



Toyota, Continuous Improvement & Critical Care

Martin Tierney
Director

@SeatingMatters
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THE TOYOTA WAY

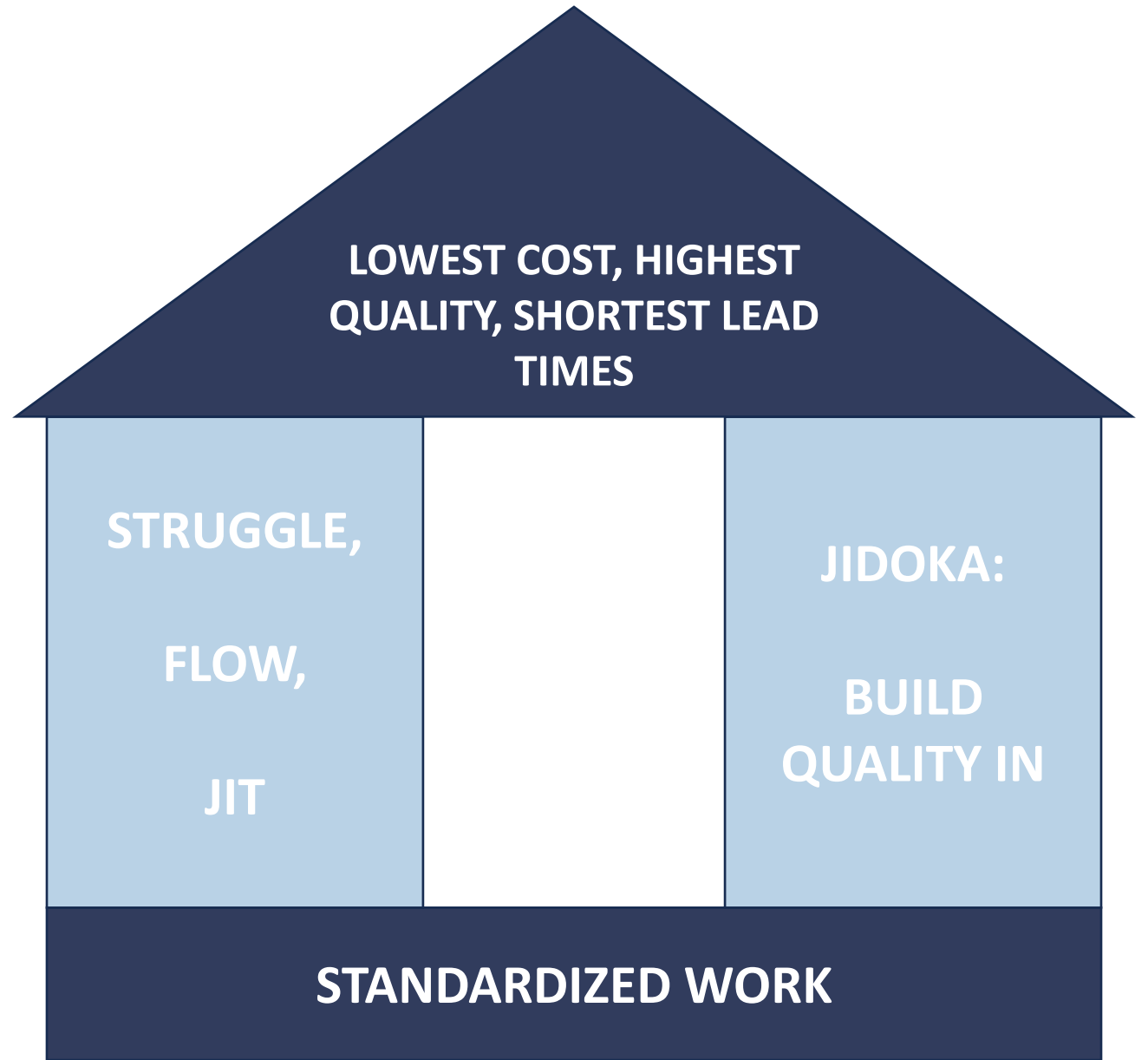
"Toyota is as much a state of mind as it is a car company."
-USA TODAY

THE COMPANY THAT INVENTED LEAN PRODUCTION



14 MANAGEMENT PRINCIPLES
FROM THE WORLD'S GREATEST MANUFACTURER

JEFFREY K. LIKER





 Seating Matters







reddot design award



COACH HOUSE BRASSERIE
Open Daily Serving Lunch & Dinner



2 Second
Lean

Summit

IRELAND 2023

LeanMade
SIMPLE

 Seating
Matters

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My History at Toyota



1947
5 years old



1959
17 years old
High school



1970
23 years old
Engineer



1984
31 years old
Paint shop Mgr.



2000
58 years old
CEO

- 1942 Born in Feb. 11th
 - 1964 Graduated
 - 1964 Quality Engineer
 - 1988 General Manager
 - 1992 General Manager
 - 1995 General Manager
 - 1997 Vice President
 - 1998 President & CEO
 - 2001 Chairman
 - 2002 Vice president
 - 2006 Special Advisor
 - 2009 President
- 81 years old and looks like 65 :0)
- Waseda Univ. Mechanical Engineering
- Motomachi plant
- Plastics. Tsutsumi plant
- Assembly Tsutsumi plant
- Engineering Tsutsumi plant
- Georgetown Kentucky
- Georgetown Kentucky
- Georgetown Kentucky
- Kyushu Lexus
- Yokohama Lexus Support Suppliers
- Institute, Manufacturing Excellence



Life of Toyota



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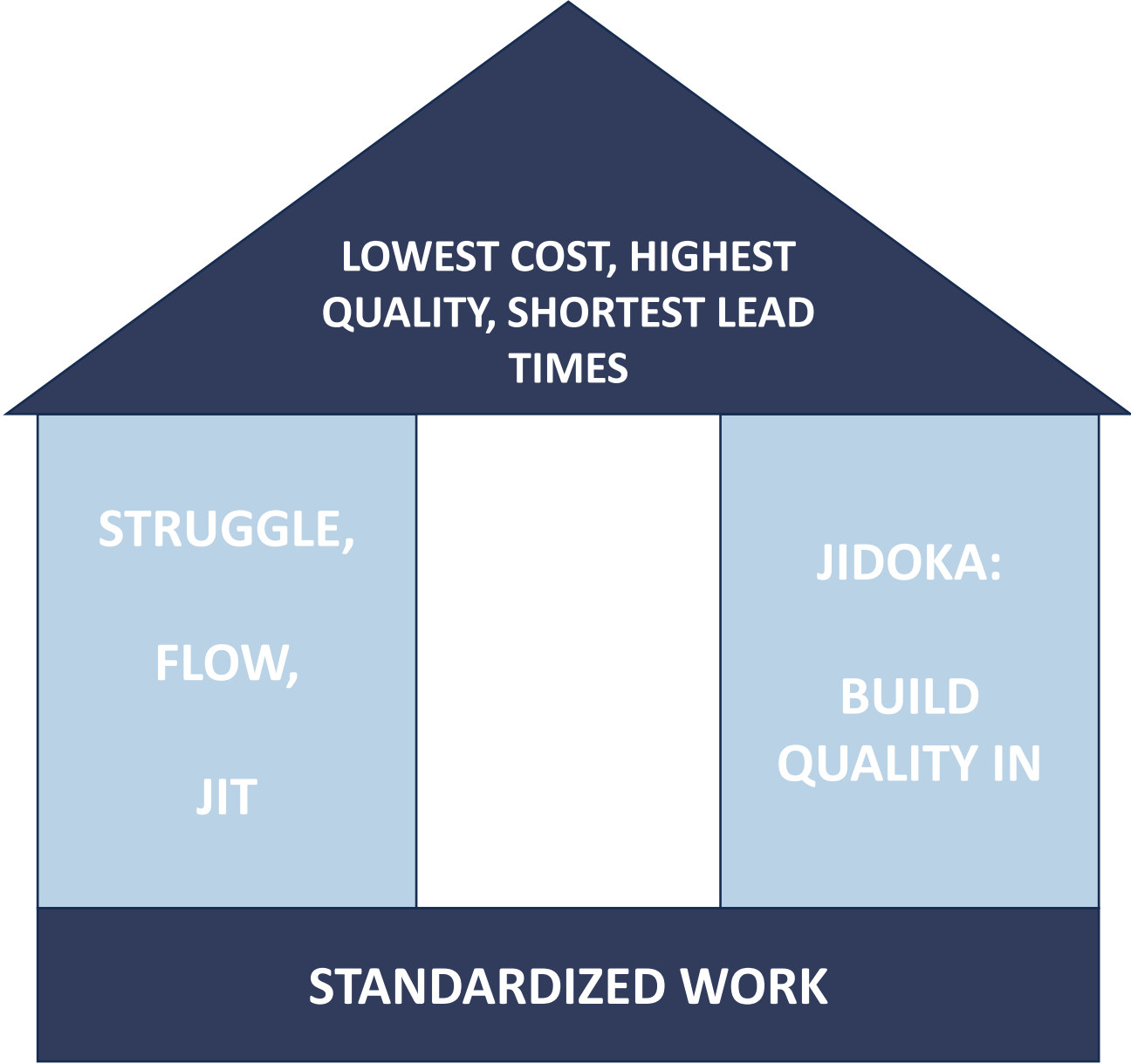
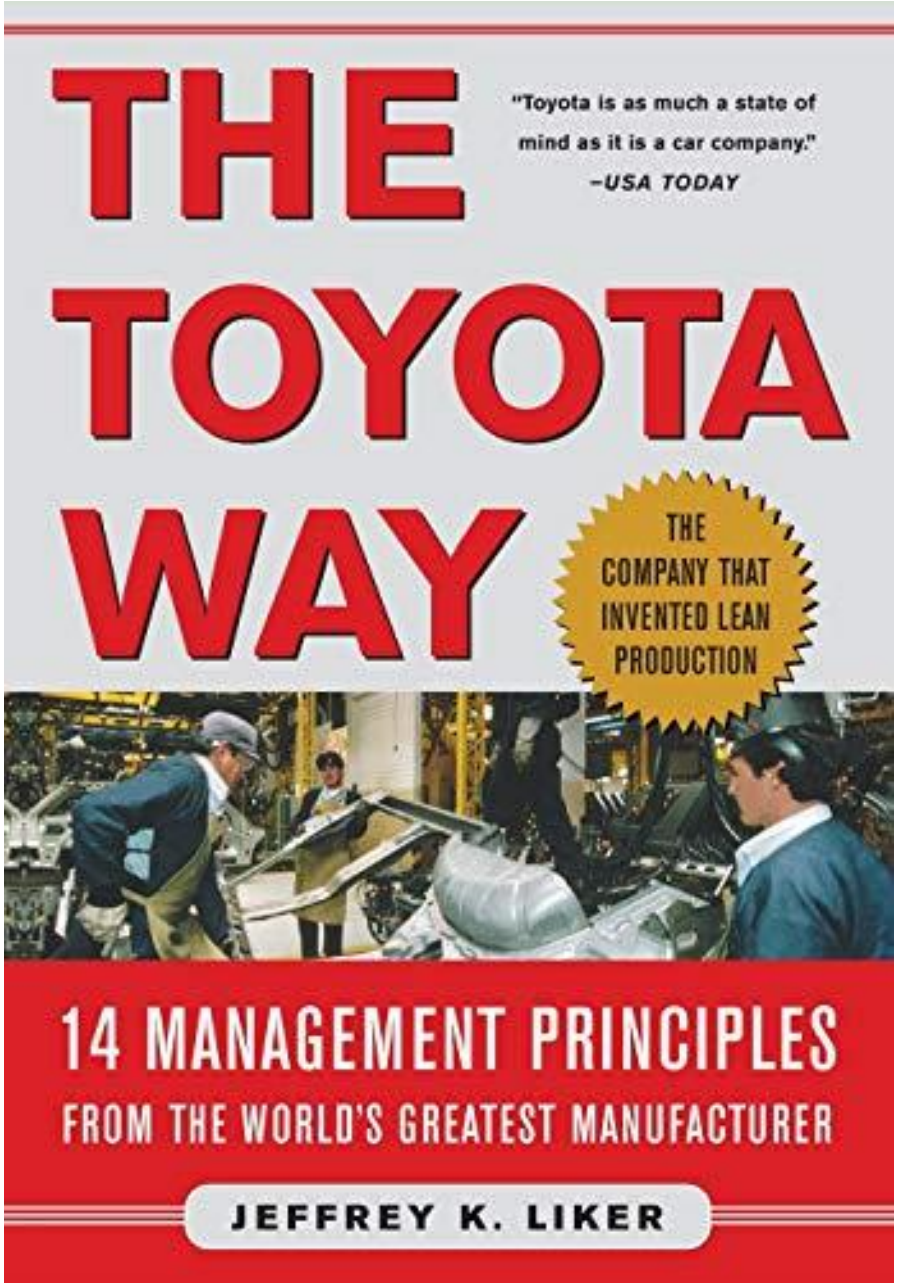
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6.30 PM
DINNER & PAUL AKERS
IN CONVERSATION WITH
MR AMEZAWA



Lean Made
SIMPLE



Seating Matters

Chairs, engineered for care.







Los Angeles
London
New York
Tokyo

Seating Matters

Seating Matters



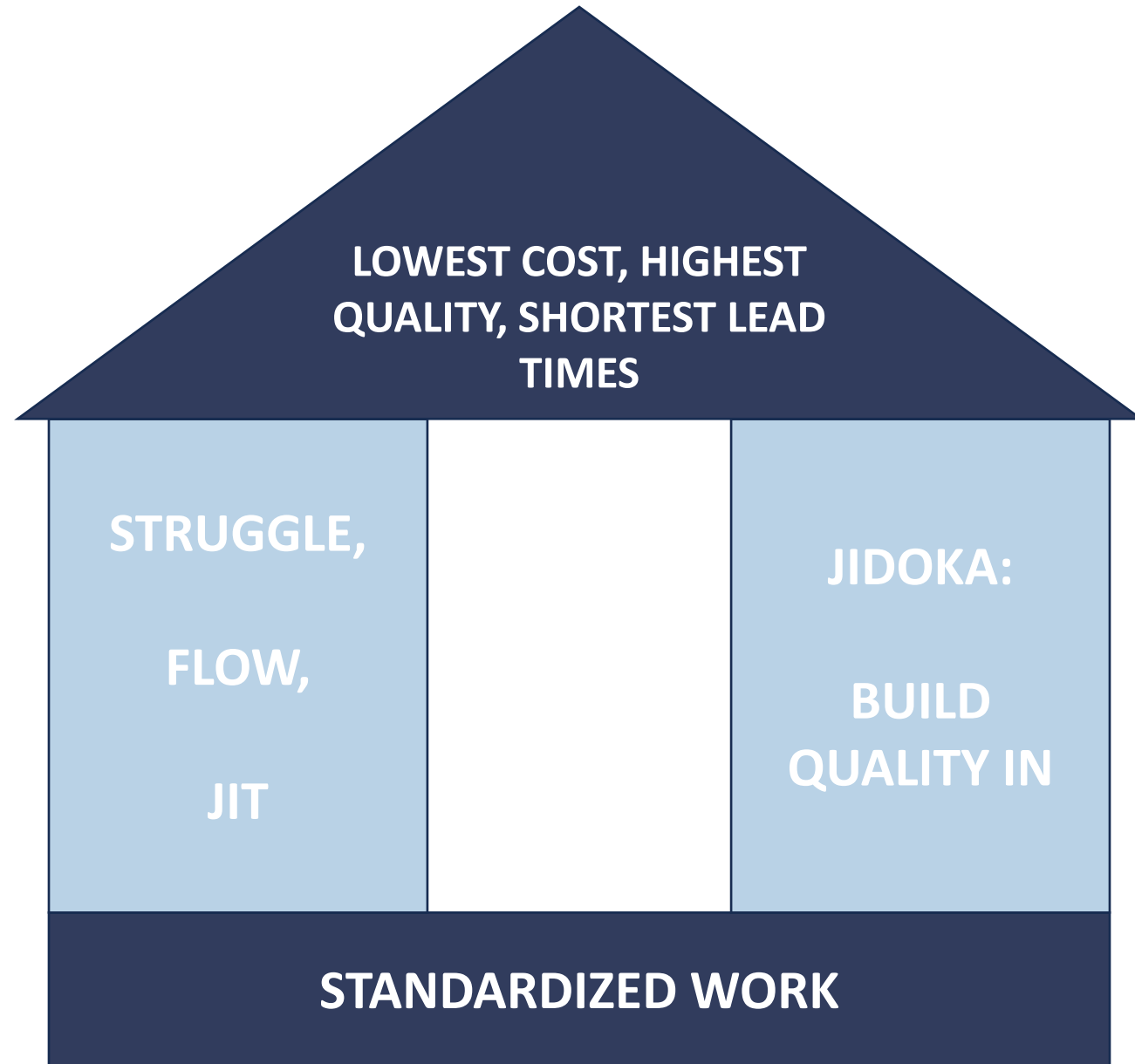
**“TPS WILL SOLVE ALL
YOUR PROBLEMS”**



























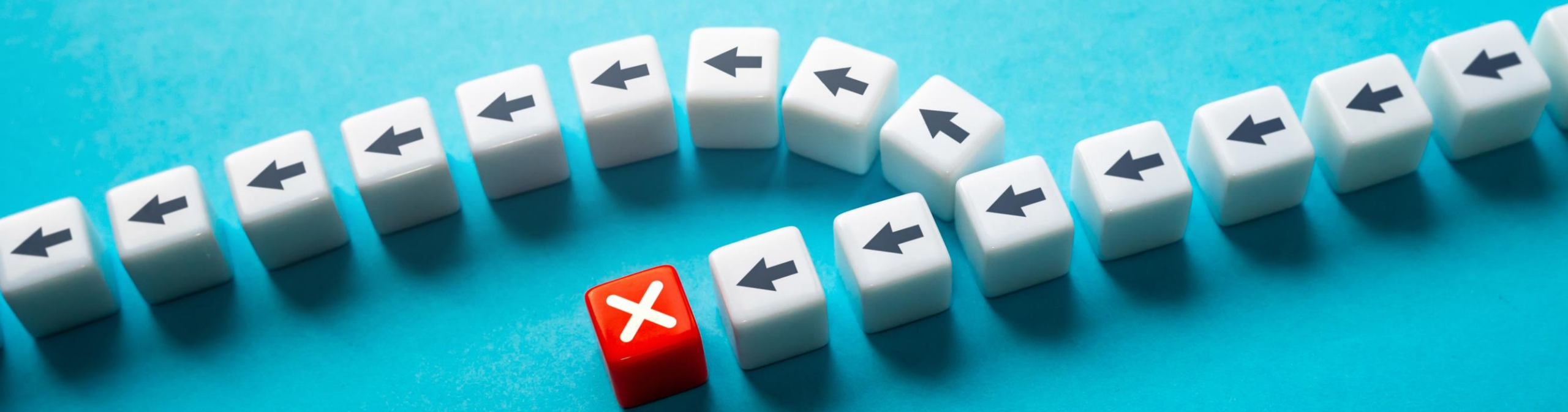


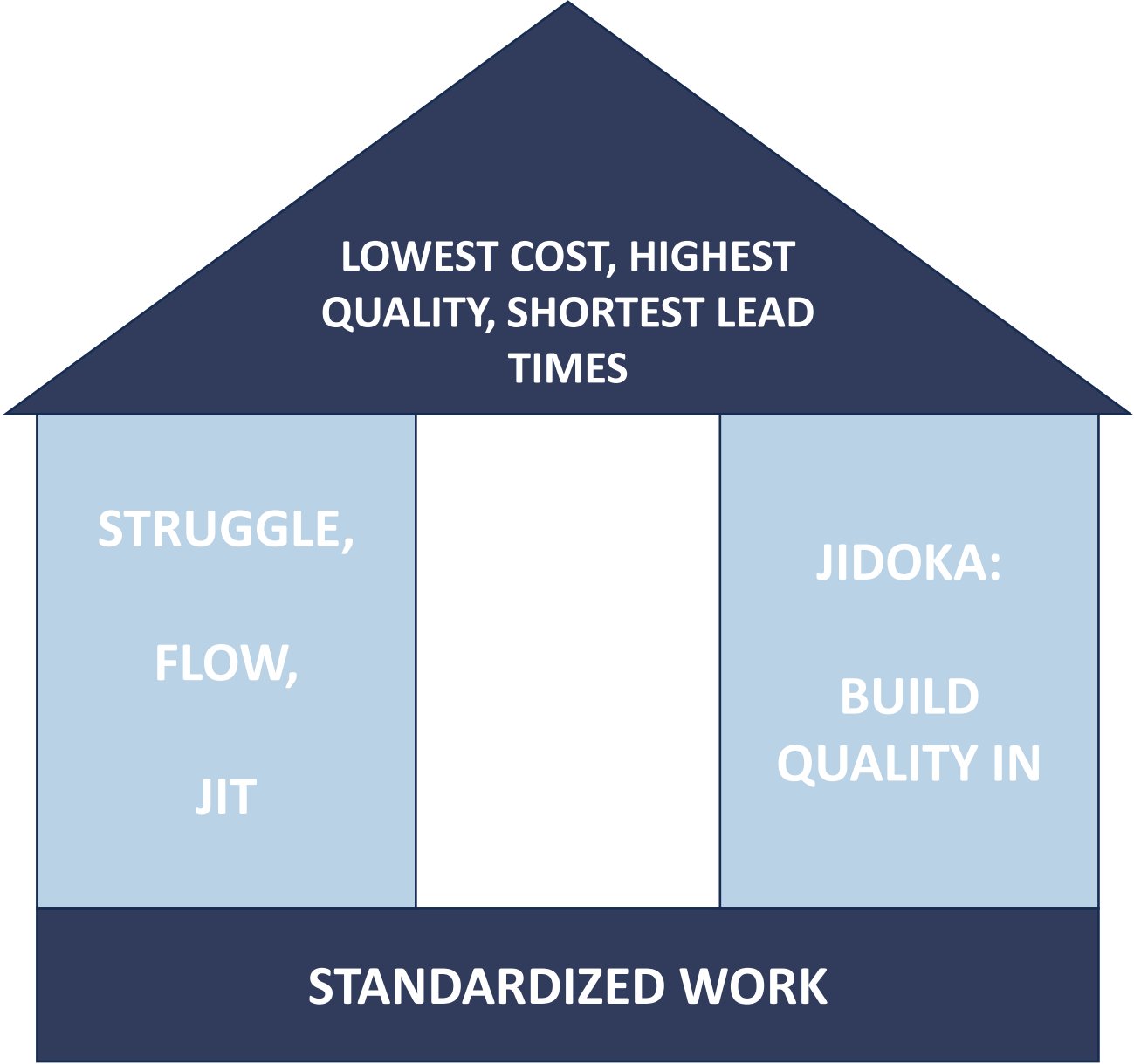








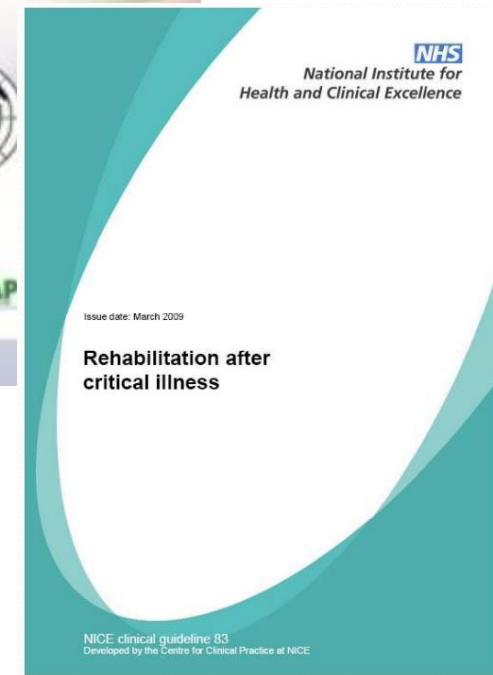
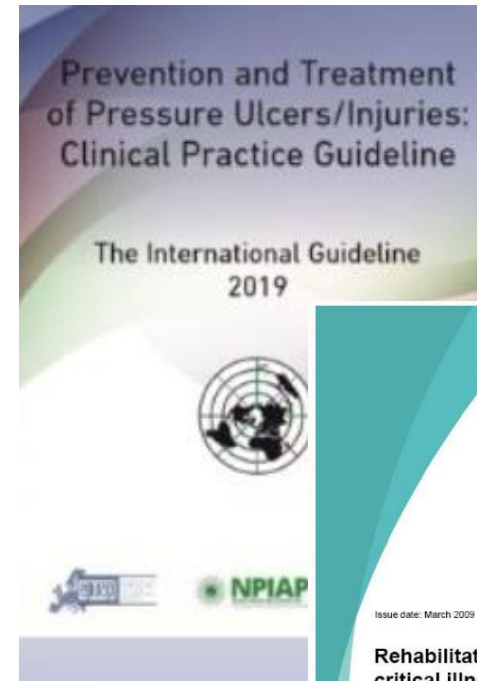




1. STANDARDISED WORK



Clinical guidelines & expert recommendations



Early Mobilisation

Early mobilisation in ventilated adult ICU patients has shown benefits v. later mobilisation:

- + Muscle strength and physical function.³

Also, a decrease in:

- + Duration of mechanical ventilation.
- + ICU length of stay.
- + Hospital length of stay.⁴

3. *Menges, D et al. [2021]*

4. *Monsees, J et al. [2022]*

NICE guidelines recommend starting rehabilitation as early as possible

Rehabilitation after critical illness in adults (CG83)

- + For patients at risk, (of developing physical and non-physical morbidity) start rehabilitation as early as clinically possible, based on the comprehensive clinical assessment and the rehabilitation goals.

International pressure injury guidelines

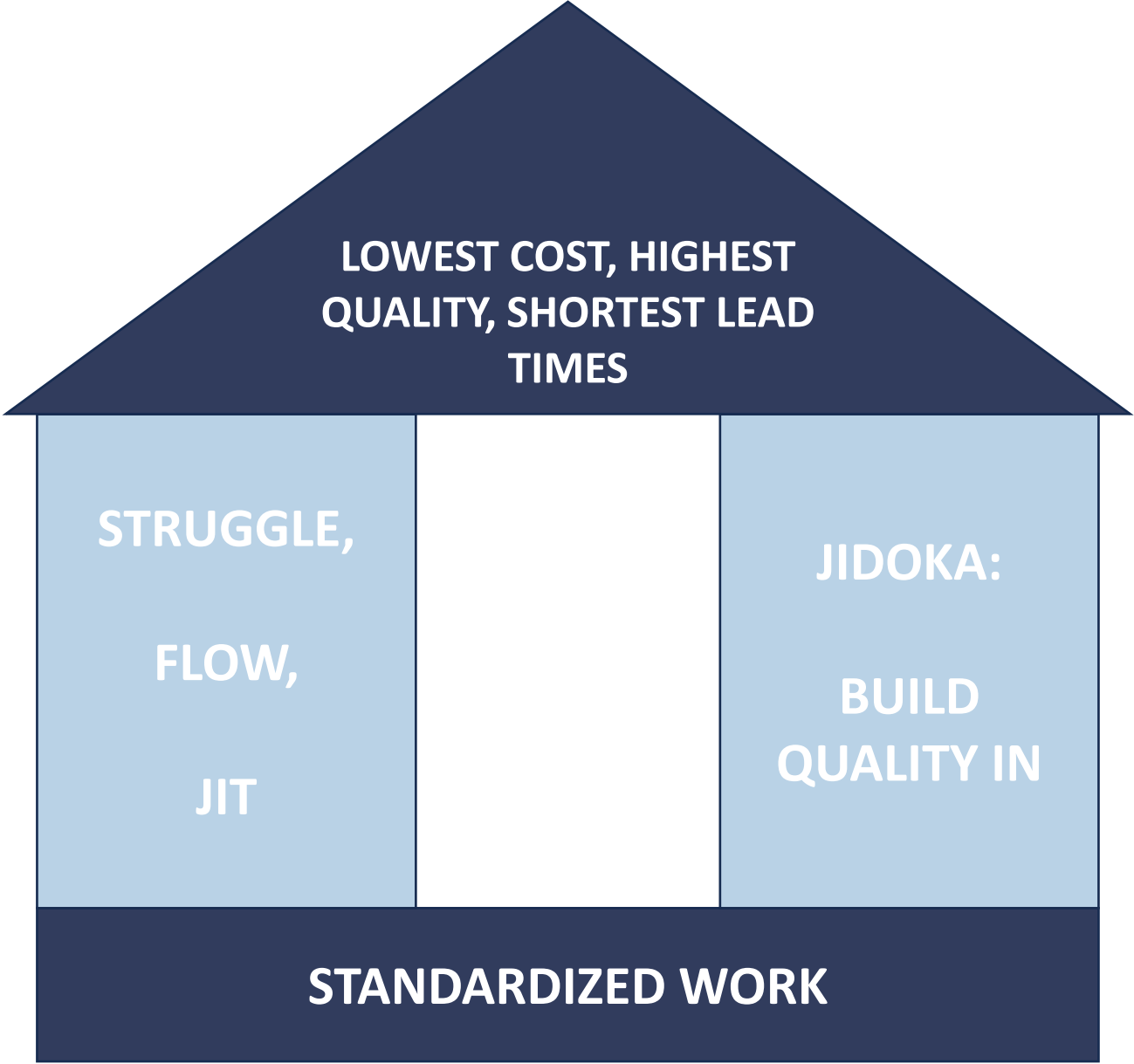
- + Consider individuals with limited mobility, limited activity and a high potential for friction and shear to be at risk of pressure injuries.
- + Implement an early mobilisation program that increases activity and mobility as **rapidly as tolerated**.

8. *EPUAP/NPIAP/ PPPIA – 2019*

Expert consensus & recommendations on safety support early mobilisation

9. *Hodgson et al – 2014*

- + Mobilization of adult, mechanically ventilated patients in the ICU.
- + Have the potential to guide ICU rehabilitation whilst minimizing the risk of adverse events.



2. JIDOKA:

BUILDING QUALITY INTO
THE PROCESS

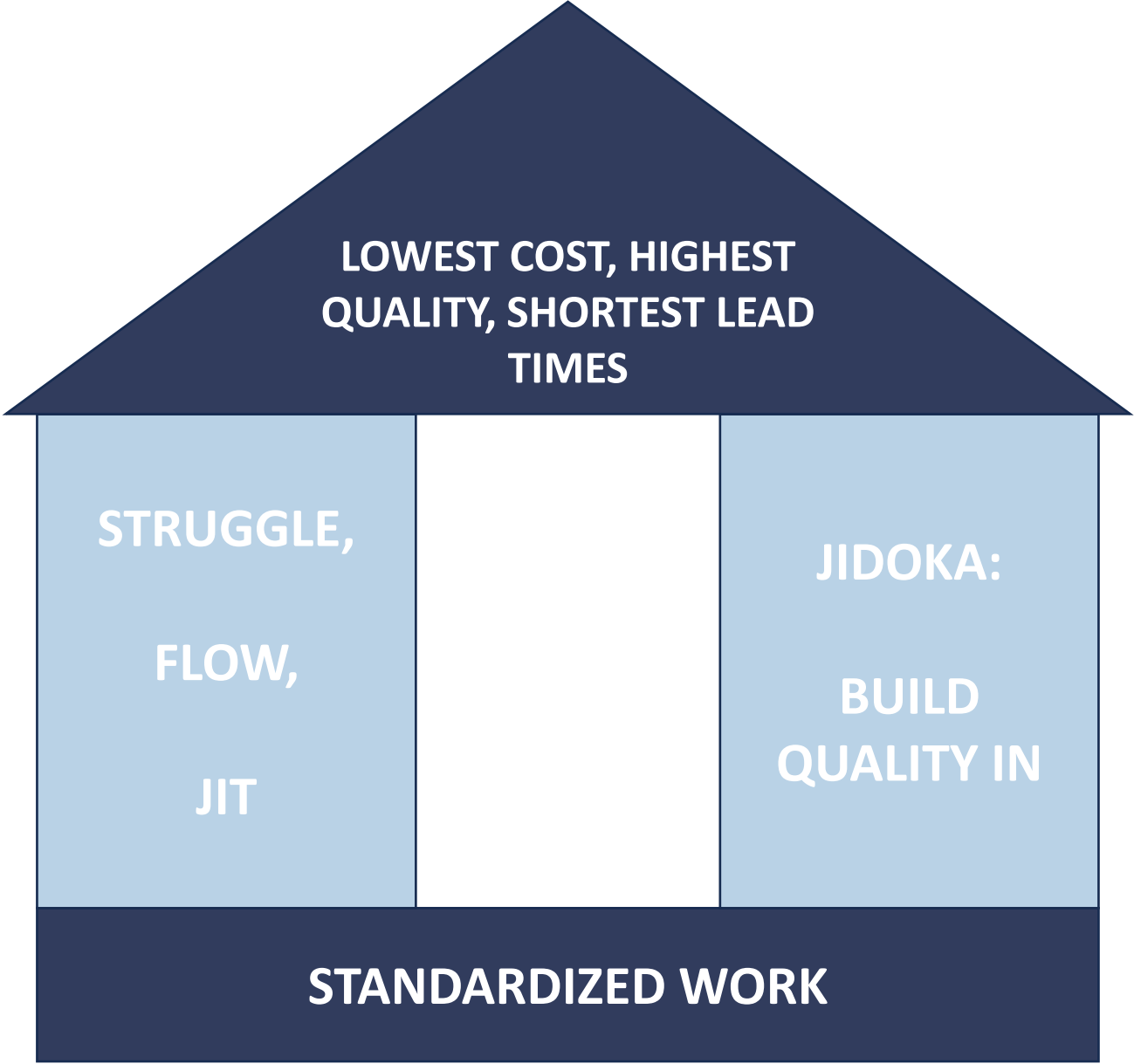
Problem with mobilisation

- + Difficulty
- + Staffing

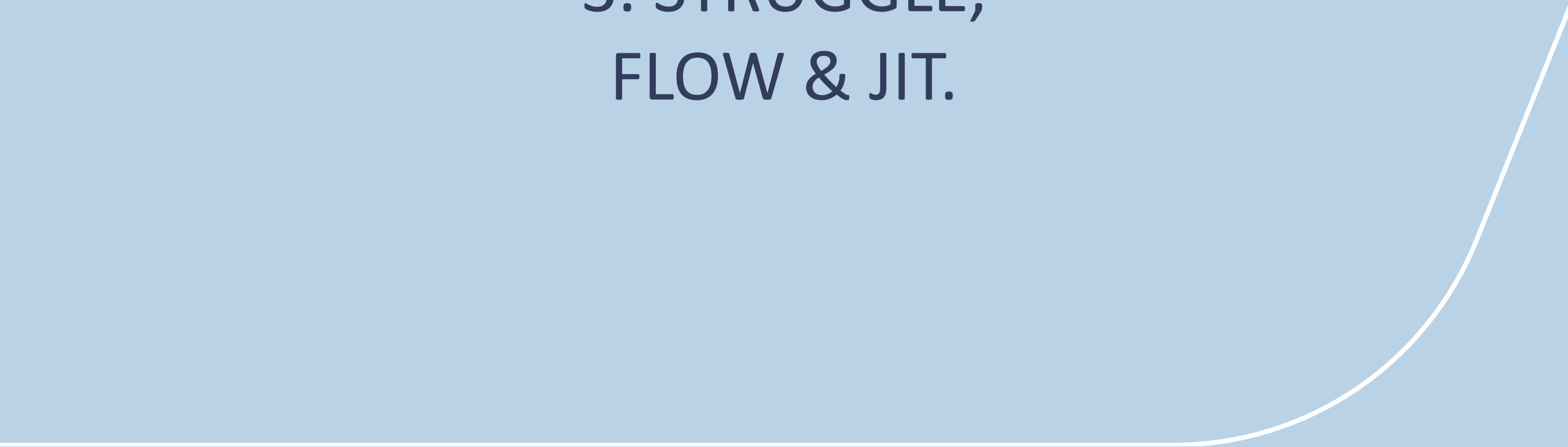


Problem with mobilisation

- + Confidence
- + Consistency



3. STRUGGLE, FLOW & JIT.



“Assistive equipment key to optimizing early mobilisation & rehabilitation”

6. Hodgson et al – 2021

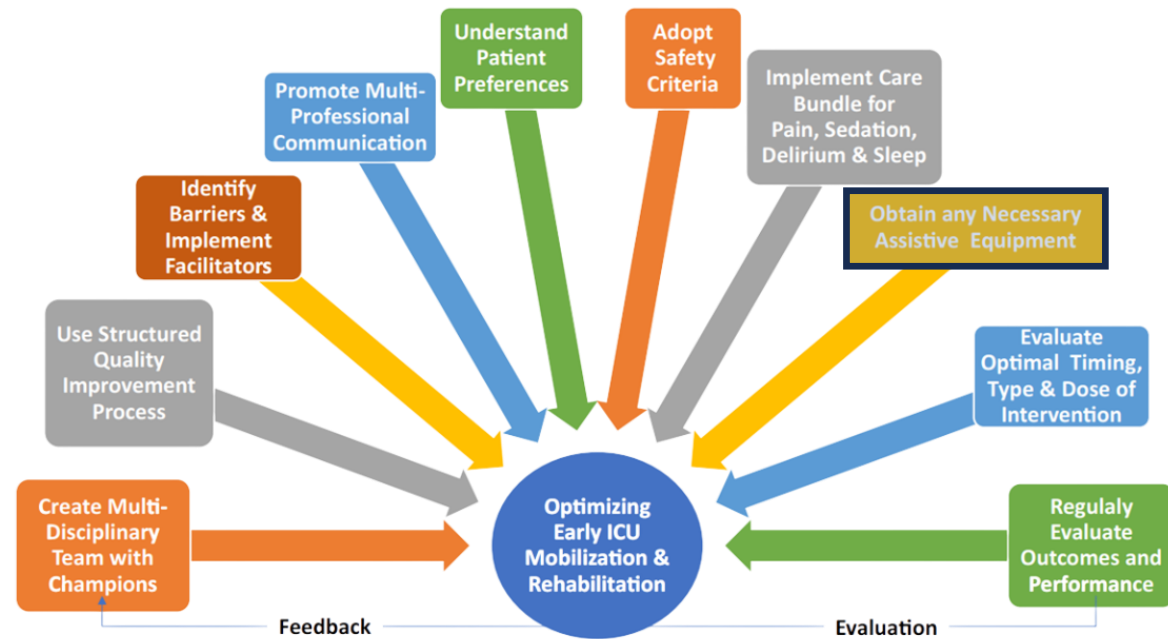


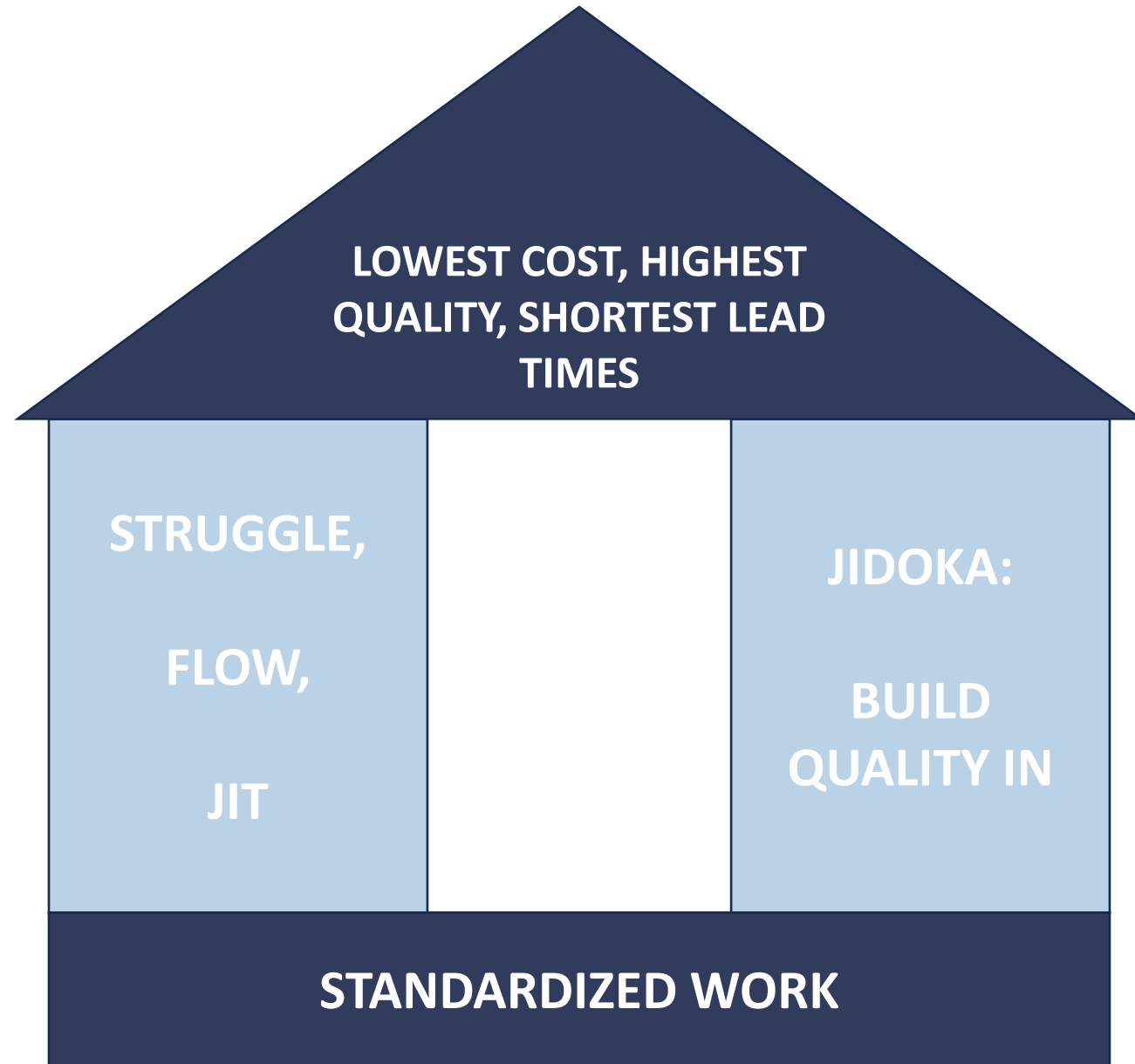
Fig. 1 Ten strategies to optimize early mobilization and rehabilitation in ICU

Struggle, flow & JIT

- + Not appropriate
- + Not considering ICU challenges

Struggle, flow & JIT

- + Discharged without improved mobility
- + Increased LOS
- + Readmission
- + Long term effects ICU stay



Sitting is
1st step to recovery
from critical illness

ICU Mobility Scale

	Classification	Definition
0	Nothing (lying in bed)	Passively rolled or passively exercised by staff, but not actively moving.
1	Sitting in bed, exercises in bed	Any activity in bed, including rolling, bridging, active exercises, cycle ergometry and active assisted exercises; not moving out of bed or over the edge of the bed.
2	Passively moved to chair (no standing)	Hoist, passive lift or slide transfer to the chair, with no standing or sitting on the edge of the bed.
3	Sitting over edge of bed	May be assisted by staff, but involves actively sitting over the side of the bed with some trunk control
4	Standing	Weight bearing through the feet in the standing position, with or without assistance. This may include use of a standing lifter device or tilt table.
5	Transferring bed to chair	Able to step or shuffle through standing to the chair. This involves actively transferring weight from one leg to another to move to the chair. If the patient has been stood with the assistance of a medical device, they must step to the chair (not included if the patient is wheeled in a standing lifter device).

5. Hodgson C et al., [2014]



Vivid Vision

PAST

NOW

FUTURE

Bed

Chair

Walking



Introducing Sydney GoFlat™



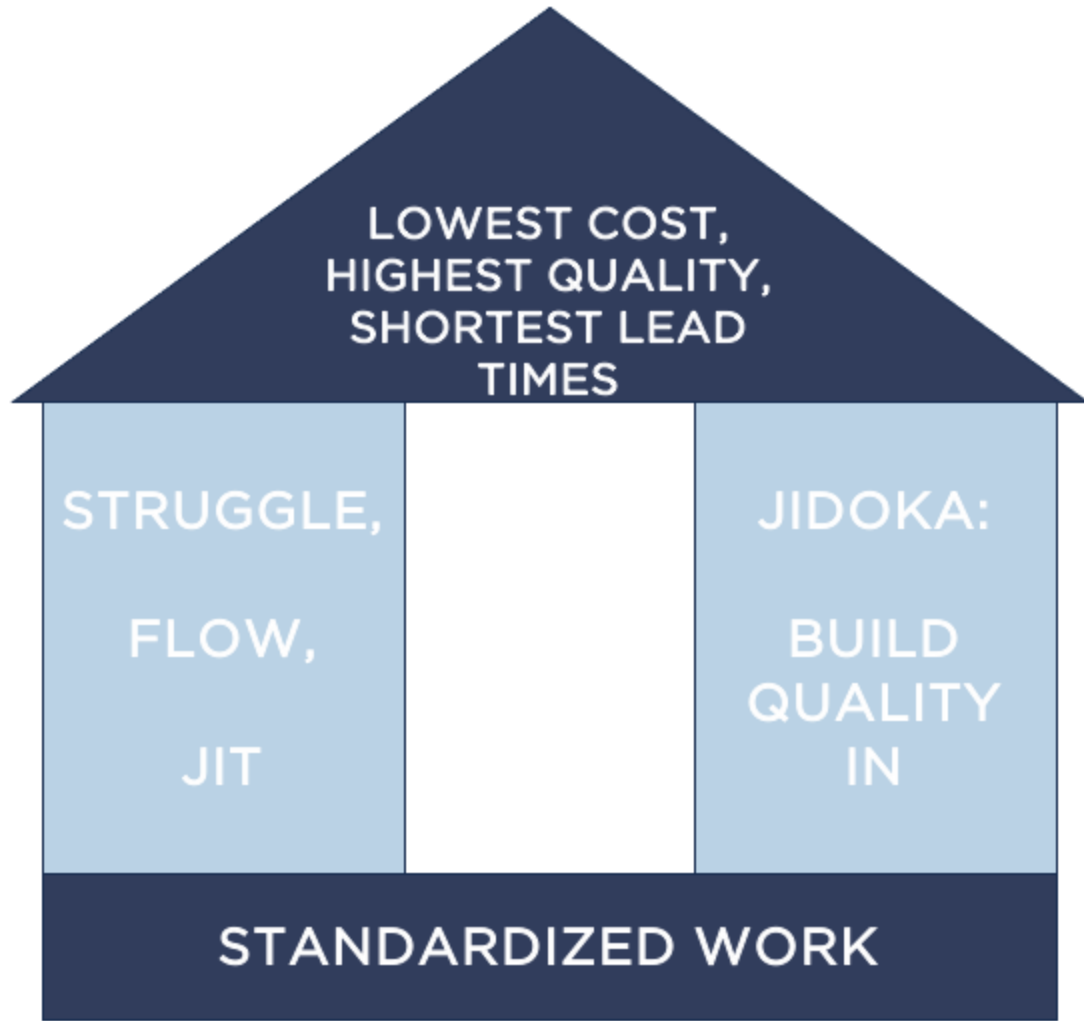


reddot design award

Introducing Sydney GoFlat™

- + **A new option** in early mobilisation and safe patient handling.
- + **Patient Experience** - Comfort, getting Patient out of bed, self reposition, enabling function, enabling to be outside.
- + **Staff Experience** – Comfort, enabling early mobilisation, safe patient transfers, easy of use, manoeuvre, clean.





How Sydney
GoFlat has helped



Enabled increased function of a critical RTC survivor



Enabled increased function of a critical RTC survivor



Enabled increased function of a critical RTC survivor

- + Patient able to engage with friends and family, spend time outside, to sit in more upright position to eat a meal.
- + Patient had control of remote and reported that it gave meaning and purpose to her day.
- + Patient progressed to sitting in a standard chair.
- + Patient described the Chair as “Life Changing” and the “Highlight of year so far.”

Matilda, OT, Sydney – Australia

Enabled the mobilisation of a neuro trauma patient



Enabled the mobilisation of a neuro trauma patient

- + Patient was unable to mobilise and had been in bed for 3 months, had very fragile skin.
- + Patient had difficulty with transfers between bed and chair due to severe deconditioning.
- + Hoisted, but “removal of the sling would be very difficult largely due to her size.”
- + Patient was transferred via Pat Slide and able to sit out daily for up to 3 hours.

Improved quality of life for a palliative patient



Improved quality of life for a palliative patient

- + Patient had a Spinal Cord Injury, progressive disease, unsuitable for hoisting.
- + Lateral transfer to Sydney GoFlat chair.
- + Gave patient control of positioning.
- + Allowed access to hospital garden.

Matilda, OT, Sydney – Australia

Enabled sitting for a severe burns unit patient



Enabled sitting for a severe burns unit patient

- + Patient suffered burns to 80% body, multiple skin grafts and infections and in severe pain, lifter and hoist not an option.
- + Using the HoverMatt, patient was able to transfer to the Sydney and used the chair daily for almost 2 weeks.

OT – Australia

Tracheostomy Patient with LD



Enabled sitting for an ICU patient with a tracheostomy

The image displays three calendar grids for the months of April, May, and June. Each grid shows the days of the week (Su, Mo, Tu, We, Th, Fr, Sa) and the dates. Red 'X' marks are placed over specific dates in each grid, indicating when sitting was enabled for an ICU patient with a tracheostomy. The 'X' marks are present on the following dates:

- April:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.
- May:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31.
- June:** 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30.

Tracheostomy Patient with LD

- + Spent months in ICU
- + Previously unable to sit up or leave the room.

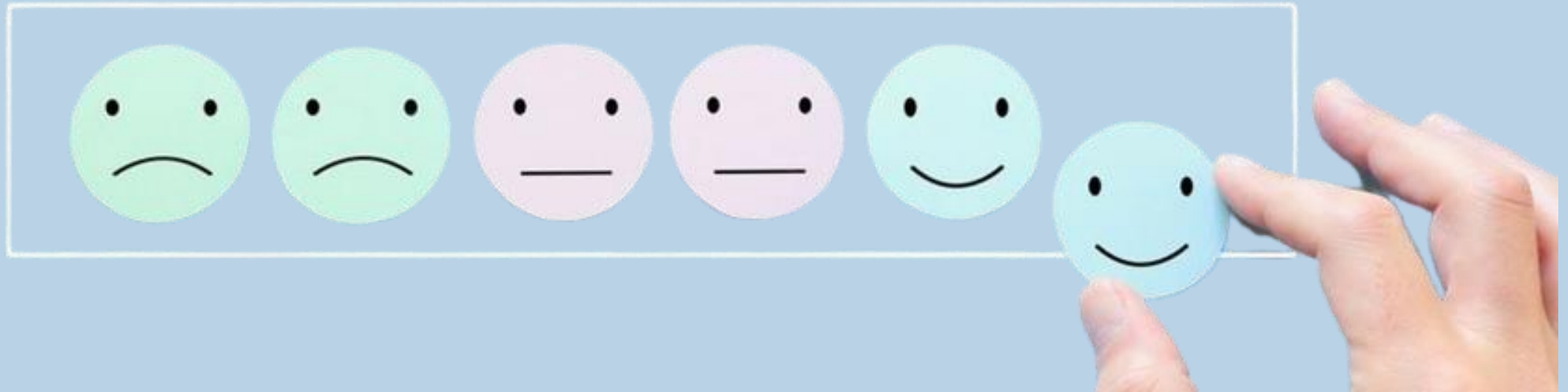
- + With Sydney GoFlat, transferred using ceiling hoist
- + Able to sit up be moved outside to aid recovery
- + First time outdoors in 80 days spending time with her family
- + Said it “Was comfortable” and that it “was lovely”

Susie, Gateshead Health NHS Foundation Trust– UK

Safety Benefits

- + The Sydney Go Flat makes it easier and safer to transfer a patient with a tracheostomy.
- + When weaning a patient off the ventilator, with a tracheostomy, lateral transfer movement is easier to tolerate.
- + Preventing dislodgement or moving of the tracheostomy.

Psychological Benefits



Psychological Benefits

- + Visible progress is seen on transfer from the bed to the Sydney Go Flat
- + Outside vs Indoors
- + Progress, regain normality
- + “Delighted to see the sky, feel the air on their face, and see daylight.”
- + Practice sit to stand much easier than from the bed.
- + Helping reset day and night rhythm.

Susie, Gateshead Health NHS Foundation Trust– UK

Psychological Benefits

- + What is torture?
- + Remove stimulation, subjected to noise, deprived of natural light
- + “Gave permission to be human again”

David McWilliams





Gateshead Health
NHS Foundation Trust

Product Trial

- + Gateshead Health NHS Foundation Trust trial scored greater than 8/10 across key measures.
- + All HCPs thought it met the needs of critical care patients and would like the chair in the unit.



Westmead Health Precinct

Westmead Innovation Centre



Health
Western Sydney
Local Health District



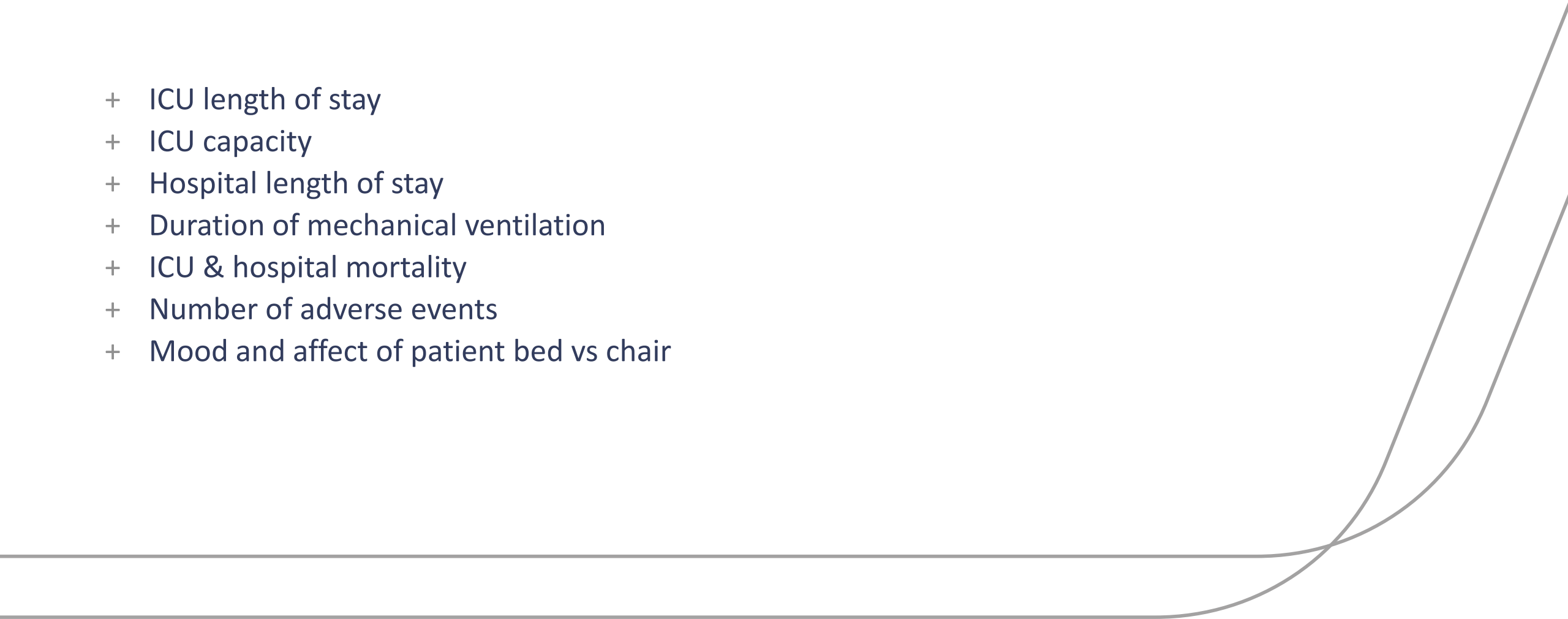


Westmead ICU Research – Sydney

- + Early mobilisation aid for ventilator-dependent patients
- + Primary outcome measure - time to ICU Mobility Scale number 3 'Sitting over edge of bed', from initiation of mechanical ventilation.



Westmead ICU Research – Sydney

- + ICU length of stay
 - + ICU capacity
 - + Hospital length of stay
 - + Duration of mechanical ventilation
 - + ICU & hospital mortality
 - + Number of adverse events
 - + Mood and affect of patient bed vs chair
- 

Positive patient experience

- + Comfortable in the chair and being out of bed.
- + Enjoy being able to use remote control to reposition.
- + Functional benefits: eating and drinking in the chair.
- + Psychological benefits: communicating, socialising with friend / family, moved outside.

Positive staff experience

- + Patients appear very comfortable and benefit from tilt in space.
- + Enabling early mobilisation of a broad range of ICU patients, including myopathic, de-conditioned patients.
- + More efficient / less staff required for lateral transfers vs. hoisting.
- + Lateral transfer is an option for certain patients who cannot be hoisted.
- + Drop down arms assist with hoisting as well as lateral transfers.

Summary

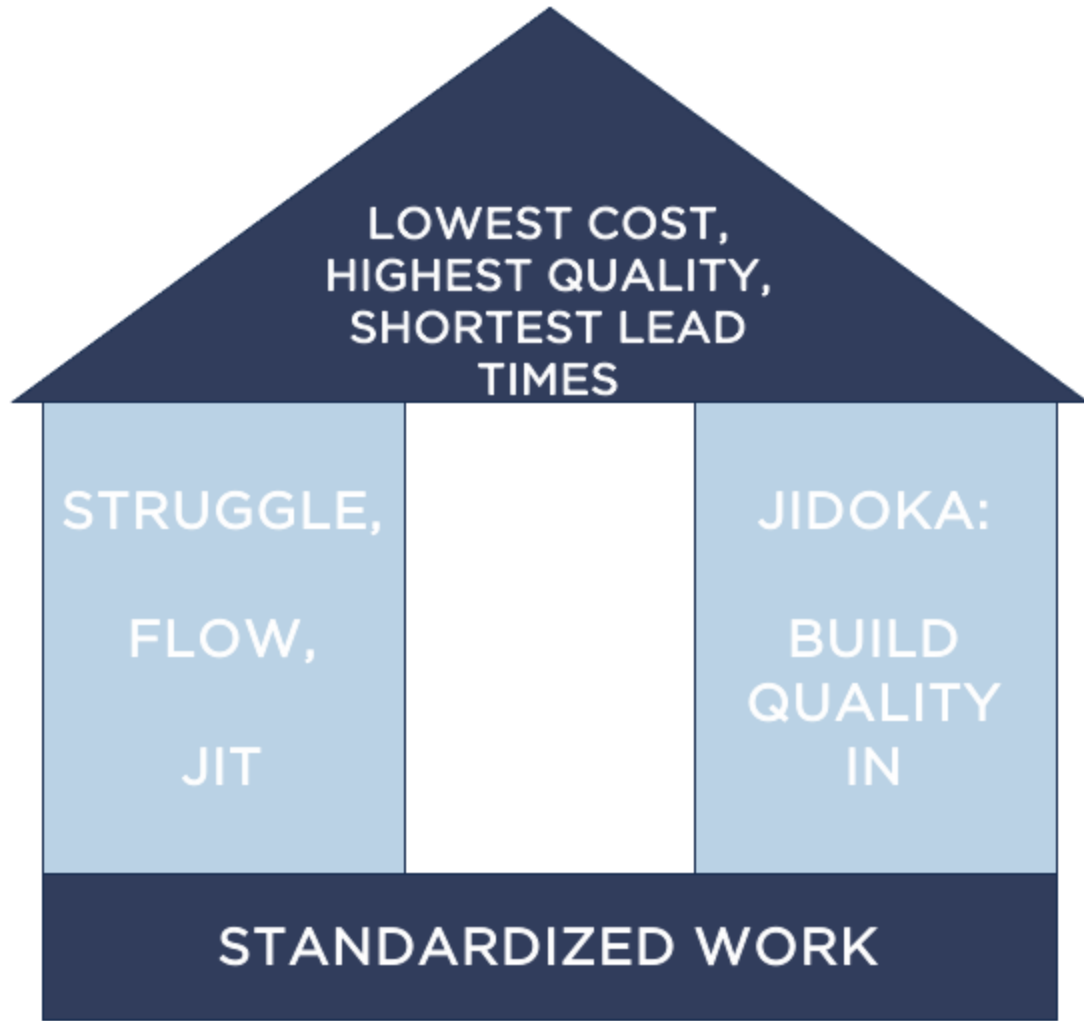
Clinical seating can assist in early mobilisation & rehabilitation

- + ICU-Acquired Weakness is common among ICU survivors.
- + Early mobilisation has shown benefits in muscle strength and Physical function and trends towards improving patient outcomes.
- + Having the necessary assistive equipment is a best practice. strategy to optimise early mobilisation and rehabilitation.
- + Sitting in bed and in chairs is the first step to recovery from critical illness.

Summary

The Sydney GoFlat can assist in early mobilisation & rehabilitation

- + The Sydney GoFlat™ is an important option in early mobilisation and safe patient handling.
- + Confidence
- + Reliable, repeatable result
- + Earlier
- + Patient Experience - Comfort, Getting Patient Out of Bed, Self Reposition, Enabling Function, Enabling to be Outside.
- + Staff Experience – Comfort, Enabling Early Mobilisation, Safe Patient Transfers, Easy of use, Manoeuvre, Clean.



Just In Time



Personalised Service



Phoenix 2



Sorrento 2

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