Opportunities & Challenges in Rehabilitation for Older Adults in the Hospital Setting

Dr Tham Shuen-Loong
Consultant, Rehabilitation Medicine
Tan Tock Seng Hospital

Opportunities & Challenges in Rehab for Older Hospitalized Adults

Two-thirds of previously home-living elderly patients deteriorate in their functional levels between hospital admission and discharge.

Lamont CT, Sampson S, Matthias R, Kane R. The outcome of hospitalization for acute illness in the elderly. J Am Geriatr Soc 1983; 31:282-288.

McVey L, Becky PM, Saltz CC et al. Effects of a geriatric consult team on functional functional status in elderly hospitalized patients. Ann Int Med 1989; 110:78-84.

Significant functional loss is observed in one third of elderly hospitalized patients.

Patients with frailty or multimorbidity have a higher risk for hospitalization and adverse outcome, such as hospitalization-associated disability and the inability to live independently

Covinsky KE, Pierluissi E, Johnston CB. Hospitalization-associated disability: ”She was probably able to ambulate, but I’m not sure. “ JAMA. 2011; 306(16): 1782-1793.

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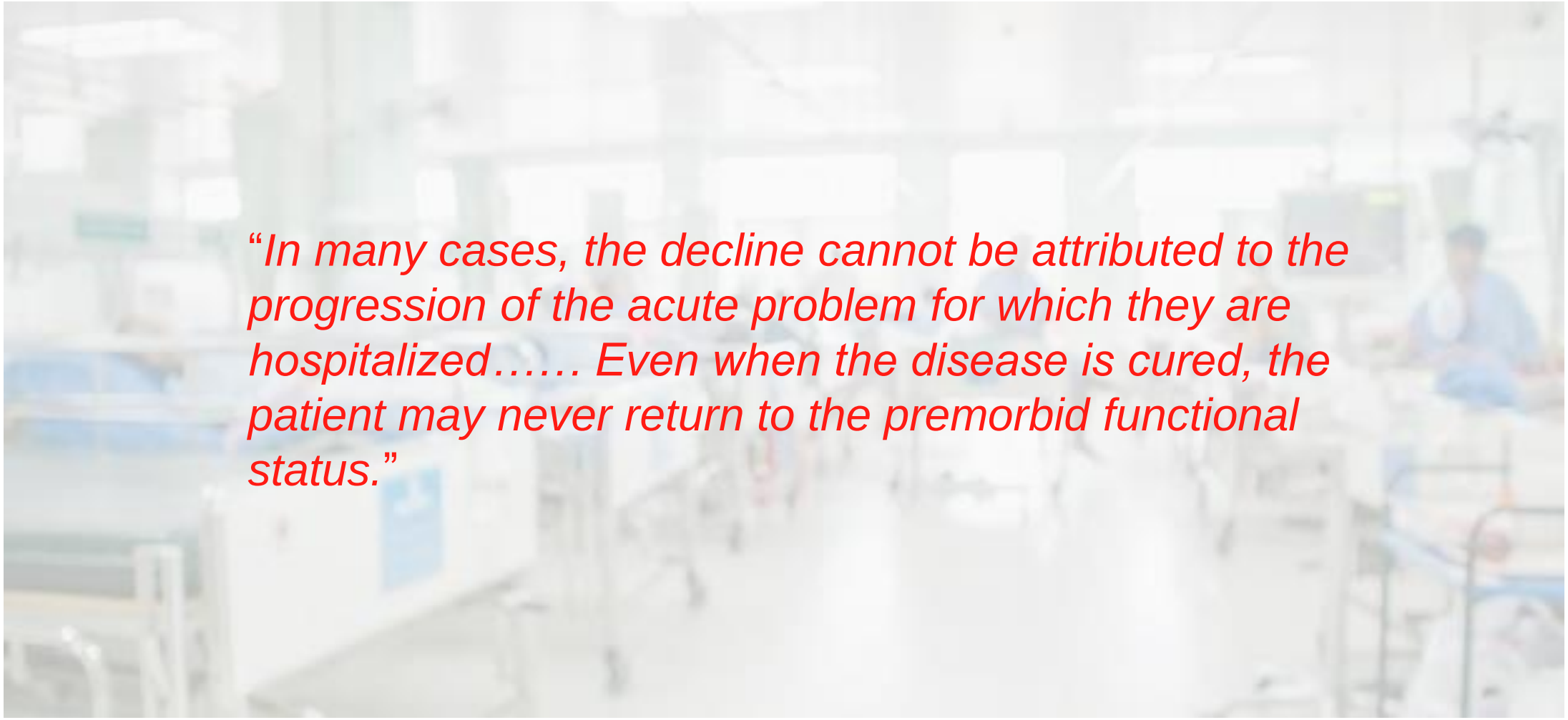
"The hospital environment has traditionally focused on medically managing illness states ….. The environment is designed for the rapid and effective delivery of care – not for enhancing patient function[1]"

[1]Kleinpell RM et al. Reducing functional decline in hospitalized elderly. In: Huges RG, editor. *Patient safety and quality: an evidence-based handbook for nurses. Agency for Healthcare research and Quality (US);* 2008 Apr; Chapter 11.



Creditor MC. Hazards of hospitalization of the elderly. Ann Int Med 1993; 3: 219-223

Challenges

1. Defining the Problem
2. Assessment
3. Interventions

Challenge 1: Defining the problem

(a) **Lack of agreed / standard definitions**

- Even though the construct of HAD is well described in literature, this term is not recognized by the ICD[1]
- Terminology is not standardized[2]: Different terminology found in literature eg. medical deconditioning, hospital-associated deconditioning (HAD), hospital acquired deconditioning, post hospital syndrome
- Impact on ability to request for funding for treatment programs and conduct of research to assess the effectiveness of such programs[1].

1. Timmer AJ, Unsworth CA, Taylor NF. Rehabilitation interventions with deconditioned older adults following an acute hospital admission: a systematic review. Clin Rehabil. 2014 Nov;28(11):1078-86.
2. Gordon S, Grimmer KA, Barras S. Assessment for incipient hospital-acquired deconditioning in acute hospital setting: A systemic literature review. *J Rehabil Med* 2019; 51: 397-404

Challenge 1: Defining the problem

(b) Lack of agreement on the elements[1]

- Most authors describe a decline in physical function and ability (eg. Ambulation, self-care tasks)
- Some included other systemic dysfunctions eg. Continence, cognition

1. Gordon S, Grimmer KA, Barras S. Assessment for incipient hospital-acquired deconditioning in acute hospital setting: A systemic literature review. *J Rehabil Med* 2019; 51: 397-404
2. Krumholz HM. Post-Hospital Syndrome – A condition of generalized risk. *NEJM*. 2013 Jan 10; 368(2): 100-102

Hazards of Hospitalization

1. Decline in muscle strength
2. Decline in aerobic capacity
3. Vasomotor instability
4. Reduced bone density
5. Reduced pulmonary ventilation
6. Altered sensory “continence” - confusion
7. Reduced appetite and thirst
8. Urinary incontinence

Creditor MC. Hazards of hospitalization of the elderly. Ann Int Med 1993; 3: 219-223

Hospital Acquired Deconditioning vs Frailty

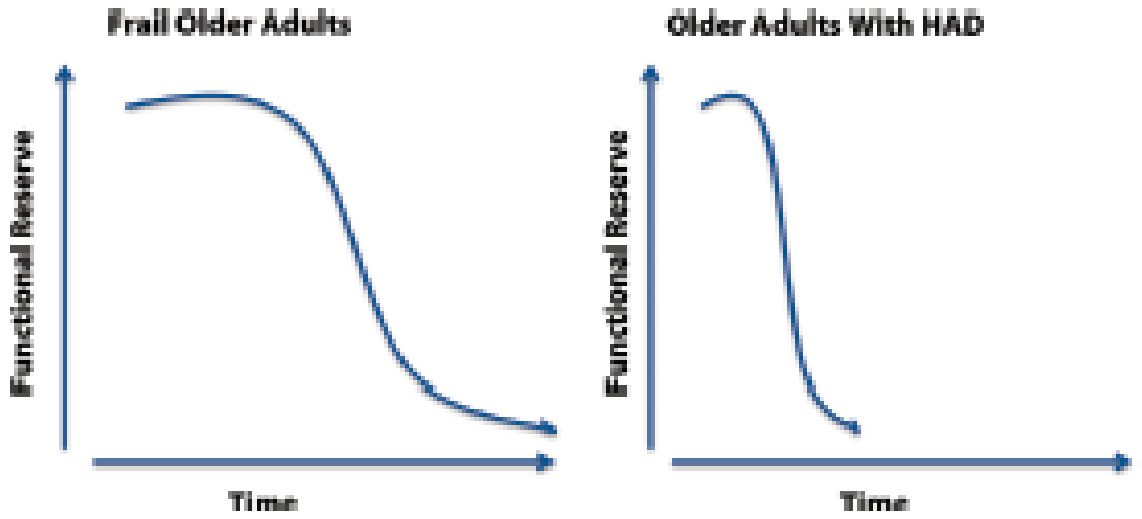
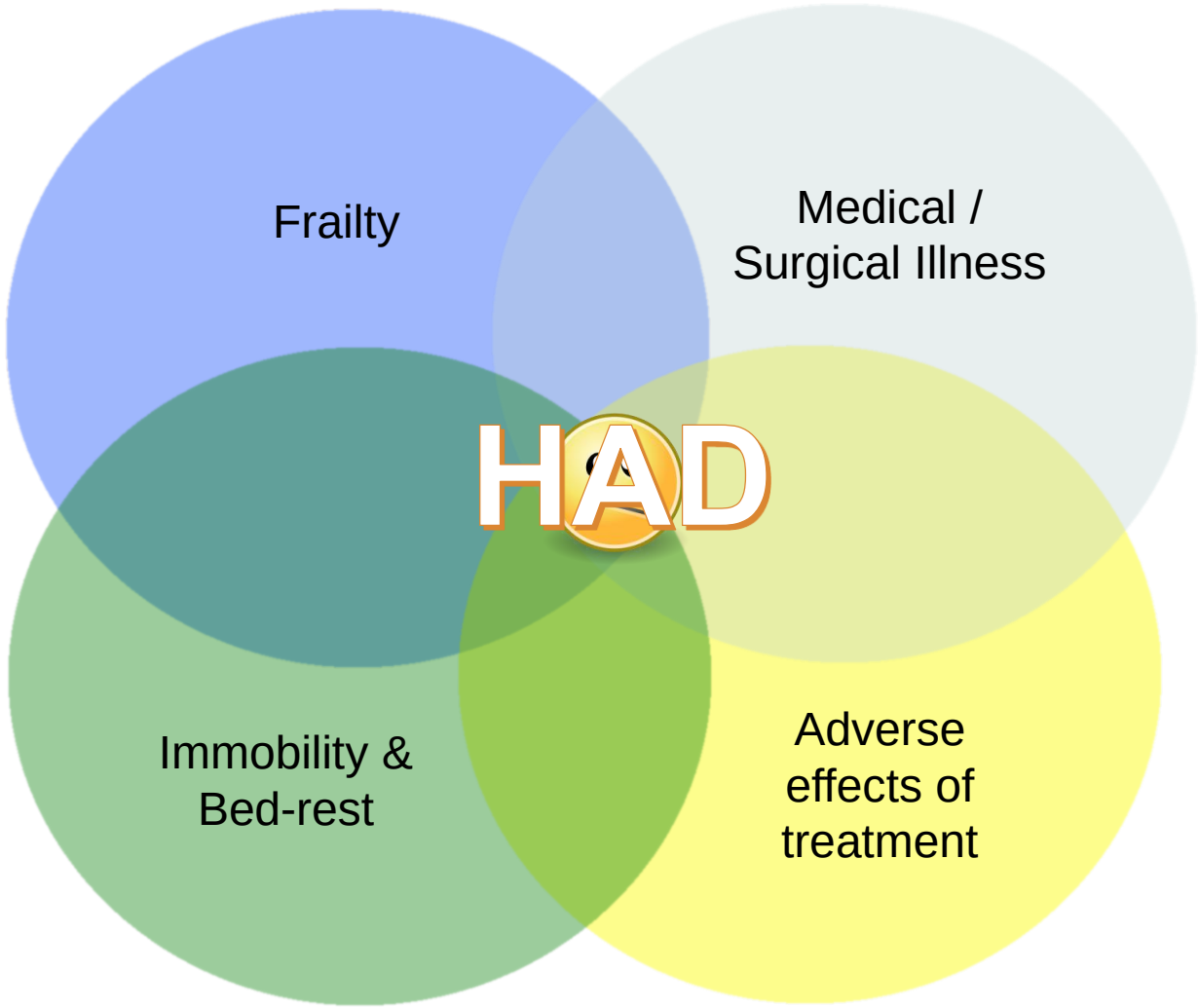


Figure 1.
Differing trajectories leading to a loss of functional reserve in older adults. HAD=hospital-associated deconditioning.

Falvey JR, Mangione KK, Stevens-Lapsley JE. Rethinking hospital-associated deconditioning: proposed paradigm shift. *Phys Ther* 2015; 95: 1307-1315



Interaction between factors in HAD & Frailty

- Kortebein P. Rehabilitation for hospital-associated deconditioning. Am J Phys Med Rehabil 2009; 88:66-77
- Hoenig HM, Rubenstein LZ. Hospital-associated deconditioning and dysfunction. J Am Geriatr Soc. 1991 Feb;39(2):220-2.

Older adults with frailty experience an accelerated loss of function during hospitalization compared with older adults without frailty…….

Lafont C, Gerard S, Voisin T, et al. Reducing “iatrogenic disability” in the hospitalized frail elderly. *J Nutr Health Aging* 2011; 15: 645-660.

……. And they have higher rates of institutionalization…..

Robinson TN, Wallace JI, Wu DS, et al. Accumulated frailty characteristics predict postoperative discharge institutionalization in the geriatric patient. J Am Coll Surg. 2011; 213:37-42; discussion 42-34.

……. and mortality after hospitalization.

Lahousse L, Maes B, Ziere G, et al. Adverse outcomes of frailty in the elderly: the Rotterdam Study, Eur J Epidemiol. 2014; 29: 419-427

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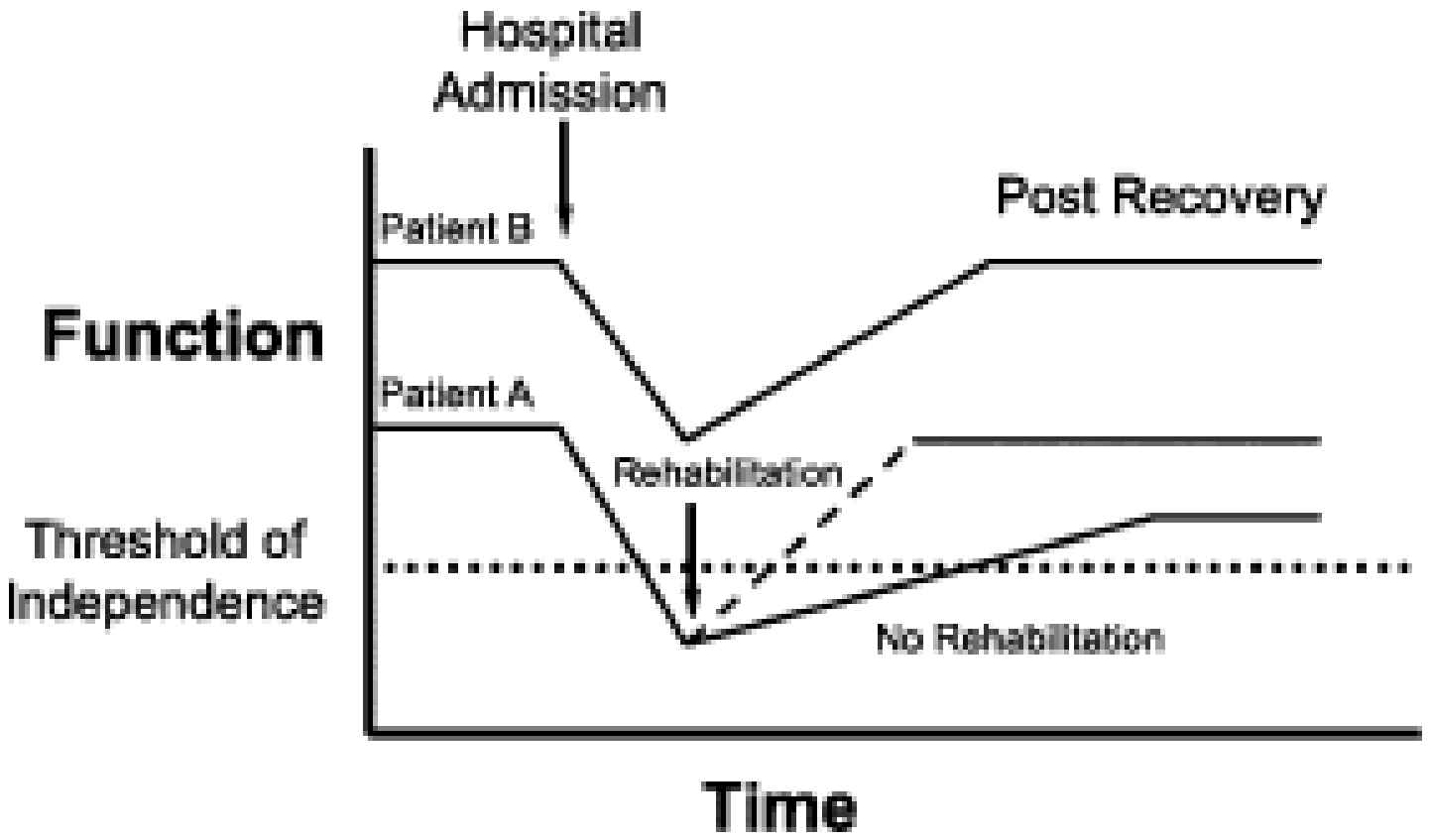

Functional decline during hospitalization.

Kortebein P. Rehabilitation for hospital-associated deconditioning. Am J Phys Med Rehabil 2009; 88:66-77

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Table 1. Interaction of Aging and Hospitalization

Changes with Usual Aging	Contribution of Hospitalization	Potential Primary Effects	Potential Secondary Consequences
Reduced muscle strength and aerobic capacity	Immobilization, high bed and rails	Deconditioning, fall	Dependency
Vasomotor instability	Reduced plasma volume	Syncope, dizziness	Fall, fracture
Baroreceptor insensitivity and reduced total body water	Inaccessibility of fluids		
Reduced bone density	Accelerated bone loss	Increased fracture risk	Fracture
Reduced ventilation	Increased closing volume	Reduced Po_2	Syncope, delirium
Reduced sensory continence	Isolation, lost glasses, lost hearing aid, sensory deprivation	Delirium	False labeling, physical restraint, chemical restraint
Altered thirst, taste, smell, and dentition	Barriers, "tethers," therapeutic diets	Dehydration, malnutrition	Reduced plasma volume, tube feeding
Fragile skin	Immobilization, shearing forces	Pressure sore	Infection
Tendency to urinary incontinence	Barriers, "tethers"	Functional incontinence	Catheter, family rejection

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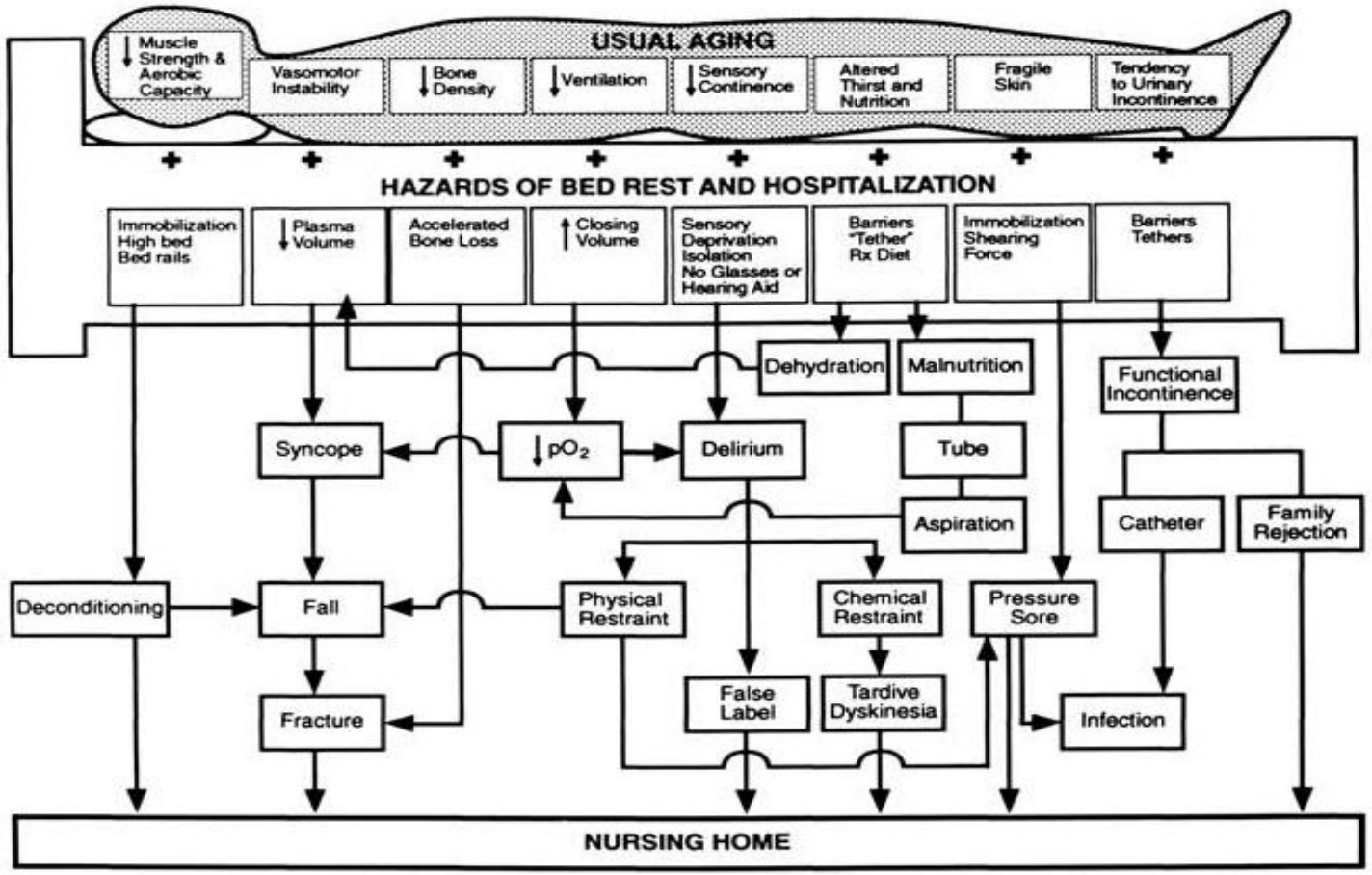

Figure 1. The cascade to dependency.

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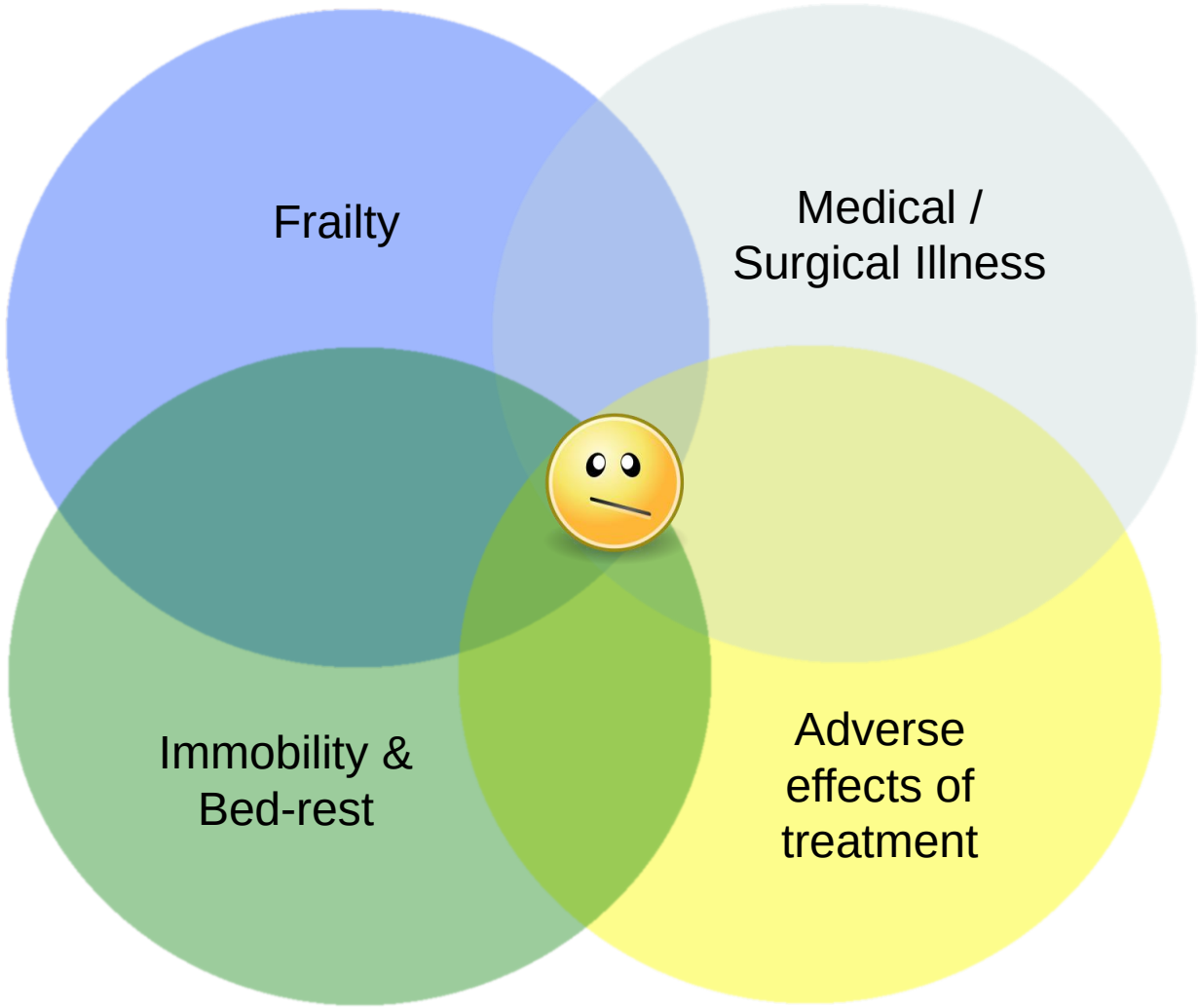

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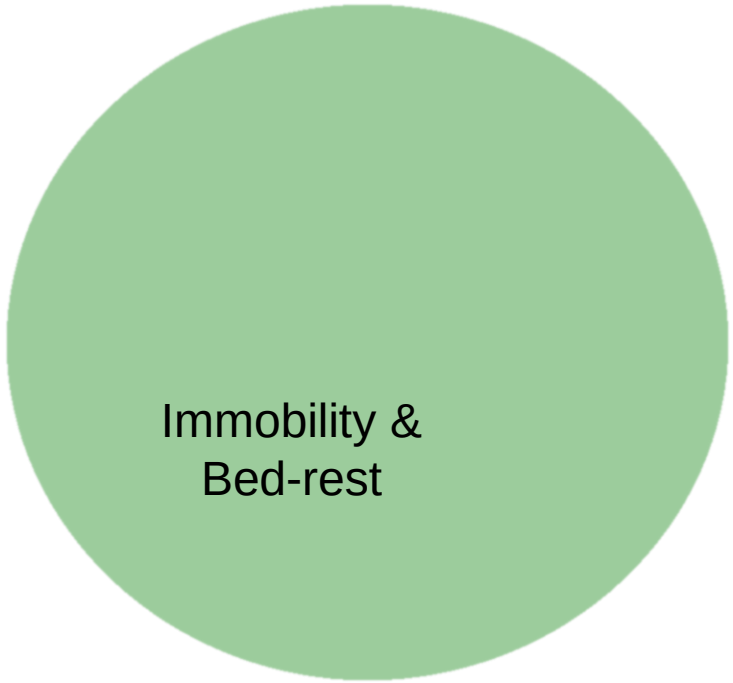

Physical Therapy

Challenge 2: Assessment

- Purpose of assessment: to detect incipient HAD and to track progress/effects of intervention(s)
- Current state-of-affairs: Assessments are -
    1. Inconsistently conducted by different healthcare professionals
    2. A variety of assessment instruments are used
    3. Assessed over differing time periods
    4. Assessment findings are variably recorded and shared (if at all)
    5. No comprehensive agreed assessment for HAD

=> Constraints proactivity in preventing HAD

Gordon S, Grimmer KA, Barras S. Assessment for incipient hospital-acquired deconditioning in acute hospital setting: A systemic literature review. *J Rehabil Med* 2019; 51: 397-404

Table II. Relevant hospital-acquired deconditioning (HAD) assessment items, and the body systems they address, from included instruments

	TUG	PPT	NSIC	SPPB	MNA	DEMMI	AM-PAC "6 clicks"	Totals
Measurement period	P-i-T	P-i-T	Recent	P-i-T	P-i-T	P-i-T	P-i-T	
Muscle strength	✓	✓		✓		✓	✓	5
Aerobic capacity/fitness/respiratory function	✓			✓		✓	✓	4
Vasomotor stability/balance	✓	✓		✓		✓		4
Anthropometrics					✓			1
Skin integrity				✓				1
Mobility	✓	✓		✓	✓		✓	4
Activities of daily activities		✓	✓		✓ (implied)		✓	4
Walking distance	✓	✓		✓	✓ (implied)			4
Gait speed	✓	✓		✓				3
Appetite			✓		✓			
Incontinence								0
Total	6	6	2	7	5	3	4	

TUG: Timed Up and Go Test (25); PPT: Physical Performance Test (26); NSIC: Nutrition Screening Initiative Checklist (28); SPPB: Short Physical Performance Battery (29); MNA: Mini Nutritional Assessment (30); DEMMI: de Morton Mobility Index (31); AM-PAC 6 Clicks: Activity Measure for Post-Acute Care (AM-PAC "6 Clicks") (32).

Gordon S, Grimmer KA, Barras S. Assessment for incipient hospital-acquired deconditioning in acute hospital setting: A systemic literature review. *J Rehabil Med* 2019; 51: 397-404

Challenge 3: Interventions

- No adequate rehabilitation protocols available for HAD
- No RCT of good quality examining the effectiveness of specific reconditioning interventions[1]

1. Timmer AJ, Unsworth CA, Taylor NF. Rehabilitation interventions with deconditioned older adults following an acute hospital admission: a systematic review. *Clin Rehabil*. 2014;28(11):1078-1086.

Challenge 3: Interventions

Traditionally held belief that General Conditioning Activities (GCAs) are better for older adults as they are ”safer”[1]

- Need to increase emphasis on higher intensity resistance training[2, 3] and de-emphasizing GCAs
- Resistance training should form the basis for therapeutic interventions, but elements such as aerobic training can form part of the the multicomponent rehabilitation program.

1. Falvey JR, Mangione KK, Stevens-Lapsley JE. Rethinking hospital associated deconditioning: proposed paradigm shift, Phys Ther 2015; 95:1307-1315
2. American College of Sports Medicine. ACSM’s Guidelines for Exercise Testing and Prescription. 9th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2013.
3. Walston J, Hadley EC, Ferrucci L, et al. Research agenda for frailty in older adults: toward a better understanding of physiology and etiology: summary from the American Geriatrics Society/National Institute on Aging Research Conference on Frailty in Older Adults. J Am Geriatr Soc. 2006; 54:991–1001.

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Current Rehabilitation Hierarchy for Older Adults With HAD

Updated Rehabilitation Hierarchy for Older Adults With HAD

Challenge 3: Interventions

Dosage

- ? Timing of rehabilitative intervention: inpatient[2] vs outpatient[3]
- ? Frequency
- ? Duration of rehabilitation intervention

1. Falvey JR, Mangione KK, Stevens-Lapsley JE. Rethinking hospital associated deconditioning: proposed paradigm shift, Phys Ther 2015; 95:1307-1315
2. Brown CJ, Peel C, Bamman MM and Allman RM. Exercise program implementation proves not feasible during acute care hospitalization. J Rehabil Res Dev 2006; 43: 939–946.

Opportunities

1. Early Rehabilitation
2. Multidisciplinary team members are geographically co-located
3. Transdisciplinary Care

Opportunity 1: Early Rehabilitation

- Provision of early rehabilitation interventions whilst patients undergoing concurrent medical treatment appears to have some functional benefit and attenuates HAD[1, 2]
- Need for synchronous vital signs monitoring
- Physical therapy with medical guidance

1. Suriyaarachchi P, Chu L, Bishop A, Thew T, Matthews K, Cowan R, Gunawardene P, Duque G. Evaluating Effectiveness of an Acute Rehabilitation Program in Hospital-Associated Deconditioning. J Geriatr Phys Ther. 2020 Oct/Dec;43(4):172-178
2. Hartley PJ, Keevil VL, Alushi L, et al. Earlier physical therapy input is associated with a reduced length of hospital stay and reduced care needs on discharge in frail older inpatients: an observational study. *J Geriatr Phys Ther*. 2019;42(2):E7-E14.

Opportunity 2: Under One Roof

- Multidisciplinary team[1] is needed to address a multifaceted entity such as HAD
- Other than PT who can provide for physical therapy: eg.
  - OT: Functional Tasks
  - Dietician/Nutritionist: Optimizing intake and nutrition
  - Psychologist: Mood and Cognitive support
  - MSW: Psychosocial support; Discharge planning

1. Suriyaarachchi P, Chu L, Bishop A, Thew T, Matthews K, Cowan R, Gunawardene P, Duque G. Evaluating Effectiveness of an Acute Rehabilitation Program in Hospital-Associated Deconditioning. J Geriatr Phys Ther. 2020 Oct/Dec;43(4):172-178

Opportunity 3: Transdisciplinarity

- Rehabilitation units typically provide 15 hours of therapy a week ie. PT 1 hour, OT 1 hour, Others (eg. ST, Psychologist, Dietician) 1 hour per week; 5 days a week
- Acute units typically provides provides less formal therapy time
- Transdisciplinary care increases the frequency of physical therapy throughout the week

1. Suriyaarachchi P, Chu L, Bishop A, Thew T, Matthews K, Cowan R, Gunawardene P, Duque G. Evaluating Effectiveness of an Acute Rehabilitation Program in Hospital-Associated Deconditioning. J Geriatr Phys Ther. 2020 Oct/Dec;43(4):172-178

Summary

Challenges	Opportunities
• Lack of a standard definition of Hospital Acquired Deconditioning (inconsistencies in nomenclature)	• Multidisciplinary team members are geographically co-located
• Complex interactions between elements contributing to Hospital Acquired Deconditioning	• Trans-disciplinary care
• Difficulty in coming up with a standard assessment of HAD	• Early Rehab - Opportunity to intervene before HAD sets in
• Lack of standardized treatment strategies	

Thank You