

Getting Fit for Transplant

Thuy Koll, MD
Assistant Professor
Division of Geriatrics
Department of Internal Medicine

UNMCSM

BREAKTHROUGHS FOR LIFE.[®]



UNIVERSITY OF
Nebraska
Medical Center

No Disclosures.



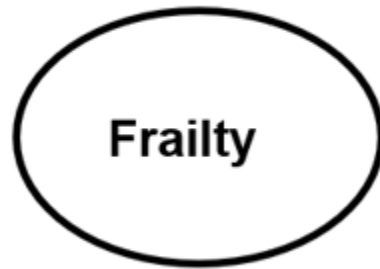
Objectives

- **Describe frailty in transplant**
- **Discuss the role of physical activity for older transplant patients**
- **Share our experiences at UNMC**



Aging Continuum

**Normal
Performance**



**Functional
Decline**

Disability



The clinical syndrome (Fried et al. 2001)

- Unintentional weight loss
- Low physical activity
- Weakness
- Slow gait
- Self-reported exhaustion



Clinical Consequences (Fried et al. 2001)

- Falls
- Worsening mobility
- Hospitalizations
- Delirium
- Loss of independence
- Death



Hematologic
Malignancy

Chemotherapy

HCT Experience
Hospitalization
Immobility
Delirium
Immunosuppression
Supportive care meds
(anticholinergic properties)

Treatment-related sequelae
Nausea
Vomiting
Mucositis
Malnutrition
Pain
Fatigue
Sleep disruption

Reserve

Normal
Performance

Frailty

Functional
Decline

Disability

Reserve

Adapted from Hubbard et al. 2015



Frailty is dynamic and potentially reversible.



UNMC Transplant Optimization

	Baseline (N=18)	Day 100 (N=10)
Fried Frailty Pre-frail: 1-2 Frail: 3-5	41.2% 17.6%	55.6% 22.2%
Activities of Daily Living 1 or more impairment	5.9%	44.4%
Instrumental Activities of Daily Living 1 or more impairment	11.8%	33.3%
Short Physical Performance Battery (SPPB) SPPB ≤ 9 At risk for functional decline	29.4%	33.3%



Expert Consensus on Interventions (Morley et al. 2013)

- **Exercise (resistance and aerobic)**
- **Caloric and protein support**
- **Vitamin D**
- **Minimize polypharmacy**
- **Address geriatric syndromes
(depression, falls)**
- **Manage comorbidities**



Moderate intensity physical activity improves multiple characteristics of frailty

Country	N	Fatigue	Physical activity	Strength	Endurance
Australia	2		X	X	X
Germany	3	X	X	X	X
Netherlands	1	X	X	X	
USA	4	X	X	X	X

*Mean age 50 years and above.

*Autologous and allogeneic



Moderate intensity physical activity is feasible and beneficial in unfit patients

Author	N	Frailty	Intervention	Improved Outcomes
Klepin *Mean age >60 years	24	Strength Flexibility Aerobic	Newly diagnosed AML with low physical function.	QOL (P: 0.02) Depression (P: 0.02) Physical function* clinically significant benefit.
Wiskemann	105	Endurance Strength	Before, during and after HCT. Partly self- administered	Fit patients lost 4% while unfit patients <u>gained</u> 13% of walking capability (P: <0.05).

(Klepin et al. 2011, Wiskemann et al. 2014)



Our Experience

Where do you start?



Recognize the clinical syndrome

- **Unintentional weight loss**
- **Low physical activity**
- **Weakness**
- **Slow gait**
- **Self-reported exhaustion**



Assess functional mobility

- **Capacity: Observation and objective performance.**
- **Actual performance: What are their daily activities? Within the home and outside?**
- **Barriers and motivations**



Objective Measures

- **Short physical performance battery (SPPB)**
- **Timed up and go (TUG)**
- **Gait speed**



Short physical performance battery (SPPB)

- **Balance, gait speed, strength and endurance (5-10 minutes)**
- **A score of <9: at risk for functional decline**
- **Impaired physical function and survival in AML: HR 2.2 [CI:1.1,4.6]**
- **Baseline depression and cognitive impairment is associated with greater decline in physical function.**

(Klepin et al 2011, 2016)



Risk of Functional Decline

SPPB >9

LOW

SPPB 7-9

MODERATE

SPPB <7

HIGH



Tailor support for physical activity

Exercise counseling and tailored plan

Low risk: Home based or Fitness center

**Moderate risk:
+/- Supervision**

**High risk:
Supervision**

**Geriatric Syndromes
(Falls, Depression)**

**Active Engagement of
Patient and Family**



Take Home Points

- **Recognize the clinical syndrome of frailty**
- **Benefit of physical activity before, during and after transplant.**
- **Integration of physical activity promotion into care takes team work.**



References

1. Hubbard JM, Jatoi A. Incorporating biomarkers of frailty and senescence in cancer therapeutic trials. *The journals of gerontology Series A, Biological sciences and medical sciences*. 2015;70(6):722-8. Epub 2014/04/29. doi: 10.1093/gerona/glu046. PubMed PMID: 24770389.
2. Fried LP, Tangen CM, Walston J, Newman AB, Hirsch C, Gottdiener J, Seeman T, Tracy R, Kop WJ, Burke G. Frailty in older adults: evidence for a phenotype. *The Journals of Gerontology Series A: Biological Sciences and Medical Sciences*. 2001;56(3):M146-M57.
3. Arora M, Bhatia S, DeFor TE, Nayar M, Belete H, Lund T, Thyagarajan B, Ustun C, Weisdorf D. Impact of Frailty on Hematopoietic Cell on Early Transplant Outcomes in Older Recipients. *Am Soc Hematology*; 2015.
4. Arora M, Sun C-L, Ness KK, Teh JB, Wu J, Francisco L, Armenian SH, Schad A, Namdar G, Bosworth A. Physiologic frailty in nonelderly hematopoietic cell transplantation patients: results from the bone marrow transplant survivor study. *JAMA oncology*. 2016;2(10):1277-86.
5. Morley JE, Vellas B, van Kan GA, Anker SD, Bauer JM, Bernabei R, Cesari M, Chumlea WC, Doehner W, Evans J, Fried LP, Guralnik JM, Katz PR, Malmstrom TK, McCarter RJ, Gutierrez Robledo LM, Rockwood K, von Haehling S, Vandewoude MF, Walston J. Frailty consensus: a call to action. *Journal of the American Medical Directors Association*. 2013;14(6):392-7. Epub 2013/06/15. doi: 10.1016/j.jamda.2013.03.022. PubMed PMID: 23764209; PMCID: PMC4084863.
6. Klepin HD, Danhauer SC, Tooze JA, Stott K, Daley K, Vishnevsky T, Powell BL, Mihalko SL. Exercise for older adult inpatients with acute myelogenous leukemia: A pilot study. *Journal of geriatric oncology*. 2011;2(1):11-7. Epub 2011/01/01. doi: 10.1016/j.jgo.2010.10.004. PubMed PMID: 23843929; PMCID: PMC3703780.
7. Wiskemann J, Dreger P, Schwerdtfeger R, Bondong A, Huber G, Kleindienst N, Ulrich CM, Bohus M. Effects of a partly self-administered exercise program before, during, and after allogeneic stem cell transplantation. *Blood*. 2011;117(9):2604-13. Epub 2010/12/31. doi: 10.1182/blood-2010-09-306308. PubMed PMID: 21190995.
8. Wiskemann J, Kuehl R, Dreger P, Schwerdtfeger R, Huber G, Ulrich CM, Jaeger D, Bohus M. Efficacy of exercise training in SCT patients--who benefits most? *Bone Marrow Transplant*. 2014;49(3):443-8. Epub 2013/12/10. doi: 10.1038/bmt.2013.194. PubMed PMID: 24317122.
9. Klepin HD, Geiger AM, Tooze JA, Kritchevsky SB, Williamson JD, Pardee TS, Ellis LR, Powell BL. Geriatric assessment predicts survival for older adults receiving induction chemotherapy for acute myelogenous leukemia. *Blood*. doi: 10.1182/blood-2012-12-471680.
10. Klepin HD, Tooze JA, Pardee TS, Ellis LR, Berenzon D, Mihalko SL, Danhauer SC, Rao AV, Wildes TM, Williamson JD, Powell BL, Kritchevsky SB. Effect of Intensive Chemotherapy on Physical, Cognitive, and Emotional Health of Older Adults with Acute Myeloid Leukemia. *Journal of the American Geriatrics Society*. 2016;64(10):1988-95. Epub 2016/10/21. doi: 10.1111/jgs.14301. PubMed PMID: 27627675; PMCID: PMC5072995.



Put some spring in
your step!

STAY ACTIVE



Side Arm Raise

TARGETED MUSCLES: Shoulders

WHAT YOU NEED: Hand-held weights



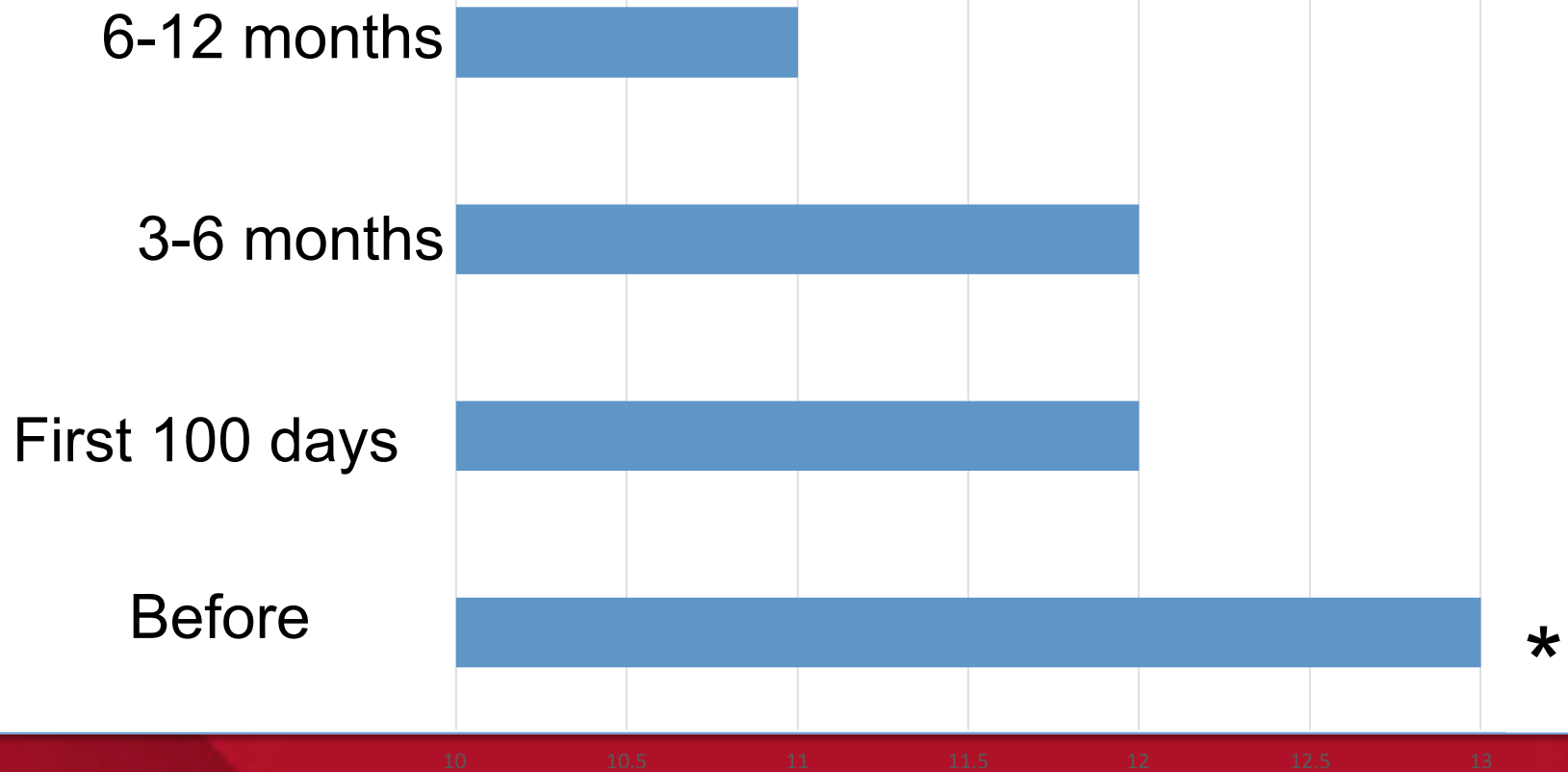
This exercise will strengthen your shoulders and make lifting groceries easier.

- 1.** You can do this exercise while standing or sitting in a sturdy, armless chair.
- 2.** Keep your feet flat on the floor, shoulder-width apart.
- 3.** Hold hand weights straight down at your sides with palms facing inward. Breathe in slowly.
- 4.** Slowly breathe out as you raise both arms to the side, shoulder height.
- 5.** Hold the position for 1 second.
- 6.** Breathe in as you slowly lower your arms.
- 7.** Repeat 10-15 times.
- 8.** Rest; then repeat 10-15 more times.

TIP: As you progress, use a heavier weight and alternate arms until you can lift the weight comfortably with both arms.

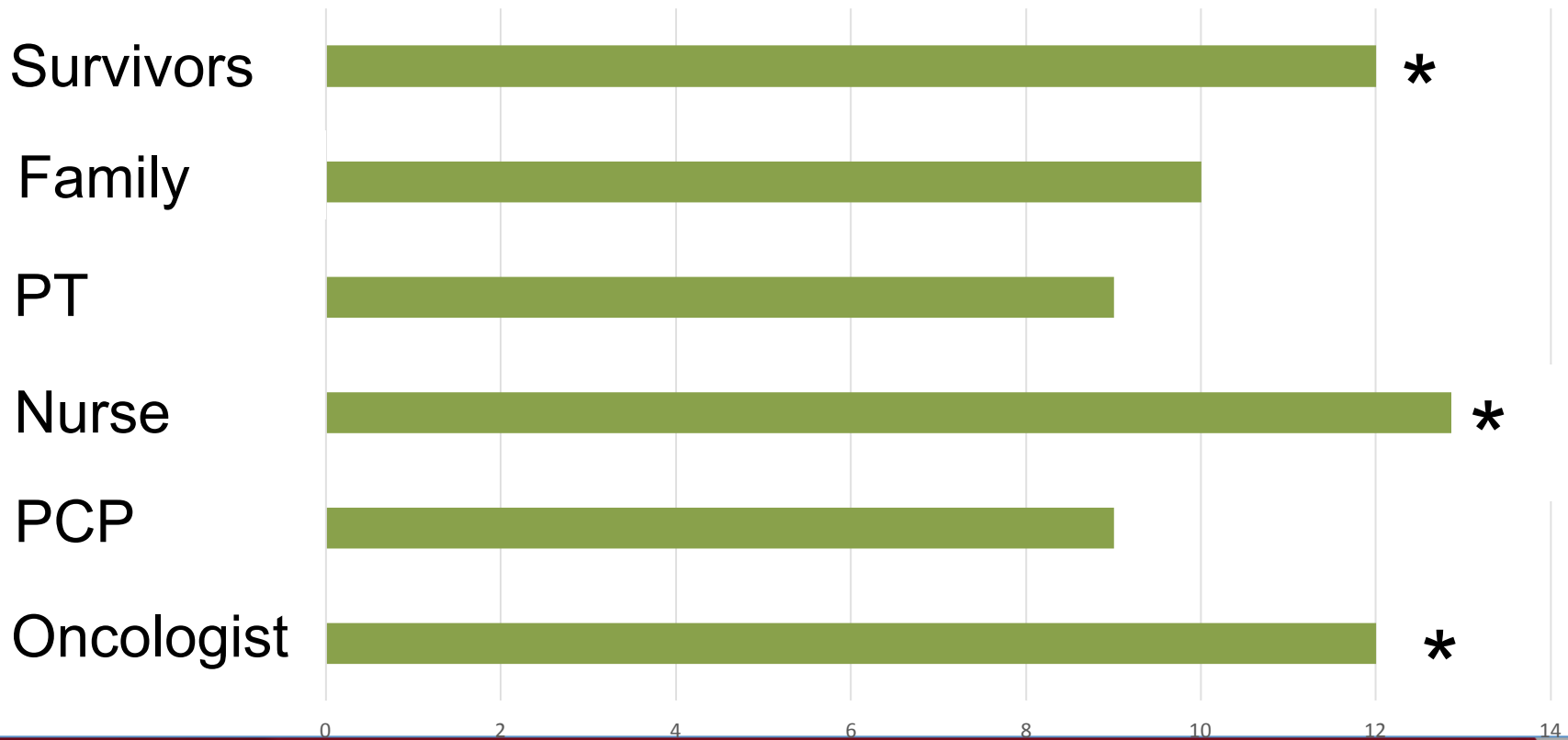
Patient Preferences

Counseling Timing



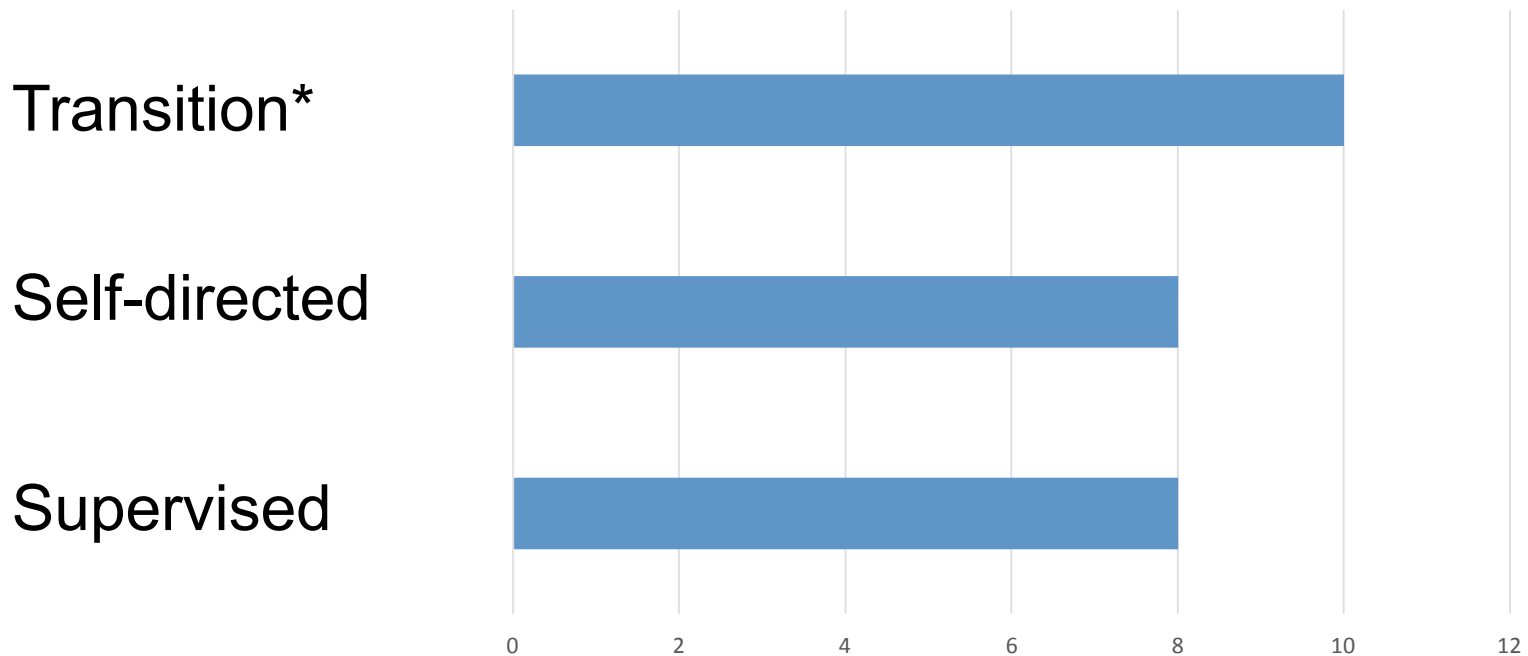
Patient Preferences

Counseling Delivery



Patient Preferences

Program Structure



* Supervised transition to unsupervised



Frailty in Transplant (Arora et al. 2016)

- **Prevalence of 8% (Mean age of 42 years)**
- **8.4 times more likely to be frail than their age-matched siblings**
- **Frailty was associated with reduced survival OR 2.76 [CI: 1.7, 4.4]**

