1. **Reduced Length of Stay**
2. Improved Physical Function
3. Faster Recovery
4. Enhanced Cognitive Function
5. **Better delirium management**
6. Improved Emotional Well-being
7. **Reduced Risk of Complications**
8. Prevention of Disability and Impairment
9. Increased ICU Survival rate
10. **Improved Quality of Life**

Successful ICU care-pathway, first time in India
Innovative tech empowerment = faster recovery
Significant paradigm shift in ICU work culture
Easily adaptable Quality Framework in all organizations

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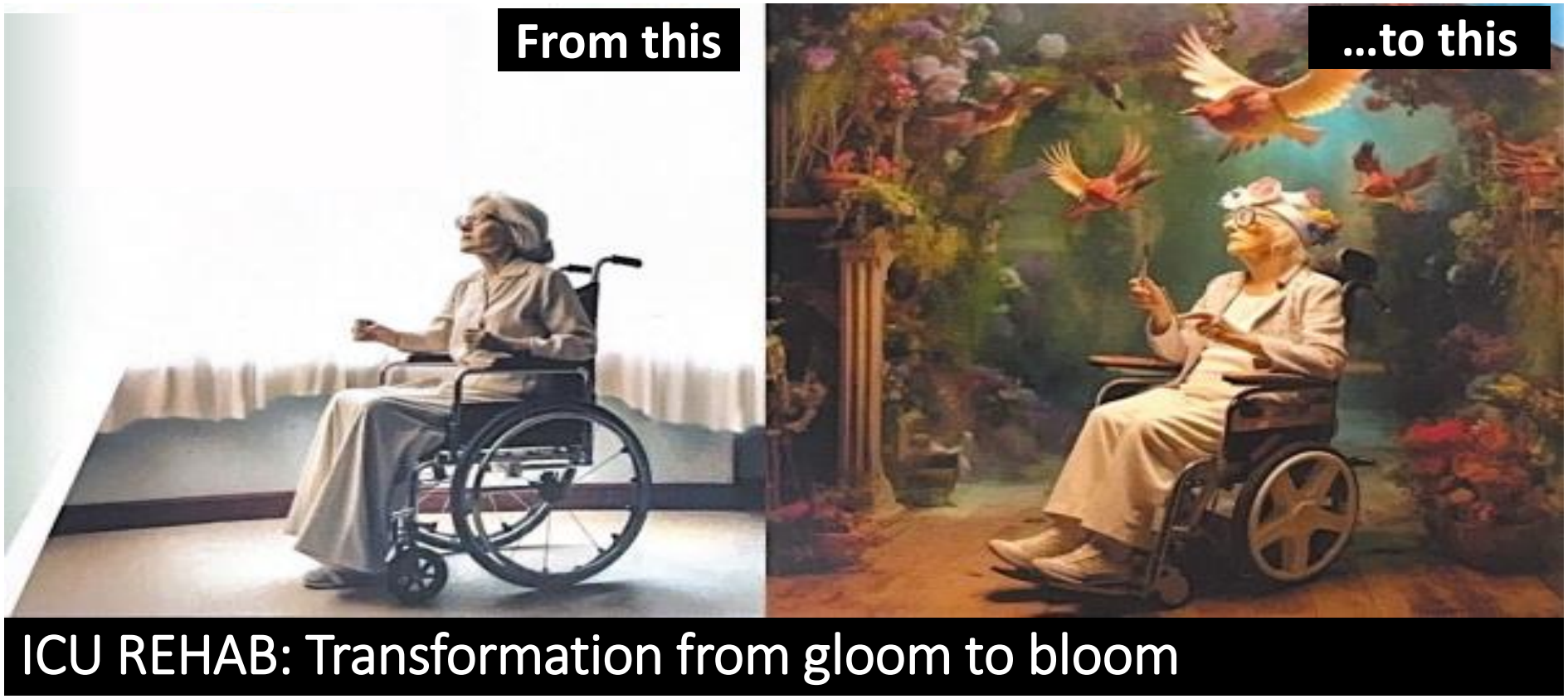

ICU REHAB: Transformation from gloom to bloom

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