Achieving Evidence Based Outcomes of Patient Mobility & Pressure Injury Prevention While Preventing Caregiver Injury

Kathleen M Vollman, MSN, RN, CCNS, FCCM, FAAN
Clinical Nurse Specialist/Consultant
ADVANCING NURSING LLC
kvollman@comcast.net
www.vollman.com

PMR #26044

Disclosures

- Consultant-Michigan Hospital Association Keystone Center
- Consultant/Faculty for CUSP for MVP—AHRQ funded national study
- Subject matter expert CAUTI, CLABSI, HAPU, Safety culture
- Consultant and speaker bureau for Sage Products LLC
- Consultant and speaker bureau for Hill-Rom Inc
- Consultant and speaker bureau for Eloquest Healthcare

Disclaimers

- This presentation was developed with Stryker's Sage business.
- The activities described in this presentation will be provided by an employee/consultant of Stryker.
- This presentation may cover clinical topics for which Sage product offerings may not align.
- Do not distribute, copy, or otherwise utilize without permission.
- The information provided may include evidence-based clinical education and/or Stryker product information.
- No off-label information will be presented.
- Stryker is accredited as a provider of continuing education in nursing by the California Board of Registered Nursing (provider number CEP 15927).
- Stryker designates this educational activity for 1 contact hour of continuing nursing education credit.

Objectives

1. Discuss transforming a culture that creates safety for the patient and staff while achieving evidence-based outcomes
2. Outline evidence-based prevention strategies for incontinence-associated dermatitis, friction reduction, and pressure injury prevention
3. Describe key care process changes that lead to a successful reduction of skin injury and prevent healthcare worker injury

Changing Culture-Critical to Success

- “Culture does not change because we desire to change it. Culture changes when the organization is transformed; the culture reflects the realities of people working together every day."
  - Frances Hesselbein

The Key to Cultural Transformation, Leader to Leader (Spring 1999

Culture of Safety

- Safety is avoiding both short- and long-term harm to people resulting from unsafe acts and preventable adverse events.
- Current infrastructure “silos” safety programs, creating one for patients, another for workers, and yet another for others who may be at risk . (Quality department, Risk Management, Employee Health, SPH)
- The organizational culture, principles, methods, and tools for creating safety are the same, regardless of the population whose safety is the focus.
- A true culture of safety—and the organization leaders who create and sustain it—will not be considered legitimate and genuine if the culture excludes some groups within the organization.

Health Work Environment

Just Culture of Safety

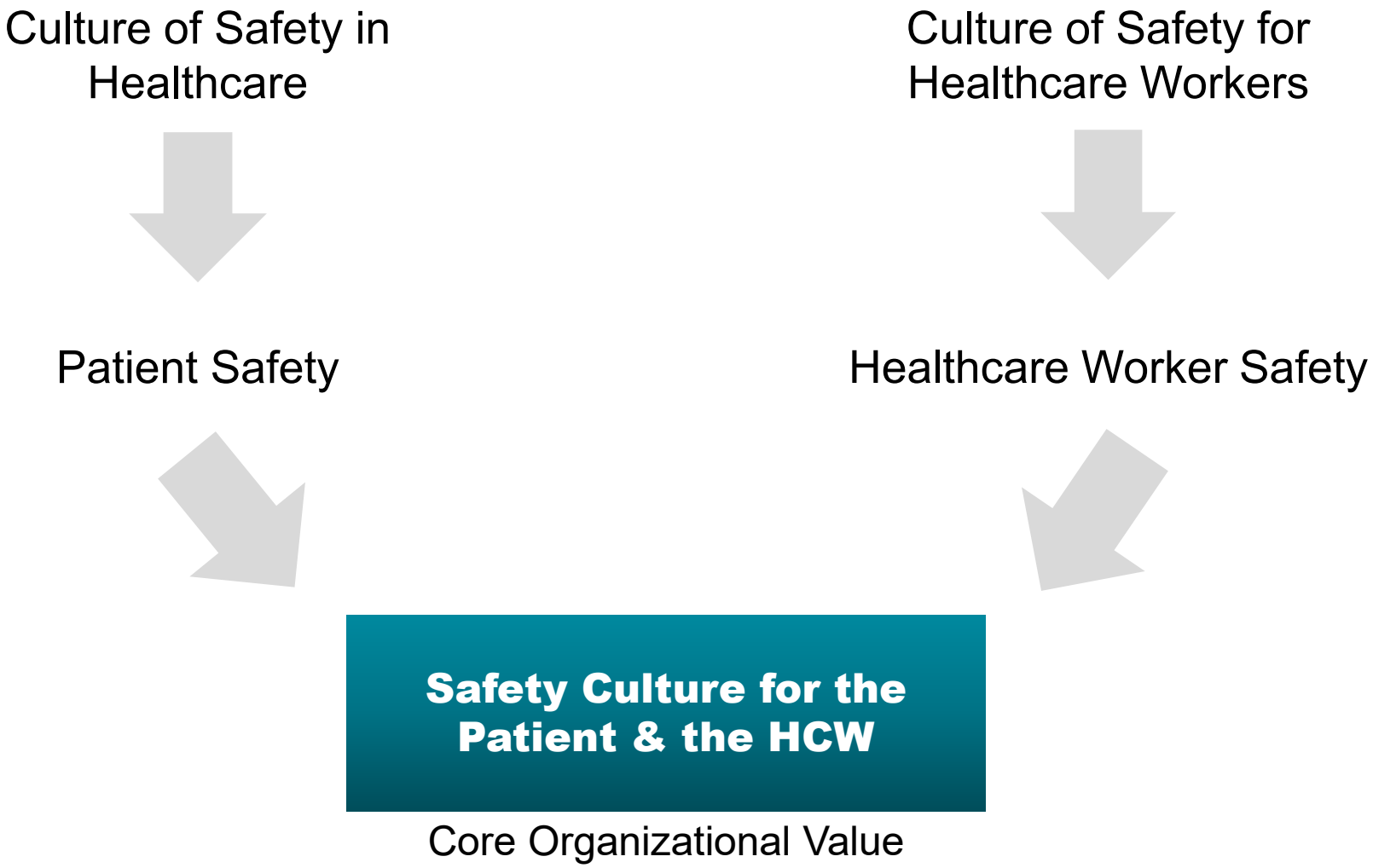
Comprehensive Unit Safety Program (CUSP)

Safe Patient Handling Program

The Joint Commission. Improving Patient and Worker Safety: Opportunities for Synergy, Collaboration and Innovation. Oakbrook Terrace, IL: Nov 2012. http://www.jointcommission.org/.

What does it mean to be in a safe culture for you & your patient?

Changing the Paradigm

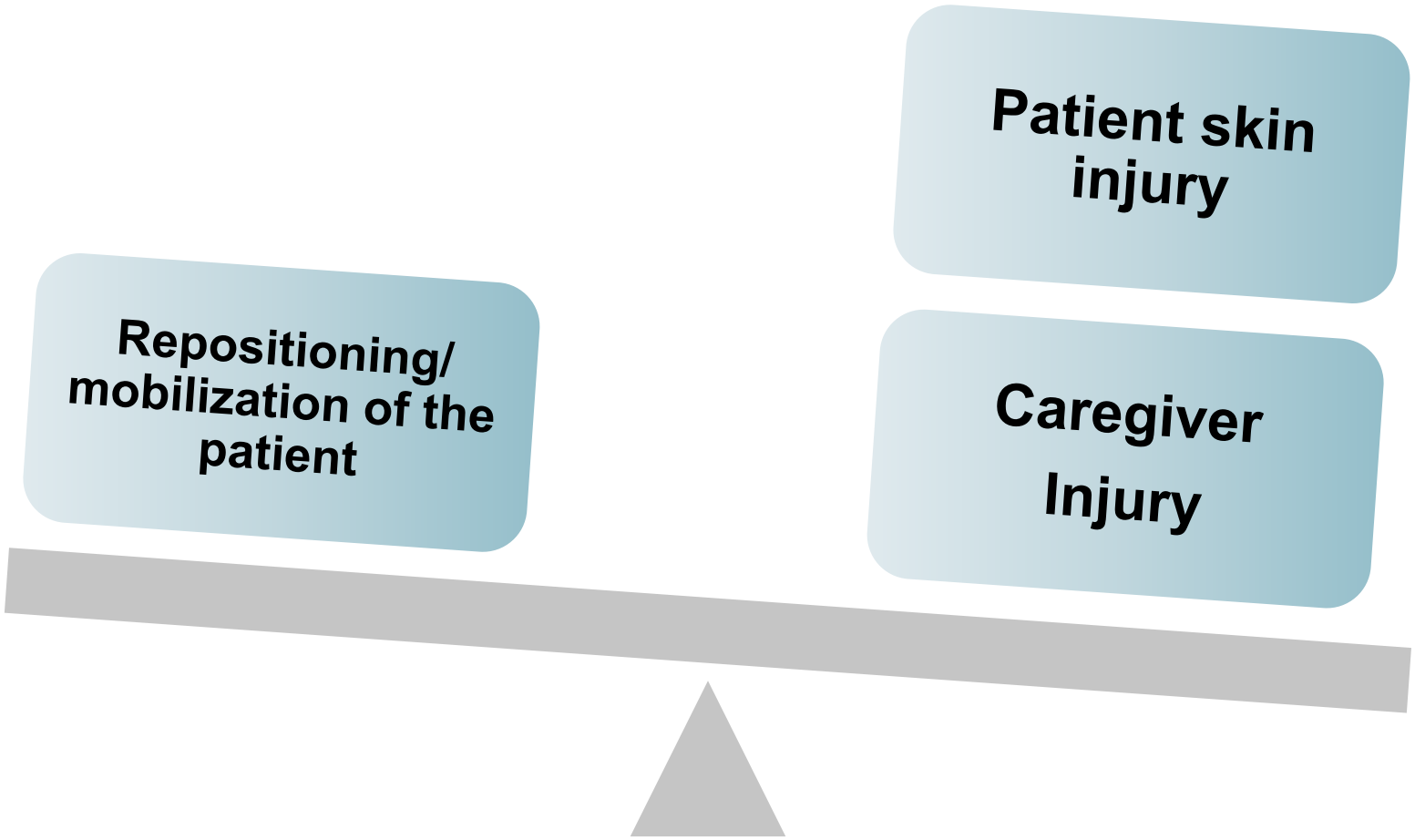


The Goal: Patient & Caregiver Safety

Black J, et al. Crit Care Nurs Q. 2018;41(3):226-239.

How well are we doing?

The Goal: Patient & Caregiver Safety



Cumulative Impact on Quality of Life

- “New Walking Dependence” occurs in 16-59% in older hospitalized patients[1]
- 65% of patients had a significant functional mobility decline by day 2[1]
- 27% still dependent in walking 3 months post discharge[2]

1.Hirsh 1990, Lazarus 1991, Mahoney 1998
2.Mahoney 1998

Skeletal Muscle Deconditioning

- Skeletal muscle strength reduces 4-5% every week of bed rest (1-1.5% per day) – recently seen as high as 3-11% for each day in bed
- Without activity the muscle loses protein
- Healthy individuals on 5 days of strict bed rest develop insulin resistance and microvascular dysfunction
- 2 types of muscle atrophy
  - Primary: bed rest, space flight, limb casting
  - Secondary: pathology
- 40 ICU patients, 2,646 observations, patients spent 100% median time in bed, with 99% little or no activity (2017)
- One day of bed rest requires two weeks of reconditioning to restore baseline muscle strength

1. Siebens H, et al, J Am Geriatr Soc 2000;48:1545-52
2. Topp R et al. Am J of Crit Care, 2002;13(2):263-76
3. Wagenmakers AJM. Clin Nutr 2001;20(5):451-4
4. Fan E, et al. Crit Care Med, 2014;42:849-859
5. Connolly BA. J of Intensive Care Med, 2017; Jan 1:885066617716377
6. Candow DG, Chilibick PD J Gerontol, 2005:60A:148-155
7. Berg HE., et al. J of Appl Physiol, 1997;82(1):182-188
8. Homburg NM,. Arterioscler Thrombo Vasc Biol, 2007;27(12):2650-2656

Do We Even Achieve the Minimum Mobility Standard...

"Q2 Hours.."?

Body Position: Clinical Practice vs. Standard

- Methodology
  - 74 patients/566 total hours of observation
  - 3 tertiary hospitals
  - Change in body position recorded every 15 minutes
  - Average observation time 7.7 hours
  - Online MD survey
- Results
  - 49.3% of observed time no body position change
  - 2.7% had a q 2 hour body position change
  - 80-90% believed q 2 hour position change should occur but only 57% believed it happened in their ICU

Krishnagopalan S. Crit Care Med 2002;30:2588-2592

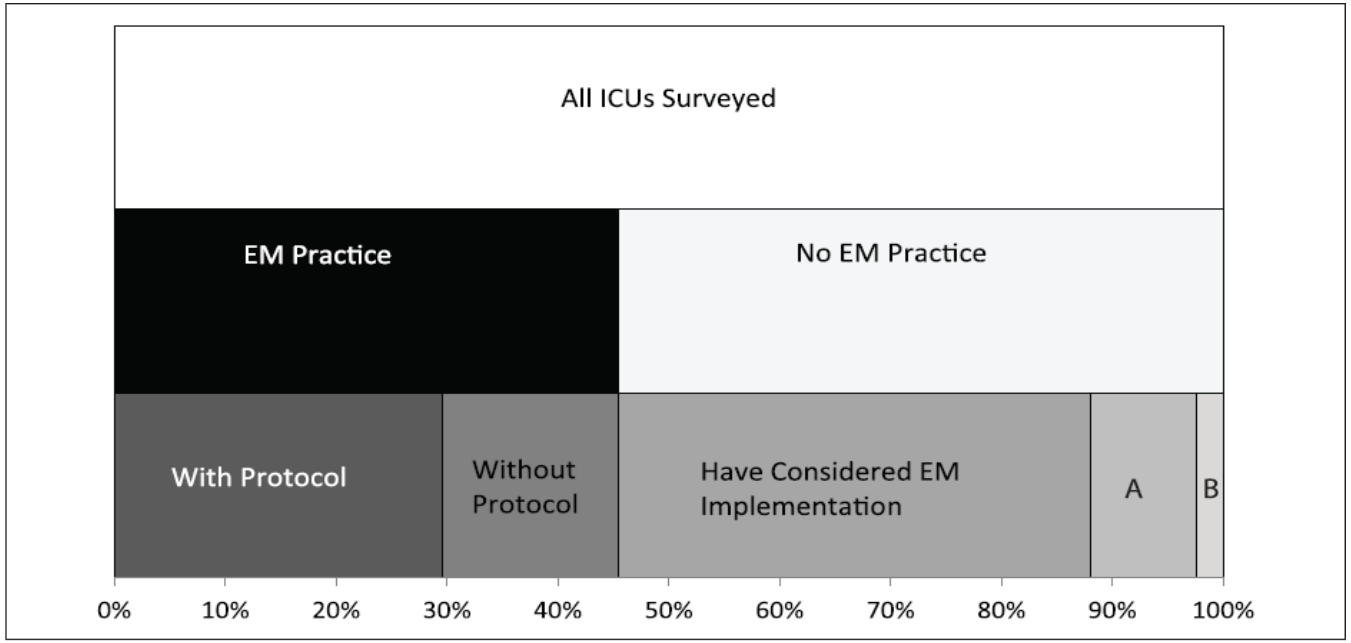
Positioning Prevalence

- Methodology
  - Prospectively recorded, 2 days, 40 ICUs in the UK
  - Analysis on 393 sets of observations
  - Turn defined as supine position to a right or left side lying
- Results:
  - 5 patients prone at any time, 3.8% (day 1) & 5% (day 2) rotating beds
  - Patients on back 46% of observation
  - Left 28.4%
  - Right 25%
  - Head up 97.4%
  - Average time between turns 4.85 hrs (3.3 SD)
  - No significant association between time and age, wt, ht, resp dx, intubation, sedation score, day of wk, nurse/patient ratio, hospital

Goldhill DR et al. Anaesthesia 2008;63:509-515

Environmental Scan of EM Practices

- 687 randomly selected ICU's stratified by regional density & size - 500 responded (73% response rate)
- Demographics:
  - 51% academic affiliation, 58% mixed medical/surgical or 22% medical, with a median of 16 beds (12–24)
  - 34% dedicated PT or OT for the ICU
  - Performed a median of 6 days, 52% began on admission



Factors associated with EMP:

- Dedicated PT/OT
- Written sedation protocol
- Daily MDR
- Daily written goals

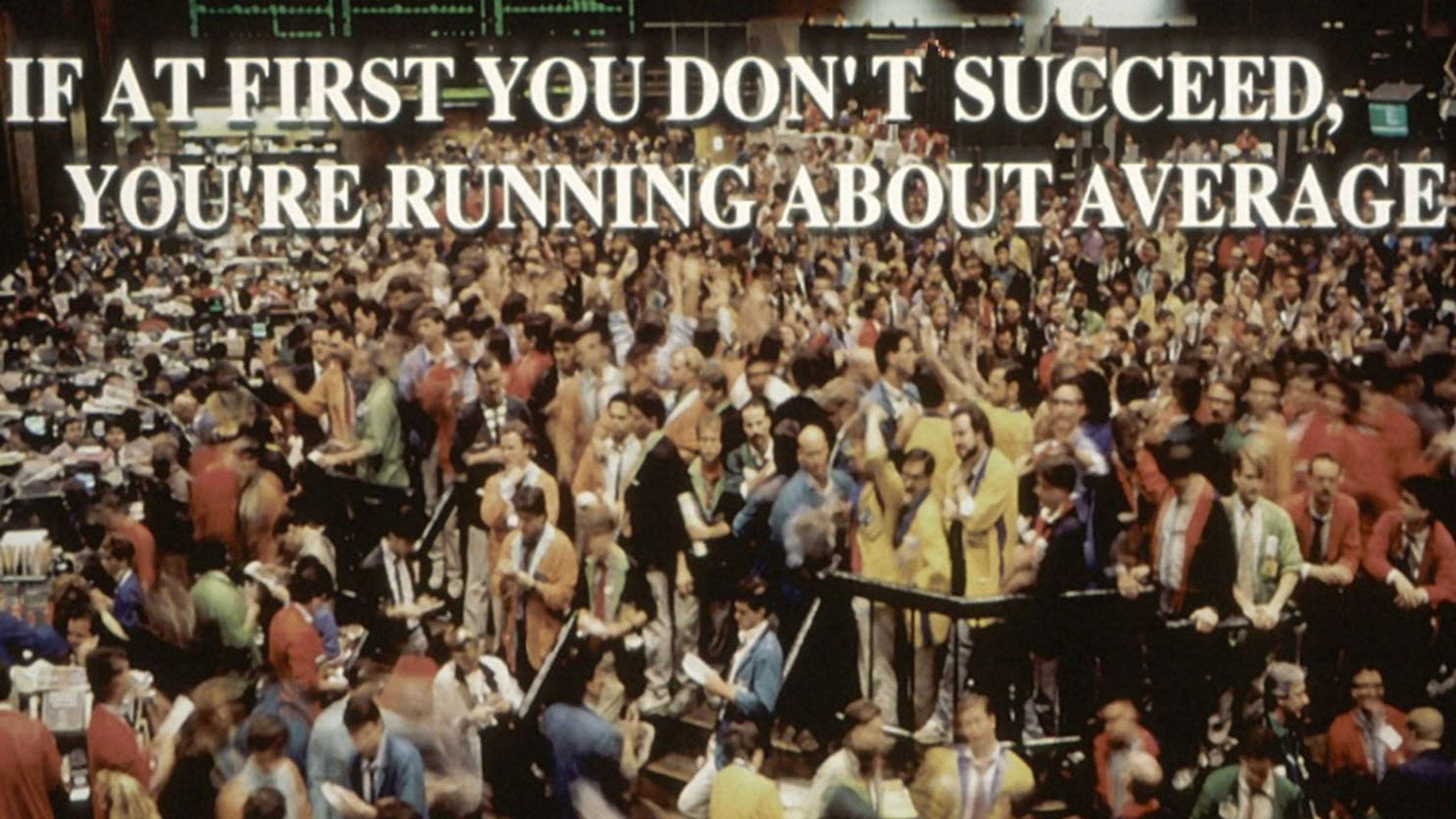
Bakhru RN, et al. Crit Care Med 2015; 43:2360–2369

Outcomes of Early Mobility Programs

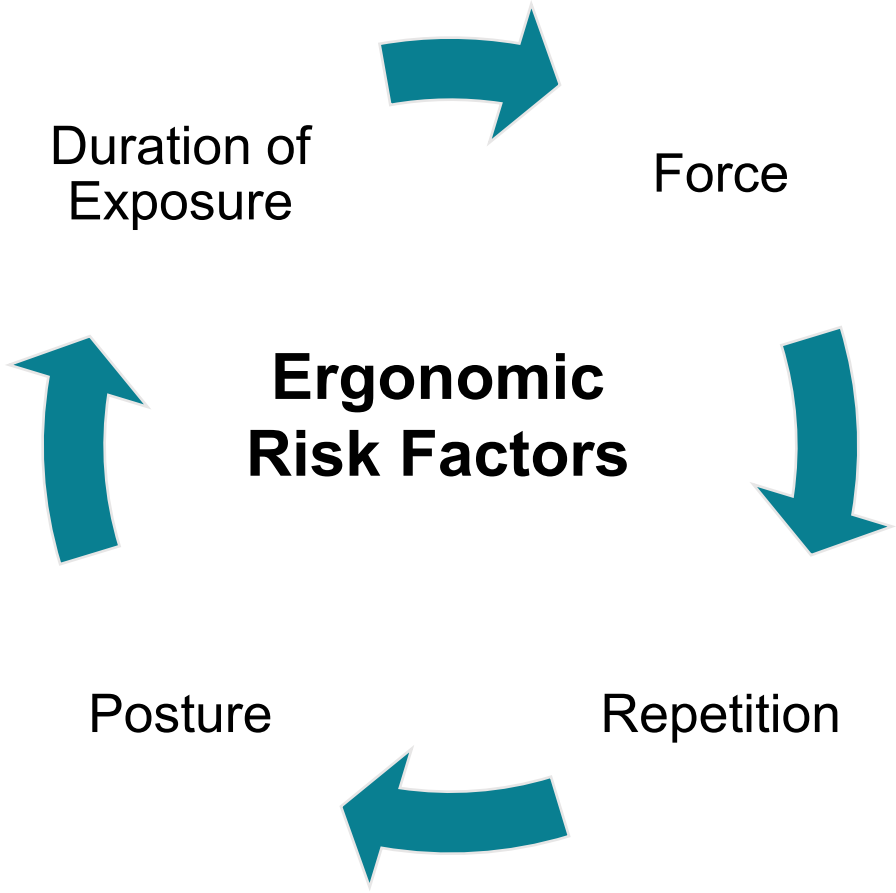
- ↓ incidence of VAP
- ↓ time on the ventilator
- ↓ days of sedation
- ↓ incidence of skin injury
- ↓ delirium
- ↑ ambulatory distance
- Improved function
- ↓ in hospital readmissions
- ↓ ICU & hospital LOS

Staudinger t, et al. Crit Care Med, 2010;38.
Abroung F, et al. Critical Care, 2011;15:R6
Morris PE, et al. Crit Care Med, 2008;36:2238-2243
Pohlman MC, et al. Crit Care Med, 2010;38:2089-2094
Schweickert WD, et al. Lancet, 373(9678):1874-82.

Thomsen GE, et al. CCM 2008;36;1119-1124
Winkelman C et al, CCN,2010;30:36-60
Azuh O, et al. The American Journal of Medicine, 2016, doi:10.106/jmjmed.2016.03.032
Corcoran JR, et al. PMR J, 2016 in press


IF AT FIRST YOU DON'T SUCCEED,
YOU'RE RUNNING ABOUT AVERAGE

What are Ergonomic Risk Factors?



Oh, my aching back!

- Back pain incidence in nursing:
  - 8 out of 10 nurses work despite experiencing musculoskeletal pain[1]
  - 62% of nurses report concern regarding developing a disabling musculoskeletal injury[1]
  - 56% of nurses report musculoskeletal pain made worse by their job[1]
  - Nursing assistants and RNs experience the highest rate of non-fatal occupational injuries and illnesses of ANY industry sector (including manufacturing and construction)[2]

1. American Nurses Association. (2013). ANA Health and Safety Survey. Retrieved from http://www.nursingworld.org/MainMenuCategories/WorkplaceSafety/Healthy-Work-Environment/Work-Environment/2011-HealthSafetySurvey.html

2. U.S. Department of Labor, Bureau of Labor Statistics. (2014). Table 16. Number, incidence rate, and median days away from work for nonfatal occupational injuries and illnesses involving days away from work and musculoskeletal disorders by selected worker occupation and ownership, 2014. Retrieved from http://www.bls.gov/news.release/osh2.t16.htm

Contributing Factors to Injury

- Healthcare is the only industry that considers 100 pounds to be a “light” weight
- Other professions use assistive equipment when moving heavy items
- On average, nurses and assistants lift 1.8 tons per shift[1]

American Nurses Association. (n.d.). Safe Patient Handling Movement. Retrieved from http://nursingworld.org/DocumentVault/GOVA/Federal/Federal-Issues/SPHM.html

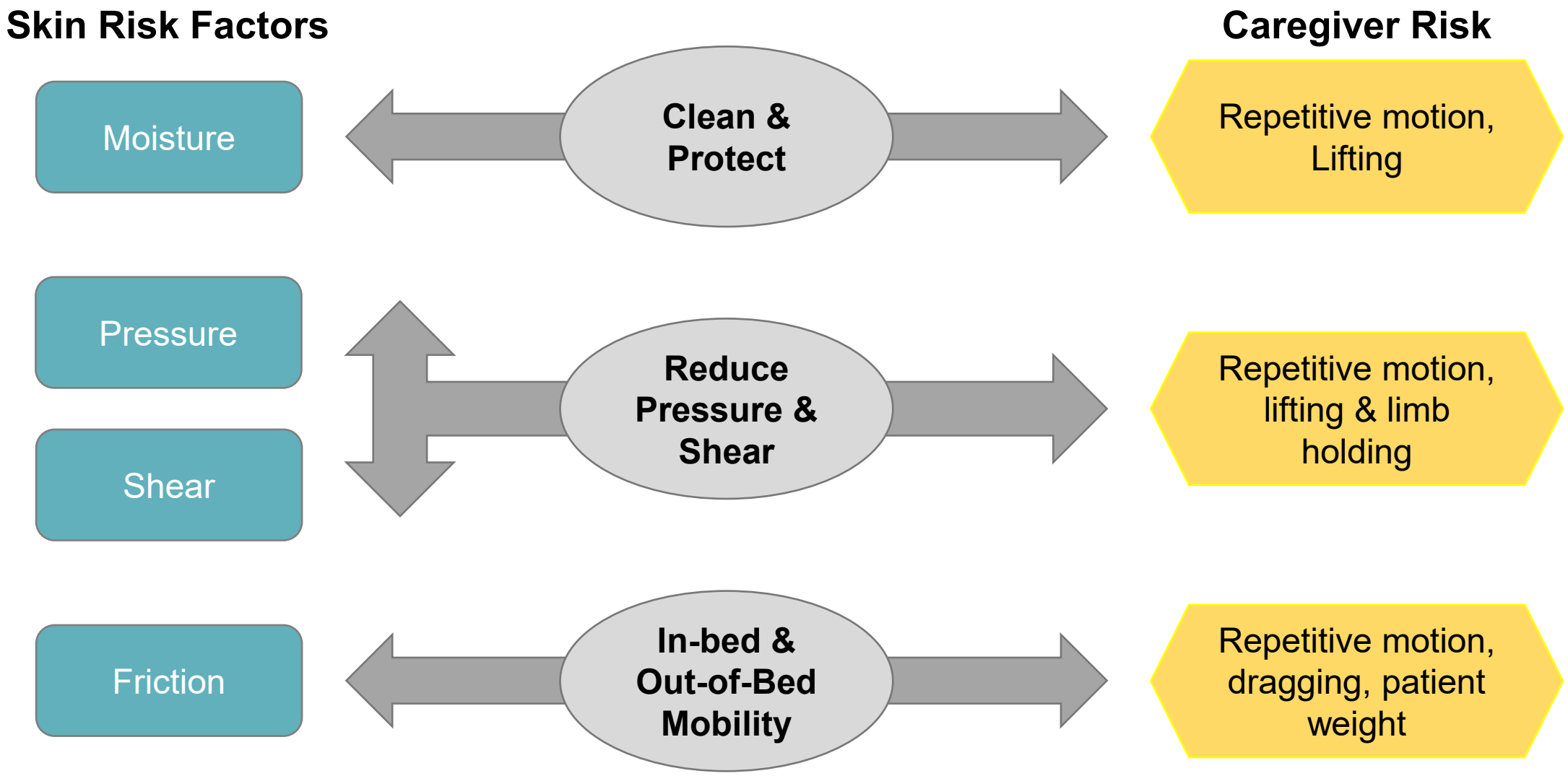
Number, Incidence Rate, & Median Days Away From Work for Occupational Injuries RN's with Musculoskeletal Disorders in US, 2003 – 2014

Year	Ownership	Occupation	Total Cases	Incidence Rate	Medial Days Away from Work
2009	Private Industry	RN's	8,760	51.6	8
2010	Private Industry	RN's	9,260	53.7	6
2011	Private Industry	RN's	10,210		8
2012	Private Industry	RN's	9,900	58.5	8
2013	Private Industry	RN's	9,820	56.2	7
2014	Private Industry	RN's	9,820	55.3	9
2014	Private Industry	NA	18,510		6
2005	Private Industry	RN's	9,060	-	7
2004	Private Industry	RN's	8,810	-	7
2003	Private Industry	RN's	10,050	-	6

* Incidence rate per 10,000 FTE

Bureau of Labor Statistics, U.S. Department of Labor, February 14, 2011. Numbers for local and state government Unavailable prior to 2008/Nov 2011, Release 10:00 a.m. (EST) Thursday, November 8, 2012, 2013 data http://www.bls.gov/news.release/pdf/osh2.pdf. Accessed 01/07/2016 http://www.bls.gov/news.release/pdf/osh2.pdf

Skin & Immobility Prevention Strategies



The Goal:
Patient and Caregiver Safety

Black J, et al. Crit Care Nurs Q. 2018;41(3):226-239.

Patient Progressive Mobility

Early Physical and Occupational Therapy in Mechanically Ventilated Patients

- Prospective randomized controlled trial from 2005-2007
- 1,161 screen, 104 patients mechanically ventilated < 72hrs, functionally independent at baseline met criteria
- Randomized to:
  - Early exercise of mobilization during periods of daily interruption of sedation (49 pts)
  - Daily interruption of sedation with therapy as ordered by the primary care team (55 pts)
  - Primary endpoint: number of patients returning to independent functional status at hospital discharge able to perform activities of daily living and walk (independently)

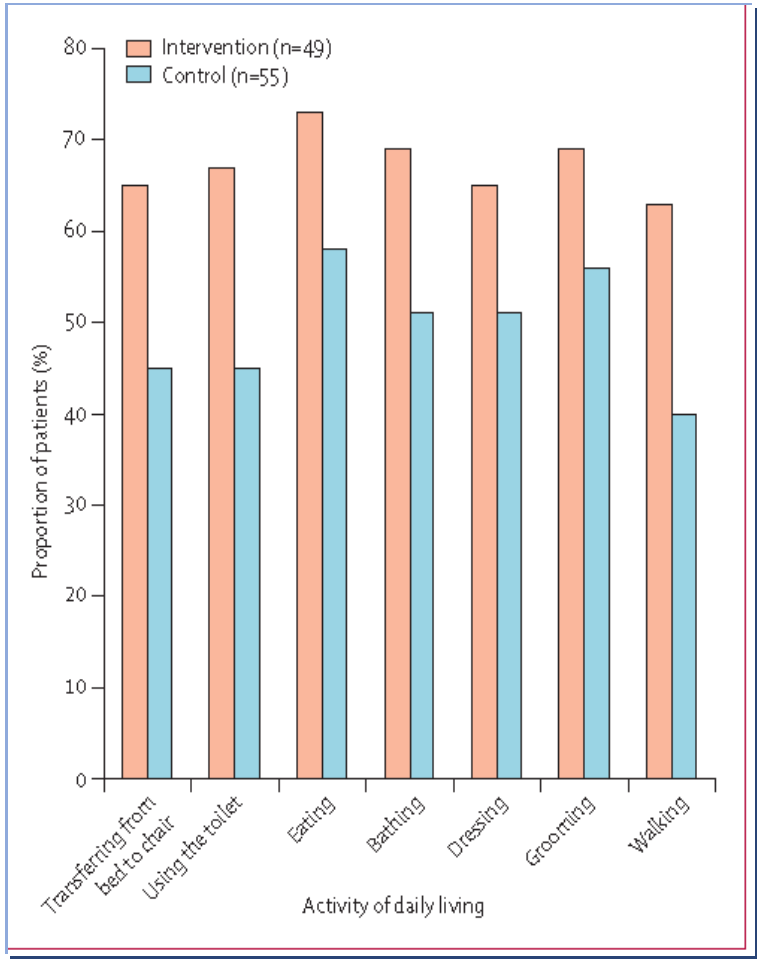
Schweickert WD, et al. Lancet, 373(9678):1874-82.

Early Physical and Occupational Therapy in Mechanically Ventilated Patients

	Intervention (n=49)	Control (n=55)	p value
Time from intubation to first PT/OT session (days)	1·5 (1·0–2·1)	7·4 (6·0–10·9)	<0·0001
Independent ADLs total at ICU discharge	3 (0–5)	0 (0–5)	0·15
Independent ADLs total at hospital discharge	6 (0–6)	4 (0–6)	0·06
MRC examination score at hospital discharge	52 (25–58)	48 (0–58)	0·38
Hand-grip strength at hospital discharge (kg-force)	39 (10–58)	35 (0–57)	0·67
Greatest walking distance at hospital discharge (m)	33·4 (0–91·4)	0 (0–30·4)	0·004
Time from intubation to milestones achieved (days)			
Out of bed	1·7 (1·1–3·0)	6·6 (4·2–8·3)	<0·0001
Standing	3·2 (1·5–5·6)	6·0 (4·5–8·9)	<0·0001
Marching in place	3·3 (1·6–5·8)	6·2 (4·6–9·6)	<0·0001
Transferring to a chair	3·1 (1·8–4·5	6·2 (4·5–8·4)	<0·0001
Walking	3·8 (1·9–5·8)	7·3 (4·9–9·6)	<0·0001

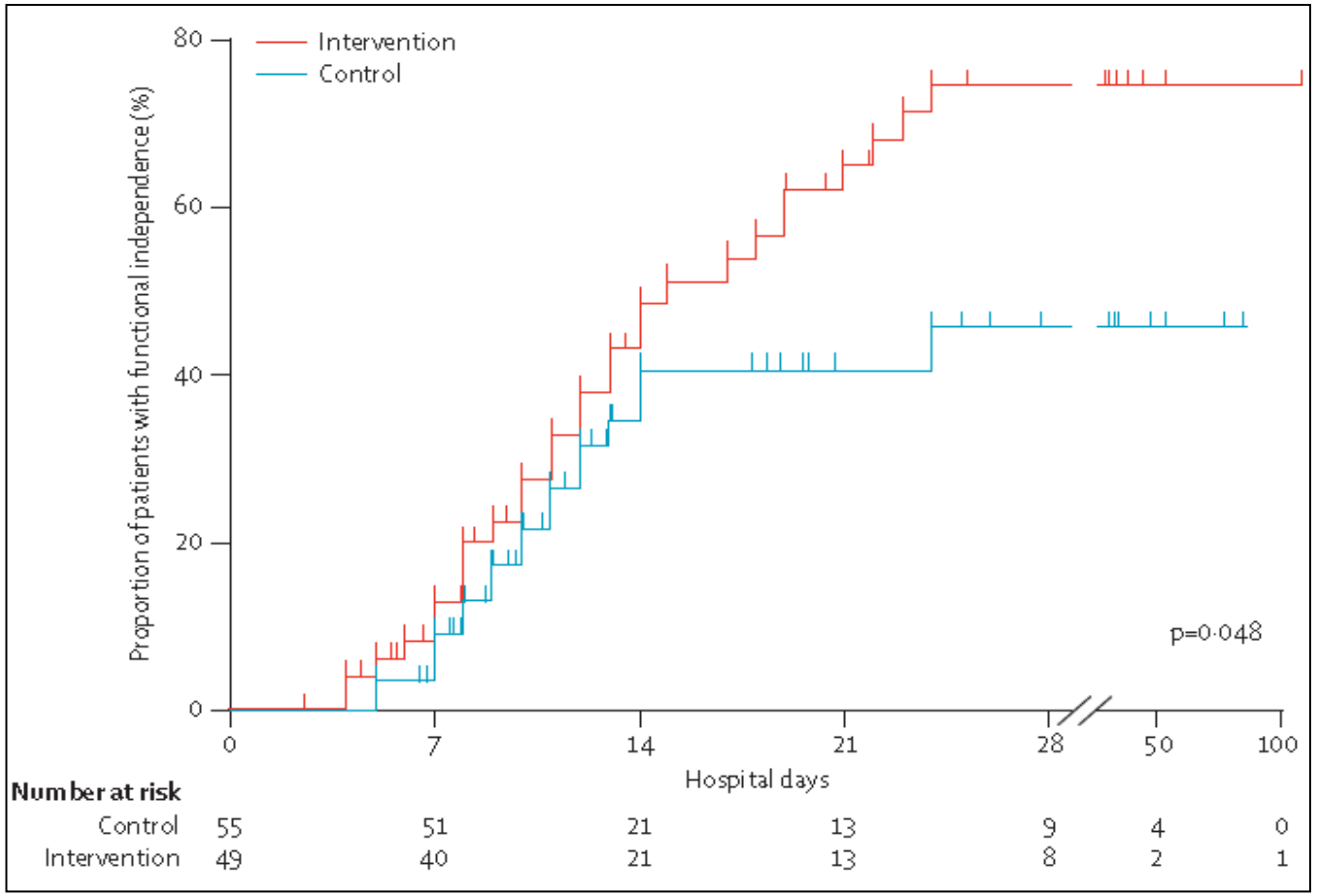
Data are median (IQR). ADLs=activities of daily living. ICU=intensive care unit. MRC=Medical Research Council. PT/OT=physical therapy and occupational therapy. MRC examination scale 0–60.

Table 4: Function and muscle strength outcomes according to study group



Schweickert WD, et al. Lancet, 373(9678):1874-82.

Early Physical and Occupational Therapy in Mechanically Ventilated Patients

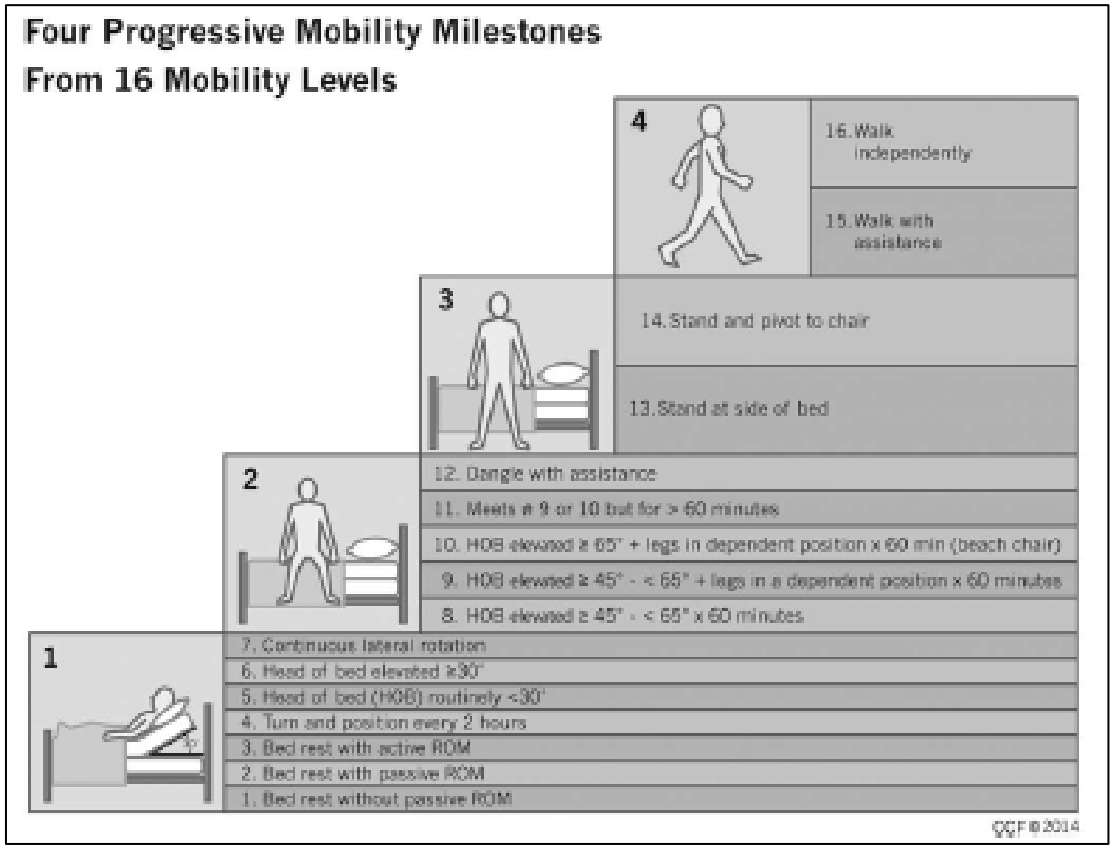


- Safe
- Well tolerated
- ↓ duration of delirium
- ↑ VFD
- Functional independence at discharge 59% protocol group vs. 35% in control arm

Schweickert WD, et al. Lancet, 373(9678):1874-82.

Protocol Driven Mobility Program: Impacting Neurological Outcomes

- Pre-post intervention study
- Large academic NICU
- 637 patients
  - 260 pre
  - 377 post
- Intervention: Early Progressive Mobility Protocol
  - Exclusion criteria
  - Readiness criteria
  - Started on admission
  - Encouraged to use ICU bed features & lifts to assist
  - Protocol placed at bedside



Klein K, et al. Crit care Med, 2015, epub

Protocol Driven Mobility Program: Impacting Neurological Outcomes

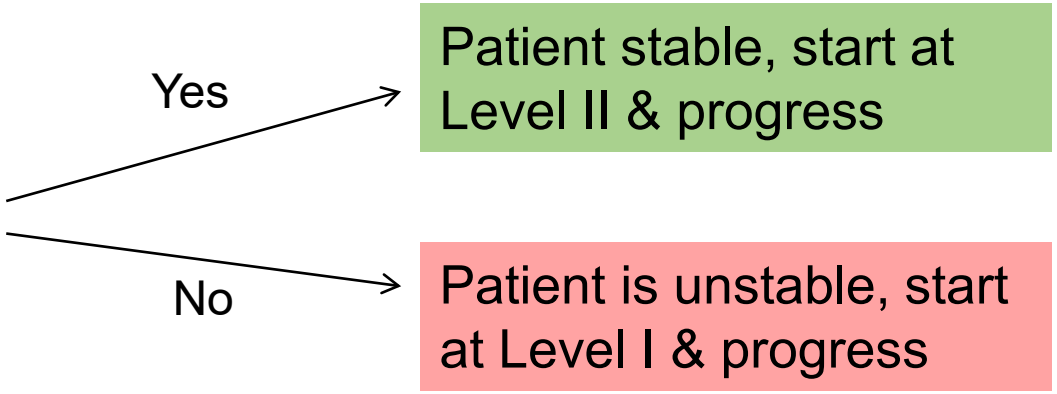
Multivariate analysis done to control for group differences:

Factor	Adjusted Model Mean (SEM)		p
	Preintervention	Postintervention	
Acute Physiology and Chronic Health Evaluation III score[b]	59.0 (2.64)	58.7 (2.54)	0.90
Length of stay			
Hospital, d (SD)	15.16 (0.96)	10.21 (1.04)	< 0.001
Neurologic ICU, d (SD)	7.37 (0.68)	4.75 (0.64)	< 0.001
Psychologic factors			
Depression, mean (SD)	0.76 (0.22)	0.51 (0.22)	0.12
Anxiety, mean (SD)	0.69 (0.21)	0.42 (0.21)	0.088
Hostility, mean (SD)	0.38 (0.14)	0.27 (0.14)	0.31
Combined, mean (SD)	1.80 (0.50)	1.21 (0.48)	0.11
Factor	**Postintervention Odds Ratio (95% CIs)**		**p**
Highest mobility achieved			
> Level 7[c]	1.63 (1.16, 2.33)		0.005
3 levels[d]	1.92 (1.43, 2.58)		< 0.001
4 levels[e]	1.78 (1.32, 2.41)		< 0.001
Mortality, 30 d	0.96 (0.58, 1.59)		0.87
Discharge home	1.53 (1.03, 2.27)		0.033
Deep vein thrombosis	1.90 (1.00, 3.60)		0.05
Deep vein thrombosis[f]	1.73 (0.95, 3.15)		0.072
Deep vein thrombosis[g]	1.52 (0.83, 2.80)		0.18

Klein K, et al. Crit care Med, 2015, epub

Determining Readiness

- Perform initial mobility screen w/in 8 hours of ICU admission & daily
  - PaO2/FiO2 ≥ 250
  - Peep <10
  - O2 Sat ≥ 90%
  - RR 10-30
  - No new onset cardiac arrhythmias or ischemia
  - HR >60 <120
  - MAP >55 <140
  - SBP >90 <180
  - No new or increasing vasopressor infusion
  - RASS ≥ -3



Bassett RD, et al.Intensive Crit Care Nurs (2012) 2012 Apr;28(2):88-97
Needham DM, et al. Arch Phys Med Rehabil. 2010 Apr;91(4):536-42

Progressive Mobility Continuum

START HERE

Includes complex, intubated, hemodynamically unstable and stable intubated patients; may include non-intubated

Includes intubated, non intubated hemodynamically stable/stabilizing, no contraindications

Perform Initial mobility screen w/in 8 hours of ICU admission
Reassess mobility level at least every 24 hours (Recommended at shift Δ)

Refer to the following criteria to assist in determining mobility level

- o PaO2/FiO2 ≥ 250
- o Peep <10
- o O2 Sat ≥ 90%
- o RR 10-30
- o No new onset cardiac arrythmias or ischemia
- o HR >60 <120
- o MAP >55 <140
- o SBP >90 <180
- o No new or increasing vasopressor infusion
- o RASS ≥ 3

NO → Start at level I*

YES → Start at level II and progress*

LEVEL I	LEVEL II	LEVEL III	LEVEL IV	LEVEL V
RASS -5 to - 3	RASS -3 & up	RASS -1 & up	RASS 0 & up	RASS 0 & up
Goal: clinical stability; passive ROM	**Goal**: upright sitting; increased strength and moves arm against gravity	**Goal**: Increased trunk strength, moves leg against gravity and readiness to weight bear	**Goal:** stands w/ min. to mod. assist, able to march in place, weight bear and transfer to chair	**Goal:** Increase distance in ambulation & ability to perform some ADLs
	PT consultation prn OT consultation prn	PT: Active Resistance Once a day, strength exercises OT consultation prn	PT x 2 daily OT consult for ADL's	PT x 2 daily & OT x1 daily
ACTIVITY: HOB ≥ 30º *Passive ROM 2X/d performed by RN, or UAP CLRT/Pronation initiated if patient meets criteria based on institutional practice OR Q 2 hr turning	**ACTIVITY:** Q 2 hr turning *Passive /Active ROM 3x/d 1. HOB 45º X 15 min. 2. HOB 45º,Legs in dependant position X 15 min. 3. HOB 65º,Legs in dependant position X 15 min. 4. Step (3) & full chair mode X20 min. 3X/d Or Full assist into cardiac chair 2X/day	**ACTIVITY:** Self or assisted Q 2 hr turning 1.Sitting on edge of bed w/RN, PT, RT assist X 15 min. 2.Progressive bed sitting Position Min.20 min. 3X/d Or Pivot to chair position 2X/d	**ACTIVITY:** Self or assisted Q 2 hr turning 1.Bed sitting Position Min.20 min. 3X/d; 2.Sitting on edge of bed; stand w/ RN, PT, RT assist 3.Active Transfer to Chair (OOB) w/ RN/PT/RT assist Min. 3X/d	**ACTIVITY:** Self or assisted Q 2 hr turning 1.Chair (OOB) w/ RN/PT/RT assist Min. 3X/day 2.Meals consumed while dangling on edge of bed or in chair Ambulate progressively longer distances with less assistance x2 or x3/day with RN/PT/RT/UAP
Tolerates Level I Activities	Tolerates Level II Activities	Tolerates Level III Activities	Tolerates Level IV Activities	

For each position/activity change allow 5-10 minutes for equilibration before determining the patient is intolerant

*****If the patient is intolerant of current mobility level activities, reassess and place in appropriate mobility level*****

***Mobility is the responsibility of the RN, with the assistance from the RT's Unlicensed Assistive Personnel and PT/ OT. PT and OT may assist the team with placement to the appropriate mobility level of activity, *always prioritizing patient and provider safety*. Placement is based on clinical judgment.**

Bassett RD, et al.Intensive Crit Care Nurs (2012) 2012 Apr;28(2):88-97

B.M.A.T. – Banner Mobility Assessment Tool for Nurses

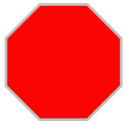
Test	Task	Response	Fail = Choose Most Appropriate Equipment Device(s)	Pass
Assessment Level 1 Assessment of: - Cognition - Trunk Strength - Seated balance	**Sit and Shake:** From a semi-reclined position, ask patient to sit upright and rotate* to a seated position at the side of the bed; *may use bedrail* Note patient's ability to maintain bedside position. Ask patient to reach out and grab your hand and shake making sure patient reaches across his/her midline Note: Consider your parients cognitive ability, including orientation and CAM assessment if applicable	**Sit:** Patient is able to follow commands, has some trunk strength; caregivers may be able to try weight-bearing if patient is able to maintain seated balance greater than two minutes (without caregiver assistance). **Shake:** Patient has significant upper body strength, awareness of body in space, and grasp strength.	**MOBILITY LEVEL 1** - Use total lift: with sling and/or repositioning sheet and/or straps. - Use lateral transfer devices such as roll board, friction reducing (slide sheets, tube), or air assisted device. **NOTE:** *If patient has '**strict bed rest**' or **bilateral 'non-weight bearing'** restrictions **do not proceed** with the assessment; **patient is MOBILITY LEVEL 1.***	Passed Assessment Level 1 = Proceed with Assessment Level 2.
Assessment Level 2 Assessment of: - Lower extremity strength - Stability	**Stretch and Point:** With patient in seated position at the side of the bed, have patient place both feet on the floor (or stool) with knees no higher than hips. Ask patient to stretch one leg and straighten the knee, then bend the ankle/ flex and point the toes. If appropriate, repeat with the other leg.	Patient exhibits upper and lower extremity stability, strength and control. **May test only one leg and proceed accordingly (e.g., stroke patient, patient with ankle in cast).**	**MOBILITY LEVEL 2** - Use total lift for patient unable to weight-bear on at least one leg. - Use sit-to-stand life for patient who can weight-bear on at least one leg.	Passed Assessment Level 2 = Proceed with Assessment Level 3.
Assessment Level 3 Assessment of: - Lower extremity strength for standing	**Stand:** Ask patient to elevate off the bed or chair (seated to standing) using an assistive device (cane, bedrail). Patient should be able to raise buttocks off bed and hold for a count of five. May repeat once. Note: Consider your patients cognitive ability, including orientation and CAM assessment if applicable.	Patient exhibits upper and lower extremity stability and strength. **May test with weight-bearing on only one leg and proceed accordingly (e.g., stroke patient, patient with ankle in cast).** **If any assistive device (cane, walker, crutches) is needed, patient is Mobility Level 3.**	**MOBILITY LEVEL 3** - Use non-powered raising/stand aid; *default to powered sit-to stand lift if no stand aid available.* - Use total lift with ambulation accessories. - Use assistive device (cane, walker, crutches). NOTE: Patient passes Assessment Level 3 **but requires assistive device** to ambulate or **cognitive assessment** includes poor safety awareness; ***patient is MOBILITY LEVEL 3.***	Passed Assessment Level 3 **AND no assistive device needed** = Proceed with Assessment Level 4. ***Consult with Physical Therapist when needed and appropriate.***
Assessment Level 4 Assessment of: - Standing balance - Gait	**Walk:** Ask patient to march in place at bedside. Then ask patient to advance step and return each foot. Patient should display stability while performing tasks. Assess for stability and safety awareness.	Patient exhibits steady gait and good balance while marching, and when stepping forwards and backwards. Patient can maneuver necessary turns for in-room mobility. Patient exhibits safety awareness.	**MOBILITY LEVEL 3** If patient shows signs of unsteady fait or **fails Assessment Level 4** refer back to **MOBILITY LEVEL 3; *patient is MOBILITY LEVEL 3.***	**MOBILITY LEVEL 4** MODIFIED INDEPENDENCE **Passed = No assistance needed to ambulate;** use your best clinical judgement to determine need for supervision during ambulation.

Always default to the safest lifting/ transfer method (e.g., total lift) if there is any doubt in the patient's ability to perform the task.

Boyton T, Am Nurse Today, 2014 suppl

Consensus on Safe Criteria for Active Mobilization

- Systematic review performed; 23 international experts gathered to reach consensus

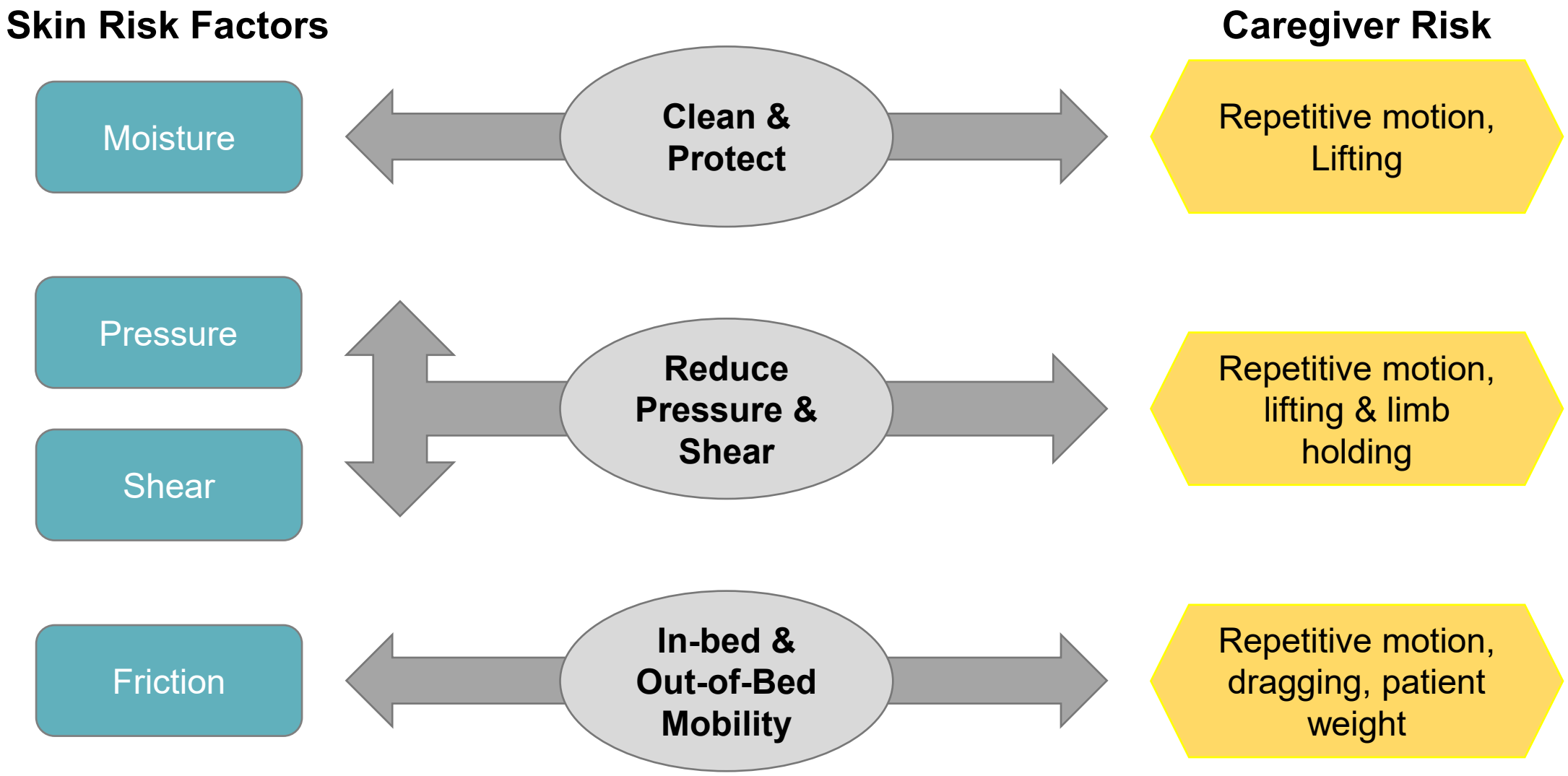
	Low risk of an adverse event. Proceed as usual according to each ICU's protocols and procedures.
	Potential risk and consequences of an adverse event are higher than green, but may be outweighed by the potential benefits of mobilization. The precautions or contraindications should be clarified prior to any mobilization episode. If mobilized, consideration should be given to doing so gradually and cautiously.
	Significant potential risk or consequences of an adverse event. Active mobilization should not occur unless specifically authorized by the treating intensive care specialist in consultation with the senior physical therapist and senior nursing staff.

- Categories:
  - Respiratory, Cardiovascular, Neurological, other considerations.
- Consensus reached on all criteria:
  - If no other contraindications; presence of vasoactives, endotracheal tube, $FIO_2 < 60\%$ with SaO_2 90% & RR < 30/min were considered safe criteria for mobilization

Hodgson CL, et. al Critical Care, 2014;18:658

Achieving In-Bed and Out-of-Bed Mobility While Protecting the Patient and Caregiver

Skin & Immobility Prevention Strategies



Building Resiliency into Interventions

- Forcing Functions and Constraints
- Automation and Computerization
- Standardization and Protocols
- Checklist and Independent Check Systems
- Rules and Policies
- Education and Information
- Vague Warning – “Be More Careful!”

NIOSH (National Institute of Occupational Safety and Health) Recommendations for Safe Patient Handling

- Maximum recommended weight limit set for patient lifting[1]
  - The weight being lifted can be estimated
  - When patient is cooperative
  - The lift is smooth and slow
- Maximum recommended limits set for patient push/pull activity
- Proper body mechanics alone will not prevent patient handling injury[2]
- Safe work practices

It is not safe to manually move patients

National Institute for Occupational Safety and Health
NIOSH

1. Waters, T.R. (2007). When is it safe to manually lift a patient? *American Journal of Nursing, 107*(8), 53-58.
2. Hignett, 2003

What is Safe Patient Handling?

- Manual Patient Handling
  - The transporting or supporting of a patient by hand or bodily force, including pushing, pulling, carrying, holding, and supporting of the patient or a body part.
- Safe Patient Handling
  - Evidence-based approach to reducing risk to caregivers. Includes risk assessment, use of equipment, patient assessment, algorithms, peer safety leaders, and after-action reviews.

Motacki, K., & Menzel, N. (2009). *The Illustrated Guide to Safe Patient Handling and Movement.* New York: Springer.

Evidence-Based Strategies for a Comprehensive Safe Patient Handling and Mobility (SPHM) Program

1. Ergonomic Assessment Protocol
2. Patient Handling Assessment Criteria and Decision Algorithms
3. Peer Leaders
4. State-of-the-Art Equipment
5. After Action Reviews
6. No Lift Policy

Nelson, A.L. (2006). Consequences of unsafe patient handling practices. In A.L. Nelson (Ed.), Safe patient handling and movement : a guide for nurses and other health care providers (pp. 41-46).

EBP Recommendations to Achieve Offloading & Reduce Pressure (A)

- Turn & reposition every (2) hours (avoid positioning patients on a pressure injury)
  - Repositioning should be undertaken to reduce the duration & magnitude of pressure over vulnerable areas
  - Consider right surface with right frequency[1]
  - Cushioning devices to maintain alignment /30° side-lying & prevent pressure on bony prominences
    - Between pillows and wedges, the wedge system was more effective in reducing pressure in the sacral area (healthy subjects)[2]
  - Assess whether actual offloading has occurred
  - Use lifting device or other aids to reposition & make it easy to achieve the turn

1. McNichol L, et al. J Wound Ostomy Continence Nurse, 2015;42(1):19-37.
2. Bush T, et al. WOCN, 2015;42(4):338-345
3. Reger SI et al, OWM, 2007;53(10):50-58, www.ihi.org
4. National Pressure injury Advisory Panel, European Pressure injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure injurys :clinical practice guideline. Emily Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

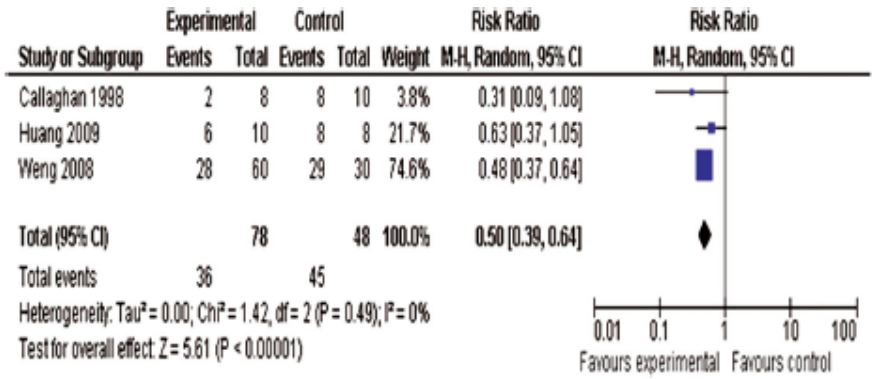
EBP Recommendations to Reduce Shear & Friction

- Loose covers & increased immersion in the support medium increase contact area
- Prophylactic dressings: emerging science
- Use lifting/transfer devices & other aids to reduce shear & friction.
  - Mechanical lifts
  - Transfer sheets
  - 2-4 person lifts
  - Turn & assist features on beds
- Do not leave moving and handling equip underneath the patient, unless it is specifically designed for this purpose

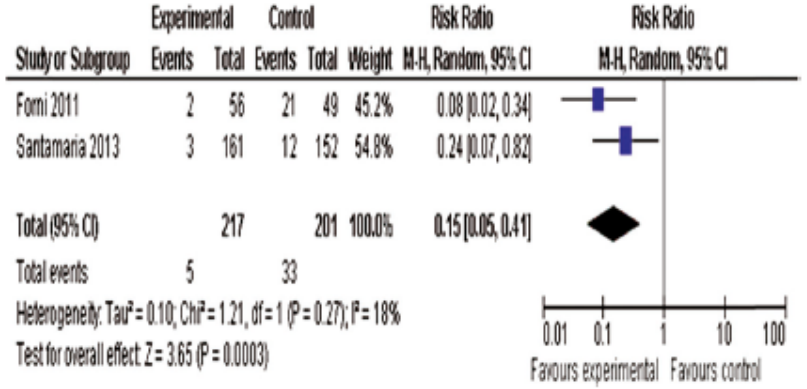
National Pressure injury Advisory Panel, European Pressure injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure injurys :clinical practice guideline. Emily Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

Systematic Review: Use of Prophylactic Dressing in Pressure Injury Prevention

- 21 studies met the criteria for review
- 2 RCTs, 9 had a comparator arm, 5 cohort studies, 1 within-subject design where prophylactic dressings were applied to one trochanter with the other trochanter dressing free



Evaluated nasal bridge device injury prevention



Evaluated sacral pressure injury prevention

Clark M, Black J, et al. Int Wound J 2014; 11:460–471

EBP Recommendations to Reduce Shear & Friction

- Loose covers & increased immersion in the support medium increase contact area
- Prophylactic dressings: emerging science
- Use lifting/transfer devices & other aids to reduce shear & friction.
  - Mechanical lifts
  - Transfer sheets
  - 2-4 person lifts
  - Turn & assist features on beds
- Do not leave moving and handling equip underneath the patient, unless it is specifically designed for this purpose

National Pressure injury Advisory Panel, European Pressure injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention & treatment of pressure injurys :clinical practice guideline. Emily Haesler (Ed) Cambridge Media: Osborne Park: Western Austrlia;2014

Human Factor Engineering & Ergonomics

- Human Factors
  - The application of scientific knowledge about human strengths and limitations to the design of systems in the work environment to ensure safe and satisfying performance.
- Ergonomics
  - The science of fitting workplace conditions and job demands to the capabilities of the working population. A good fit between employee capabilities, workplace conditions, and job demands helps ensure high productivity, avoid illness and injury, and increase satisfaction in the workforce.

Translates to higher quality patient care and fewer adverse events for workers and patients.

The Tale of Ceiling Lifts

- Mechanical lifts are often not used to the extent that was intended, reportedly due to poor access, lack of space for use or storage, inadequate staffing, or increased time required for use of the lift compared to manual methods.[1,2]
- Studies have shown that ceiling lifts may not be suitable for all patient handling tasks.[3,4]
- Implementing a ceiling lift program significantly reduced (58% reduction, p= 0.011) the rate of musculoskeletal injuries (MSI) to nurses and care aides caused by lifting and transferring.
- Study showed that ceiling lifts did not positively impact rates of MSI caused by repositioning patients in bed.[3]

1. Daynard et al., 2001
2. Evanoff et al., 2003; Garg et al., 1991a, b.
3. Ronald et al., 2002
4. Villeneuve, 1998

Achieving the Use of the Evidence for Pressure Injury Reduction

- Resource & System
  - Breathable glide sheet/stays
  - Foam wedges
  - Microclimate control
  - Reduce layers of linen
  - Wick away moisture body pad
  - Protects the caregiver

Vollman KM. Intensive Care Nurse.2013;29(5):250-5

Comparative Study of Two Methods of Turning & Positioning

- Non-randomized comparison design
- 59 neuro/trauma ICU mechanically ventilated patients
- Compared SOC: pillows/draw sheet vs turn and position system (breathable glide sheet/foam wedges/wick away pad)
- Measured PU incidence, turning effectiveness & nursing resources

	SOC	PPS	*P*
Mean time on product (range), d	7 (1-29)	7 (1-45)	1.00
Mean age (SD) (range), y	57.72 (18.45) (18-89)	57.73 (17.67) (23-92)	1.00
Gender			
Female	14	10	.43
Male	16	19	
Braden Scale score	12.77	13.23	.46
Mobility	0-1	0-1	1.00
BMI	29.62	30.97	.65

Powers J, J Wound Ostomy Continence Nur, 2016;43(1):46-50

Comparative Study of Two Methods of Turning & Positioning

- Results:
  - Nurse satisfaction 87% versus 34%
  - 30° turn achieved versus -15.4 in SOC/7.12 degree difference at 1hr (p<.0001)

	SOC	PPS	P
PU development	6	1[a]	.04
# of times patients pulled up in bed	3.28	2.58	.03
# of staff required to turn patient	1.97	1.35	<.0001

1[a] PU development with 24hrs of admission

Powers J, J Wound Ostomy Continence Nur, 2016;43(1):46-50

PU = Pressure Ulcer
PI = Pressure Injury

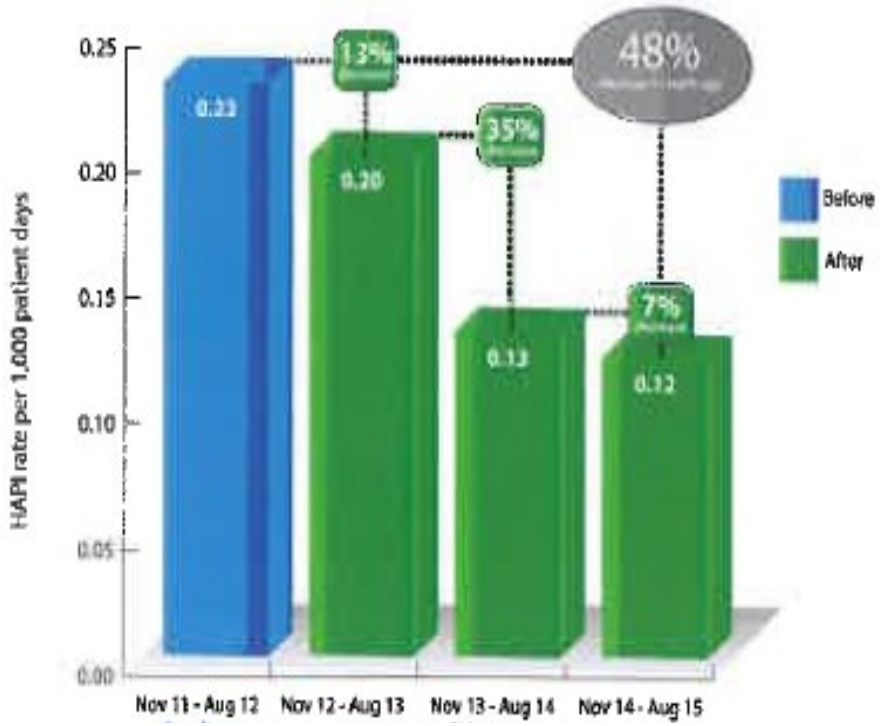
Impact of a Turn & Position Device on PI & Staff Time

- Prospective, QI study (1 SICU & 1 MICU)
- 2 phases
  - SOC: pillows, underpads, standard low airloss bed, and additional staff if required
  - Interventional: turn and position system, a large wicking pad (part of the product)
  - Inclusion criteria: newly admitted, non-ambulatory, required 2 or more to assist with turning/ repositioning
  - Turning procedures were timed/admitting till ICU discharge
- Results
  - No difference in sociodemographic and clinical data between the groups
  - Phase 1: 14 patients (28%) Stage II sacral PI
  - Phase 2: zero sacral PI ($p<.0001$)
  - Timing:
    - Phase 1: 16.34 mins (range 4-60min) SD= 10.08
    - Phase 2: 3.58 mins (range 1.12-8.48) SD = 2.31 ($p=0.0006$)

Hall KD, et al. Ostomy Wound Management, Nov 2016:40-44

Reducing HAPI & Patient Handling Injuries

- Compared pre-implementation turning practice: pillows/draw sheet vs turn and position system (breathable glide sheet/foam wedges/wick away pad)
- Baseline: November 2011-August 2012
- Implementation period: November 2012 to August 2015
- 3,660 patients
- Compared HAPI rates, patient handling injuries, and cost

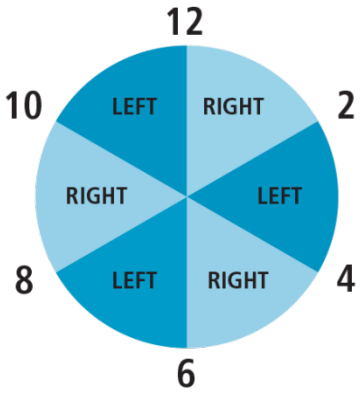


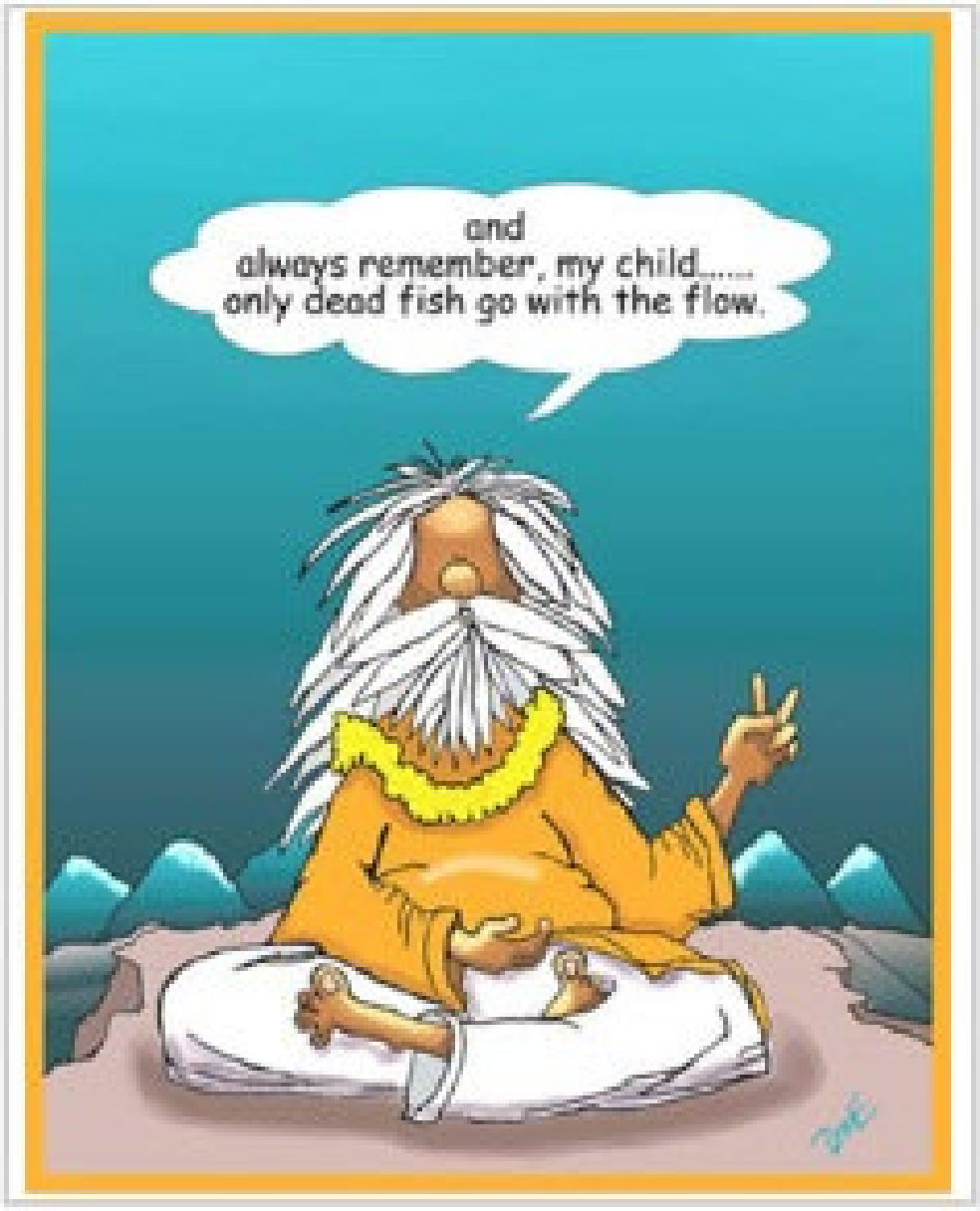
Patient Handling Injury and Costs	January 2012 to October 2012 (Before)	November 2012 to August 2013 (After)	November 2013 to August 2014 (After)	November 2014 to August 2015 (After)
Injuries/Cost	19/$427,500	8/$180,000	2/$45,000	5*/$112,500

74% reduction

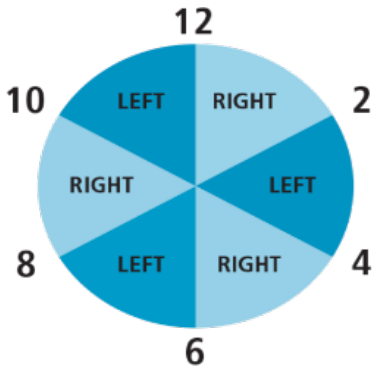
Way H, Am JSPHM, 2016;6(4):160-165

In-Bed Technology

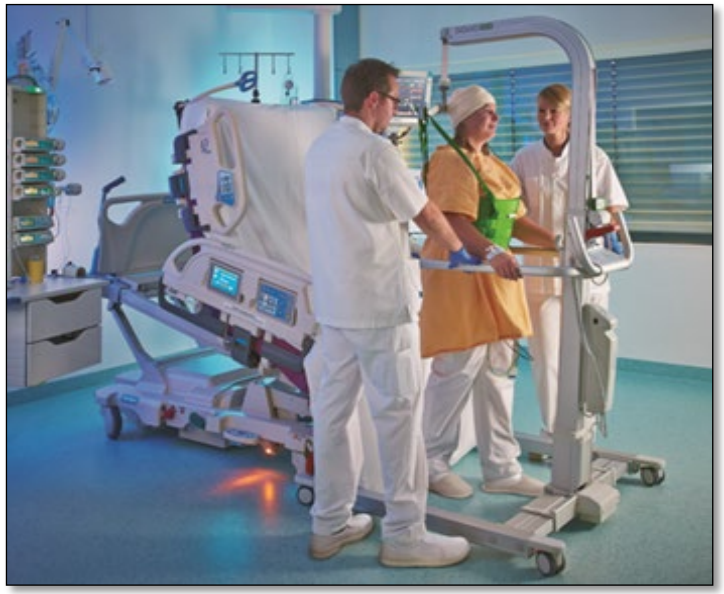



and
always remember, my child.....
only dead fish go with the flow.

Transition: In-Bed to Out-of-Bed & Back



Out-of-Bed Technology

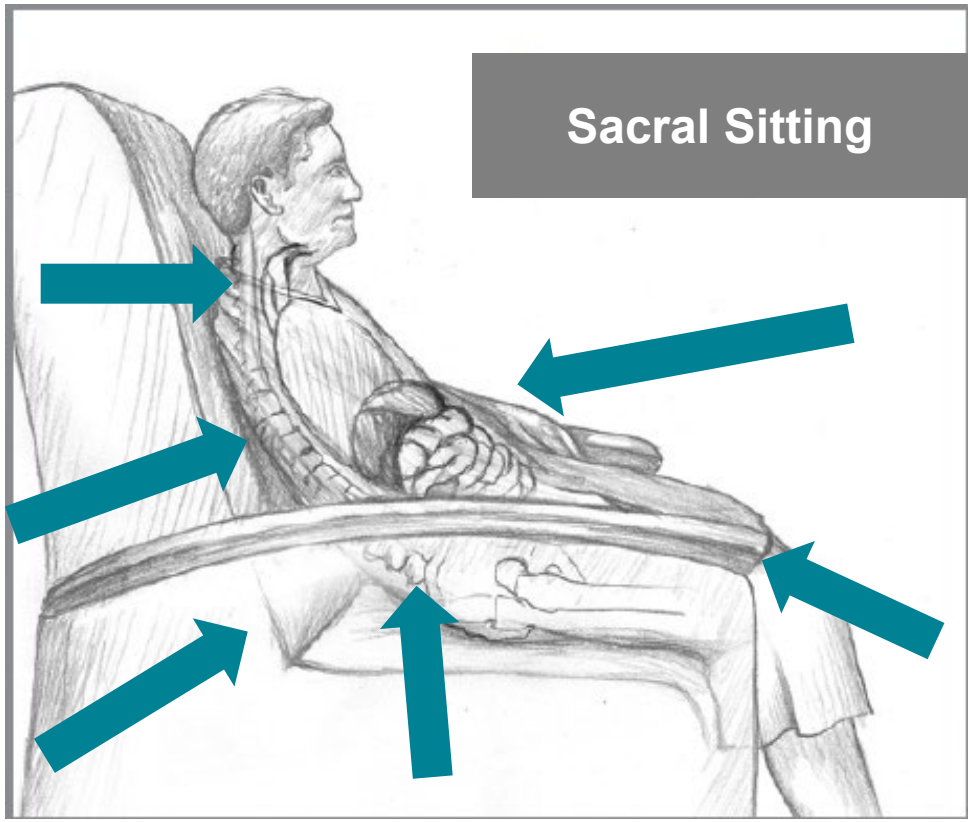


Current seating positioning challenges

Airway & epiglottis compressed

Body alignment

Shear/Friction



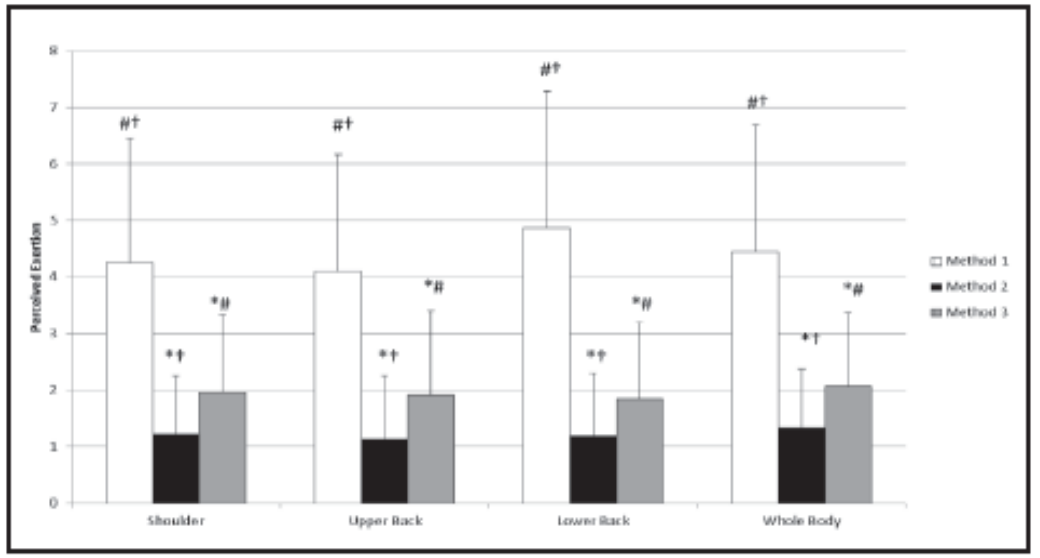
Frequent repositioning & potential caregiver injury

Potential risk of sliding from chair

Sacral pressure

Repositioning patients in chairs:
an improved method (SPS)

- Study the exertion required for 3 methods of repositioning patients in chairs
- 31 caregiver volunteers
- Each one trial of all 3 reposition methods
- Reported perceived exertion using the Borg tool, a validated scale



Method 1: 2 caregivers using old method of repositioning
246% greater exertion than SPS
Method 2: 2 caregivers with SPS
Method 3: 1 caregiver with SPS
52% greater exertion than method 2

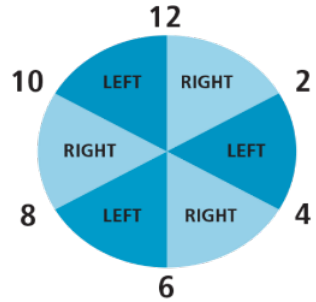
Fragala G, et al. Workplace Health & Safety;61:141-144

Ambulation Assist Devices

"Even if you are on the right track, you will get run over if you just sit there."

Will Rogers

Progressive Mobility + Caregiver Safety + Skin Safety

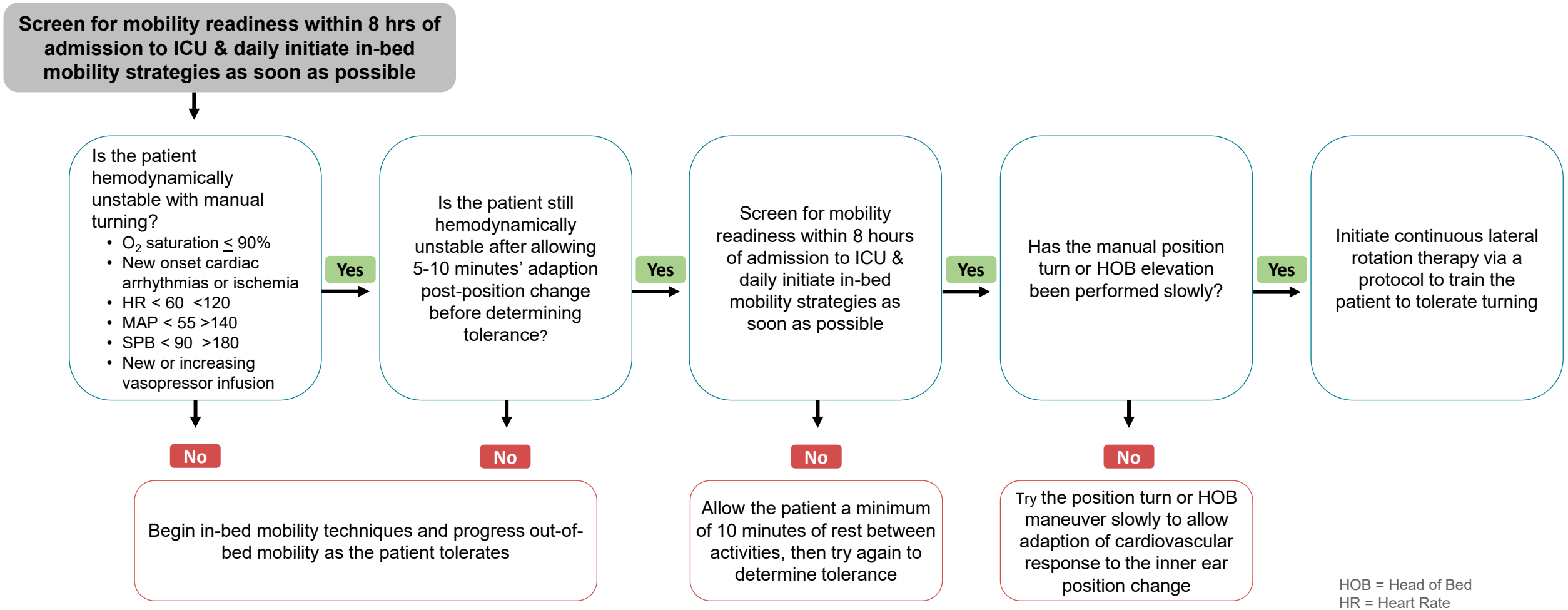


Challenges to Mobilizing Patients

- Potentially Modifiable Barriers
  - Patient – related barriers (50%)
    - Hemodynamic instability, ICU devices, physical & neuropsych
  - Structural (18%)
    - Human or technological Resources
  - ICU culture (18%)
    - Knowledge/ Priority/ Habits
  - Process related (14%)
    - Service delivery/ lack of coordination
    - Clinician function

Dubb R, et al, Annual ATS, 2016 in press

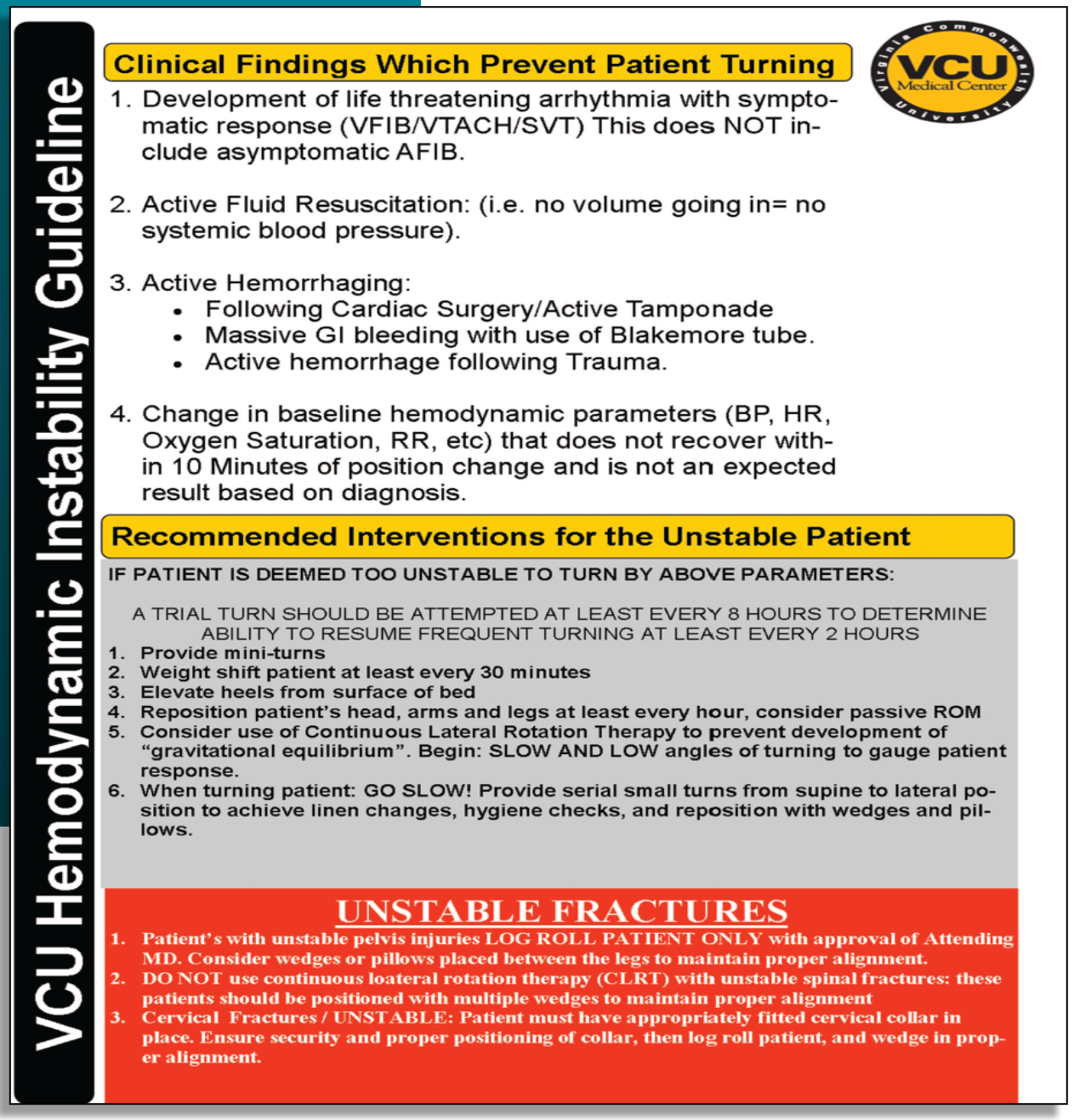
Decision-Making Tree for Patients Who Are Hemodynamically Unstable With Movement[1,2]



1. Vollman KM. Crit Care Nurse. 2012;32:70-75.
2. Vollman KM. Crit Care Nurs Q. 2013;36:17-27.

HOB = Head of Bed
HR = Heart Rate
MAP = Mean Arterial Pressure
SPB = Systolic Blood Pressure

Example Guideline



VCU Hemodynamic Instability Guideline

Clinical Findings Which Prevent Patient Turning

1. Development of life threatening arrhythmia with symptomatic response (VFIB/VTACH/SVT) This does NOT include asymptomatic AFIB.

2. Active Fluid Resuscitation: (i.e. no volume going in= no systemic blood pressure).

3. Active Hemorrhaging:
   - Following Cardiac Surgery/Active Tamponade
   - Massive GI bleeding with use of Blakemore tube.
   - Active hemorrhage following Trauma.

4. Change in baseline hemodynamic parameters (BP, HR, Oxygen Saturation, RR, etc) that does not recover within 10 Minutes of position change and is not an expected result based on diagnosis.

Recommended Interventions for the Unstable Patient

IF PATIENT IS DEEMED TOO UNSTABLE TO TURN BY ABOVE PARAMETERS:

A TRIAL TURN SHOULD BE ATTEMPTED AT LEAST EVERY 8 HOURS TO DETERMINE ABILITY TO RESUME FREQUENT TURNING AT LEAST EVERY 2 HOURS

1. Provide mini-turns
2. Weight shift patient at least every 30 minutes
3. Elevate heels from surface of bed
4. Reposition patient's head, arms and legs at least every hour, consider passive ROM
5. Consider use of Continuous Lateral Rotation Therapy to prevent development of "gravitational equilibrium". Begin: SLOW AND LOW angles of turning to gauge patient response.
6. When turning patient: GO SLOW! Provide serial small turns from supine to lateral position to achieve linen changes, hygiene checks, and reposition with wedges and pillows.

UNSTABLE FRACTURES

1. Patient's with unstable pelvis injuries LOG ROLL PATIENT ONLY with approval of Attending MD. Consider wedges or pillows placed between the legs to maintain proper alignment.
2. DO NOT use continuous loateral rotation therapy (CLRT) with unstable spinal fractures: these patients should be positioned with multiple wedges to maintain proper alignment
3. Cervical Fractures / UNSTABLE: Patient must have appropriately fitted cervical collar in place. Ensure security and proper positioning of collar, then log roll patient, and wedge in proper alignment.

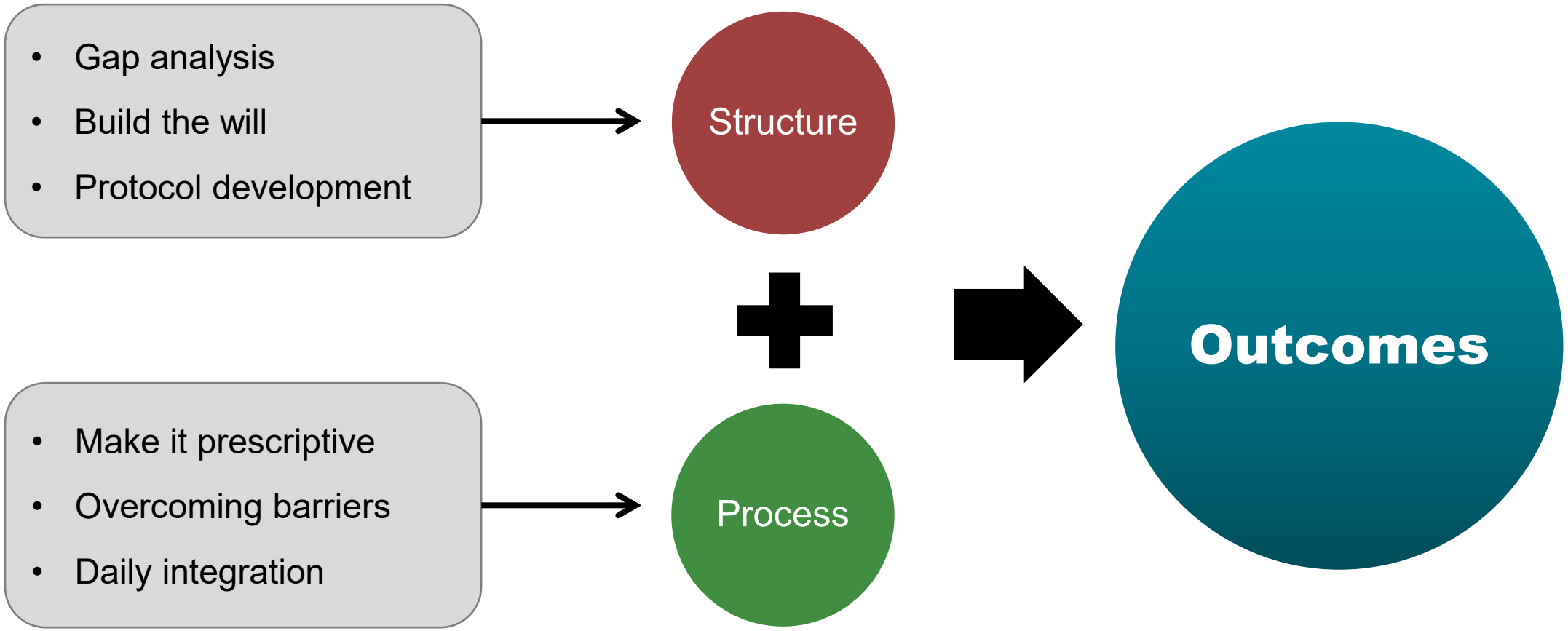
Brindle TC, et al. WOCN, 2013;40(3):254-267

"Even if you are on the right track, you will get run over if you just sit there."

Will Rogers

How do we make it happen?

Driving Change



The Goal:
Patient and Caregiver Safety

- ↓ Repetitive motion injury
- ↓ Musculoskeletal injury
- ↓ Days away from work
- ↓ Staffing challenges
- ↓ Loss of experienced staff
- Nursing shortage

- ↓ Skin injury
- ↓ Costs
- ↓ Pain and suffering
- ↓ Hospital LOS
- ↓ ICU LOS

- ↓ Hospital LOS
- ↓ ICU LOS
- ↓ Skin injury
- ↓ CAUTI
- ↓ Delirium
- ↓ Time on the vent

- ↓ Falls
- ↓ Falls with injury
- ↓ Hospital LOS

Black J, et al. Crit Care Nurs Q. 2018;41(3):226-239.

Contact Information

- kvollman@comcast.net
- www.Vollman.com

How to earn your CE

1. Type focusrn.stryker.com into your internet browser.
2. Click new user – self register in the login area to create a profile and register.
3. Check your email the week following your event, with instructions to login.
4. On your next visit to the website, you'll see an area prompting you to complete your evaluation. This will allow you to access your downloadable certificate of completion.

focusrn.stryker.com

FocusRN®
clinical education program

Questions?

Thank you!