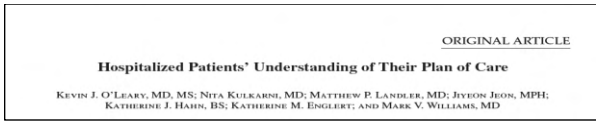


ORIGINAL ARTICLE

Hospitalized Patients' Understanding of Their Plan of Care

KEVIN J. O'LEARY, MD, MS; NITA KULKARNI, MD; MATTHEW P. LANDLER, MD; JIYEON JEON, MPH; KATHERINE J. HAHN, BS; KATHERINE M. ENGLERT; AND MARK V. WILLIAMS, MD

CONCLUSION: **A substantial portion of hospitalized patients do not understand their plan of care. Patients' limited understanding of their plan of care may adversely affect their ability to provide informed consent for hospital treatments and to assume their own care after discharge.**

O'Leary K et al. Hospitalized Patients' Understanding of their Plan of Care. Mayo Clin Proc 2010;85(1):47-52.

JAMA Internal Medicine

Formerly *Archives of Internal Medicine*

Quality of Discharge Practices and Patient Understanding at an Academic Medical Center

Leora I. Horwitz, MD, MHS[1,2]; John P. Moriarty, MD[1]; Christine Chen, MD[3]; Robert L. Fogerty, MD, MPH[1]; Ursula C. Brewster, MD[4]; Sandhya Kanade, MD[3]; Boback Ziaeian, MD[5]; Grace Y. Jenq, MD[6]; Harlan M. Krumholz, MD, SM[2,7,8,9]

JAMA Intern Med. 2013;173(18):1715-1722.

Results The 395 enrolled patients (66.7% of those eligible) had a mean age of 77.2 years. Although 349 patients (95.6%) reported understanding the reason they had been in the hospital, only 218 patients (59.6%) were able to accurately describe their diagnosis in postdischarge interviews. Discharge instructions

Risks of Transitions

- Adverse drug events
  - Number of meds, types of meds, number of transitions, adherence post-discharge
- Missed results from pending tests
  - Documentation, communication, awareness
- Lack of appropriate follow-up
  - Documentation, time to follow-up

Components of an Effective Transition

- **Communication between sending & receiving providers**
- **Medication reconciliation**
- **Preparation of patient & caregiver**
- **Communication re: contingencies**
- **Follow-up plan for pending tests**
- **Plan for follow-up appointment**

References

- Bonaudo M, et al. Medication discrepancies across multiple care transitions: A retrospective longitudinal cohort study in Italy. PLOS One 2018; 13(1): e0191028.
- Coleman EA. Falling Through the Cracks: Challenges and Opportunities for Improving Transitional Care for Persons with Continuous Complex Care Needs. J Am Geriatr Soc 2003;51(4):549-555.
- Coleman E, Min S, Chomiak A, Kramer A. Posthospital Care Transitions: Patterns, Complications, and Risk Identification. Health Serv Res 2004;39(5):1449-1466.
- Cook R, Render M, Woods D. Gaps in the continuity of care and progress on patient safety. BMJ 2000;320:791-4.
- Kosecoff J, Kahn KL, Rogers WH, et al. Prospective payment system and impairment at discharge. The 'quicker-and-sicker' story revisited. JAMA 1990;264(15):1980-3.
- Institute of Medicine. Crossing the Quality Chasm: a New Health System of the 21st Century. Washington, DC; National Academy Press, 2001.
- Thomas E.J., et al. Incidence and types of adverse events and negligent care in Utah and Colorado. Med Care 2000;38:261-71.
- Leape L.L. et al. The nature of adverse events in hospitalized patients. Results of the Harvard Medical Practice Study. NEJM 1991;324:377-384.
- Forster A, Murff H, Peterson JF, et al. The Incidence and Severity of Adverse Events Affecting Patients after Discharge from the Hospital. Ann Intern Med 2003;138(3):161-7.
- Forster A, Clark H, Menard A, et al. Adverse events among medical patients after discharge from hospital. CMAJ 2004;170(3):345-9.
- Moore C, Wisniveskky J, Williams S, et al. Medical Errors Related to Discontinuity of Care from an Inpatient to an Outpatient Setting. J Gen Intern Med 2003;18:646-51.
- Doctoroff L, McNally D. Handoffs in Hospital Medicine. Hosp Med Clinic 3 (2014): e1-14.
- Forster A, Murff H, Peterson J, et al. Adverse Drug Events Occurring Following Hospital Discharge. J Gen Intern Med 2005;20:317-23.
- Kripalani S, Price M, Vigil V, et al. Frequency and Predictors of Prescription-Related Issues after Hospital Discharge. Journal of Hospital Medicine 2008;3:12-19.

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

References

- Coleman E, Smith J, Raha D, et al. Posthospital Medicine Discrepancies. Ach Intern Med 2005;165:1842-1847.
- Sinvani L, et al. Medication Reconciliation in Continuum of Care Transitions: A Moving Target. JAMDA 2013;14:668-672.
- Roy C, et al. Patient Safety Concerns Arising from Test Results That Return after Hospital Discharge. Ann Intern Med 2005;143:121-8.
- Walz S, Smith M, Cox E, et al. Pending Laboratory Tests and the Hospital Discharge Summary in Patients Discharged to Sub-Acute Care. J Gen Intern Med 2010;26(4):393-8.
- Moore C, McGinn T, Halm E. Tying Up Loose Ends. Arch Intern Med 2007;167:1305-1311.
- Misky G, Wald H, Coleman E. Post-Hospital Transitions: Examining the Effects of Timing of Primary Care Provider Follow-up. Journal of Hospital Medicine 2010;5:392-7.
- Jencks S, Williams M, Coleman E. Rehospitalizations among patients in the Medicare Fee-for-Service Program. NEJM 2009;360:1418-28.
- Makaryus AN, Friedman EA. Patients' understanding of their treatment plans and diagnosis at discharge. Mayo Clin Proc 2005;80(8):991-4.
- O'Leary K et al. Hospitalized Patients' Understanding of their Plan of Care. Mayo Clin Proc 2010;85(1):47-52.
- Horwitz et al. Quality of Discharge Practices and Patient Understanding at an Academic Medical Center. JAMA 2013;173(18):1715-22.
- Hansen L, Young R, Hinami K, Leung A, Williams M. Interventions to Reduce 30-Day Rehospitalization: A Systematic Review. Ann Intern Med 2011;155:520-528.
- Rennke S, Nguyen O, Shoeb M, Magan Y, Wachter R, Ranji S. Hospital-Initiated Transitional Care Interventions as a Patient Safety Strategy. Ann Intern Med 2013;158:433-440.

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Beth Israel Deaconess Medical Center

HARVARD MEDICAL SCHOOL TEACHING HOSPITAL

ECHO-Care Transitions: Past, Present and Future

Amber Moore, MD, MPH
Co-Director, ECHO-CT
Hospitalist, Beth Israel Deaconess Medical Center
Instructor of Medicine, Harvard Medical School

The ECHO Model

Project ECHO

UNM SCHOOL OF MEDICINE

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

The ECHO Act

- 2016 mandate by congress stating that the secretary of health

workforce issues.

Why Transitions to Post-Acute Care?

- Adverse health outcomes are tied to poor quality transitions, including inconsistencies with medications and follow-up care
- Older adults account for the largest percentage of transfers to post-acute care facilities.
- Post-acute care providers receive little to no verbal sign-out, and rely on discharge documentation of varying quality that is not standardized.
- Buy-in from department leadership

Program Structure

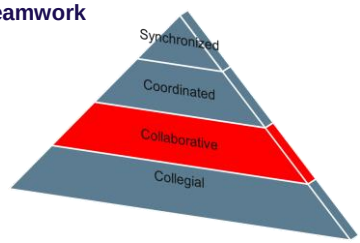
- Weekly video conferences designed to improve transitions of care from acute care to skilled nursing facilities (SNF).
- The inter-professional hospital team includes hospital medicine, geriatrics, pharmacy, social work, primary care provider, inpatient care team, medicine residents
- SNF team includes doctors, nurses, physical therapy, occupational therapy, social work
- Funding:
  - Reynolds Foundation (July 2013 June 2017)
  - Hospital funded (July 2017-Sept 2018)
  - AHRQ (October 2018-present)

Key Objectives

- Create a collaborative multidisciplinary, team based learning community
- Provide peer support
- Improve patient care, quality and cost outcomes

collaborative, multidisciplinary conversation, new solutions emerge that no one provider may come

Stages of Teamwork



An Optimized Team

Relational Coordination
Shared Goals
Shared Knowledge
Mutual Respect
Communication: Frequent
Communication: Accurate
Communication: Timely
Communication: Problem-Solving

Multidisciplinary, Bidirectional, Problem-solving Communication Flow

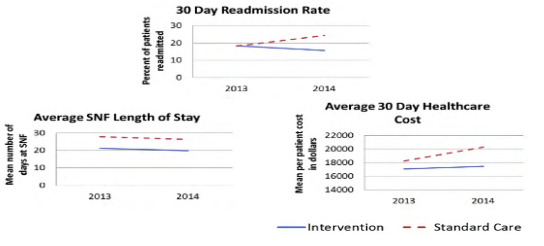
ECHO - CT Educational Impact

- Hundreds of residents have participated in an ECHO-CT clinic
- Residents and hospitalists demonstrated an improvement in knowledge about transitions and also showed significant improvements in skill
- SNF staff self reported improved knowledge

ECHO-CT Outcomes

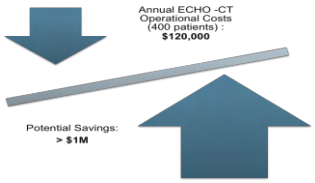
- 30 Day Mortality Rates
- 30 Day Readmission Rates
- Total cost of health care during 30 day period post discharge
- Length of Stay in Post-Acute Care Facility

ECHO-CT Outcomes



Moore et al., AJM 2017

Return on Investment



Lessons Learned

Next Steps

Facilitator Scorecard

Please rate the following statements below on today's session(s):
1 = Always
2 = Usually
3 = About half the time
4 = Seldom
5 = Never

	Always	Usually	About half the time	Seldom	Never
1. Starts session on time					
2. Ensures that all participants introduce themselves and identifies who will be leading the conf when resident is present					
3. Reminds participants to maintain confidentiality and use the ECHO ID when discussing patients (if needed)					
4. Summarizes patient case presentation in 2 to 3 sentences.					
5. Allows SNF clinicians time to discuss patients current state					

1. For each of the following statements, please select one response from the given options that best reflects your opinion averaged over your entire ECHO-CT experience.

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The outcomes of ECHO-CT conferences are worth the time commitment.					
Having a multidisplinary team participate in the conferences makes them more effective.					
My feedback on the **BIDMC discharge process** is welcomed.					
My feedback on the **ECHO-CT program** is welcomed.					

ECHO CT Session Video

We will take a break for the next 15 minutes.
Please return at 10:00.

Logistics for ECHO-CT Session

Pre-Session Weekly Process

- Each site has designated a point person who will be completing the pre-session activities
- Pre-Session Activities include: confirming patients to be discussed that week and sending BI intake forms and medication lists for each patient
- The process for preparing for a session begins two days before the session.
  - **BI Boston Sites - Your Session is on Thursday so the preparations start on Tuesday**
  - **BI Needham Sites - Your session is on Wednesday so the preparations start on Monday**
- **Note about Attendance: It is very important that facilities attend every week (unless they don't have any patients that week). If someone is going to be unable to facilitate the session or any of the pre-session activities, please let Lauren know ASAP.**

Two Days before the Session

1. **The point person at each SNF will receive a secure email from me with a list of patients to be discussed that week.**
2. **The point person needs to confirm that all the patients on the list are still at the facility and that your team wishes to discuss them.**
3. **What type of patients do we discuss?**
   The only patients we exclude are long term care patients and those who are already discharged.
   We encourage sites to discuss ALL patients, even those who don't seem complex
4.

ECHO Care Transitions
Intake Form

Date of Presentation: **ECHO Patient ID#:**

Skilled Nursing Facility:

SNF Presenter Name:

1) What issues/concerns do you have about the transition from BIDMC to your facility? Please describe below.
   - ☐None
   - ☐Medication related (specify):
   - ☐Treatment related (specify):
   - ☐Other (specify):
2) Do you have any medical or treatment-related concerns that have occurred since you admitted the patient that you would like to discuss? Please describe below.
3) Is there an anticipated Discharge Date? ☐Yes ☐No If Yes, When?
4) What concerns do you have for this patient as they transition from your facility back to home? Please describe below.

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

One Day Before Session

5 

The point person at each SNF will need to fill out the intake form and send it with each patient's medication list. These item will be sent through secure fax.

This needs to happen before 3:00pm on the day before the session

What happens next?

From here, the pharmacist will reconcile the home, hospital and SNF meds- looking for any discrepancies

The hospitalist facilitators and social worker will review the case and prepare any questions in advance of the session.

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Google Meet

- Through a BAA with Google, BIDMC can in a safe and HIPPA compliant way, use Google Meet for these conferences.
- Each week the same login information will be used. This information has already been sent to your sites.
- We encourage the use of video conferencing because it promotes a more engaging and collaborative environment. However, there is a phone call in number as back-up.
- We do have cameras and microphones available if your site needs one.
- IT support available as needed

DEMO:
meet.google.com/pqr-ijtn-euo
(US) +1 724-542-5258
PIN: 353 672 415#

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

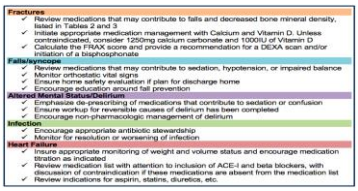
Conference Structure

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Structure of Patient Discussion

1) Hospitalist facilitator gives case summary
2) SNF gives overview of current condition and raises questions/concerns
3) Case discussion
4) Discharge Plan
5) Areas for Improvement

Disease Specific Checklists



Fractures
- ✓ Review medications that may contribute to falls and decreased bone mineral density, listed in Tables 2 and 3
- ✓ Initiate appropriate medication management with Calcium and Vitamin D. Unless contraindicated, consider 1250mg calcium carbonate and 1000IU of Vitamin D
- ✓ Calculate the FRAX score and provide a recommendation for a DEXA scan and/or initiation of a bisphosphonate

Falls/syncope
- ✓ Review medications that may contribute to sedation, hypotension, or impaired balance
- ✓ Monitor orthostatic vital signs
- ✓ Ensure home safety evaluation if plan for discharge home
- ✓ Encourage education around fall prevention

Altered Mental Status/Delirium
- ✓ Emphasize de-prescribing of medications that contribute to sedation or confusion
- ✓ Ensure workup for reversible causes of delirium has been completed
- ✓ Encourage non-pharmacologic management of delirium

Infection
- ✓ Encourage appropriate antibiotic stewardship
- ✓ Monitor for resolution or worsening of infection

Heart Failure
- ✓ Insure appropriate monitoring of weight and volume status and encourage medication titration as indicated
- ✓ Review medication list with attention to inclusion of ACE-I and beta blockers, with discussion of contraindication if these medications are absent from the medication list
- ✓ Review indications for aspirin, statins, diuretics, etc.

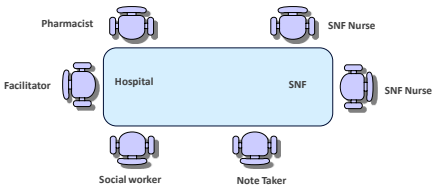
Video

Mock ECHO-CT Session

Mock Session Instructions: Roles

1. In your folders, you will find that each of you has been assigned a role. This may not be your usual organizational role.
2. Each role includes objectives and a process to follow, please read your roles carefully.
3. There may be two people assigned to the same role in your group. Prior to the start of the session, we suggest that you discuss the issues together and then have one person be the main speaker during the session.
4. The facilitator (s) will lead off the discussion.
5. The ECHO-CT process flow (included w/ your role) will walk you through how to run the session.
6. You will have a BI Staff member to observe/ offer help if needed!

Mock Session Instructions: Roles



Mock Session Instructions: The Case & Objectives

1. In each of your folders, you will find case details.
   The case details include:
   - Overview of patient's hospital stay (overview, acute issues, transitional issues)
   - Follow up appointments
   - Medication lists

2. This case involves a lot of the typical issues that we see during the ECHO-CT sessions. **Your objective is to identify as many of the issues as you can.**

The patient:
77 male who presents to the ED on 3/13/2019 with report of a fall. Notes he slipped down on the ground for 30 minutes until he got help getting up. He attempted to stretch out his arms to break his fall, but did hit the front of his head. While in the hospital he was found to have urosepsis and acute kidney injury. He was discharged to a SNF on 3/22/2019.

Mock Session Instructions: Schedule

11:05-11:15: read case details, if there are two people in one role you should discuss the case and decide what issues you want to address and which of you will play the role during the mock session

11:15-11:30: Mock case

11:30-11:40: debrief in small group with note-taker commenting on what they observed

11:40-11:50: reconvene as a large group to share lessons

11:50-12:00: wrap up and next steps

Mock Session Instructions: Tips & Tricks

1. When reading over the case, note the things that may be most important to your specific role.
2. Just like in real life, the hospital side and the SNF side have been given different types of information.
3. Follow along with the ECHO-CT process flow document.

Group #	Location	BI Team Helper
Team 1	Grand Canyon Room	Amber
Team 2	Main Room	Lew
Team 3	Haleakala Room	Lauren
Team 4	Main Room	Anita

Mock Session Issues:

1. Discharge summary is unclear as to what antibiotic patient should be taking (states patient should be discharged on Ceftriaxone but patient is actually discharged on Cipro)
2. Appears that antibiotic was stopped prematurely as discharge summary states to continue through 3/27 however SNF team reports that it was stopped on 3/23 – discussion of appropriateness of stopping early, consideration of blood cultures to confirm resolution given that antibiotics were stopped several days before the conference occurred
3. Might recommend discontinuing Metformin due to creatinine level
4. Patient has urology appointment on 4/2, SNF unaware
5. The inpatient team's assessment of the cause of the fall and work-up is not clearly outlined in the dc summary—may have been missed workup.
6. Discussion of need to restart Hydrochlorothiazide 25mg, titrate BP meds given borderline low BP
7. Discussion of anticipated discharge date, barriers to discharge, discharge location (potentially cannot return to assisted living due to blindness, falls, dementia)

Mock Session Debrief

1. How did your teams address discrepancies in the care plan?
2. How did your team facilitate respect and teamwork?

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center

Wrap-up & Next Steps

- The program officially begins next week!
  - **Needham Sites:** Your first session will be on Wednesday April 3rd
  - **Boston Sites:** your first session will be on Thursday, April 4th
- All of the logistics information covered today has been sent to your sites.
- If you have any lingering questions, need IT support or other information please see Lauren after.

Beth Israel Lahey Health
Beth Israel Deaconess Medical Center


Thank
You

Please Fax to ****

ECHO Care Transitions
Intake Form

Date of Presentation: **ECHO Patient ID#:**

Skilled Nursing Facility:

☐

SNF Presenter Name:

1) What issues/concerns do you have about the transition from *hospital* to your facility? Please describe below.

   ☐None

   ☐Medication related (specify):

   ☐Treatment related (specify):

   ☐Other (specify):

2) Do you have any medical or treatment-related concerns that have occurred since you admitted the patient that you would like to discuss? Please describe below.

3) Is there an anticipated Discharge Date? ☐Yes ☐No If Yes, When?

4) What concerns do you have for this patient as they transition from your facility back to home? Please describe below.

CASE DETAILS TEMPLATE

Time	ECHO ID	MRN	ECF Location	Admit Date	Disch Date	Admitting Diagnosis	PCP	BIDMC Attending

Overview:
Click here to enter text.

Acute Issues:
Click here to enter text.

Chronic Issues:
Click here to enter text.

Transitional Issues: Click here to enter text.
Follow Up: Click here to enter text.

Facilitator Scorecard

Please rate the following statements below on today's session(s): **1 = Always** **2 = Usually** **3 = About half the time** **4 = Seldom** **5 = Never**	**Yes/No**	**Always**	**Usually**	**About half the time**	**Seldom**	**Never**
1. Starts session on time						
2. Ensures that all participants introduce themselves and identifies who will be leading the conf when resident is present						
3. Reminds participants to maintain confidentiality and use the ECHO ID when discussing patients (if needed)						
4. Summarizes patient case presentation in 2 to 3 sentences.						
5. Allows SNF clinicians time to discuss patients current state						
6. Encourages participation by asking open ended questions						
7. The facilitator engages all group members i.e. pharmacy, social work etc.						
8. Ensures that words like " consider" or "recommend" are used when providing recommendations						
9. The facilitator keeps the session on track by managing time, providing coaching or guidance as needed						
10. Facilitator gently redirects when the conversation is off topic or over time.						
11. Requests feedback from participants at the SNF (both transition feedback and ECHO feedback)						
12. Manages SNF time slot transitions or multiple people on the line (time goes over, PCP calls in)						
13. Instructs and coaches residents/trainees on ECHO-CT process (if applicable)						
14. Creates supporting learning environment by engaging and listening to peers						
15. Uses downtime to teach general principles related to clinical care or transitions of care						
16. Ends on time						
17. Completes any necessary patient follow up that came out of session						
18. Completes any necessary study documentation (clinical issues, AEs, primary diagnoses)						
19. Completes patient notes in OMR						

Comments:

SNF Satisfaction Survey

1. I am allotted sufficient time to present my patient(s) during an ECHO-CT conference

Strongly Agree
Agree
Disagree
Strongly Disagree

2. Participating in the ECHO-CT Session does not disrupt the flow of my day.

Strongly Agree
Agree
Disagree
Strongly Disagree

3. There is a clear process for discussing patients during the ECHO-CT conference.

Strongly Agree
Agree
Disagree
Strongly Disagree

4. There is a clear process for patient follow up after ECHO-CT conferences.

Strongly Agree
Agree
Disagree
Strongly Disagree

5. The outcomes of ECHO-CT conferences are worth the time investment.

Strongly Agree
Agree
Disagree
Strongly Disagree

6. Having a multidisciplinary team participate in the conferences makes them more effective.

Strongly Agree
Agree
Disagree
Strongly Disagree

7. Once the project is over, I would participate in the ECHO-CT conferences again.

Strongly Agree
Agree
Disagree
Strongly Disagree

8. ECHO-CT conferences offer me added value over resources I already have access to.

Strongly Agree
Agree
Disagree
Strongly Disagree

9. Listening in on other facilities ECHO-CT cases is a useful learning tool

Strongly Agree
Agree
Disagree
Strongly Disagree

10. ECHO-CT conferences are an effective way to address communication gaps in the transition of the care process

Strongly Agree
Agree
Disagree
Strongly Disagree

11. At ECHO-CT conferences I learn information that I can apply to my general clinical practice.

Strongly Agree
Agree
Disagree
Strongly Disagree

12. My facility has incorporated advice from ECHO-CT conferences into treatment plans for patients

Strongly Agree
Agree
Disagree
Strongly Disagree

13. ECHO-CT conferences have helped me to provide better patient care.

Strongly Agree
Agree
Disagree
Strongly Disagree

14. My feedback on the hospital discharge process is welcomed.

Strongly Agree
Agree
Disagree
Strongly Disagree

15. I feel supported by the ECHO-CT team in my clinical practice.

Strongly Agree
Agree
Disagree
Strongly Disagree

16. Having access to clinicians from the hospital is important to me

Strongly Agree
Agree
Disagree
Strongly Disagree

17. Problems with connecting to the hospital team during the ECHO-CT conferences significantly reduce the conference's impact

Strongly Agree
Agree
Disagree
Strongly Disagree

18. I feel comfortable presenting cases in video-conferencing format.

Strongly Agree
Agree
Disagree
Strongly Disagree

19. The video conference format adds value over other forms of communication (phone call, email etc.)

Strongly Agree
Agree
Disagree
Strongly Disagree

20. ECHO-CT conferences are collaborative.

Strongly Agree
Agree
Disagree
Strongly Disagree

21. I feel that my input is valued in ECHO-CT conferences.

Strongly Agree
Agree
Disagree
Strongly Disagree

22. The number of patients discussed during the conference is … (Sliding Scale Question)

Too Few Correct Amount Too Many

23. Do you feel like the appropriate providers are attending the conference? (Yes/No Question)
24. If not, what type of providers should attend? (Comment Box/Open Ended)

25. What is the greatest benefit of ECHO-CT conferences? (Comment Box/Open ended)

26. What is the greatest drawback of ECHO-CT conferences? (Comment Box/Open Ended)

27. How could the conferences be improved?

Frailty and Transition of Care for Hospitalized Older Adults

ECHO-CT Webinar

Dae Kim, MD, MPH, ScD
Assistant Professor of Medicine, Harvard Medical School
Marcus Institute for Aging Research, Hebrew SeniorLife
Division of Gerontology, Dept of Medicine, BIDMC
Division of Pharmacoepidemiology, Dept of Medicine, BWH
dkim2@bidmc.harvard.edu

Disclosures and funding

! **Research grants:**
" NIA R01AG056368, R01AG062713, R21AG060227
" Paul B. Beeson Clinical Scientist Development Award in Aging (K08AG051187)
" KL2 Harvard Catalyst MeRIT Award (NIH 1KL2 TR001100-01)
" Boston Older American Independence Center Pilot Award (NIA P30 AG031679)
" Boston Roybal Center Pilot Award (NIA P30 AG048785)

! **I have no financial relationships with a commercial entity producing healthcare-related products and/or services.**

Goals and objectives

After participating in this activity, you will be able to

! Define frailty using commonly used frailty definitions

! Perform a brief screening test of frailty

! Interpret the results of comprehensive geriatric assessment-based frailty index

! Develop a transition-of-care plan for medically complex older adults based on frailty assessment

94-yo man with fall and fracture

! Fall, resulting in 4 rib fractures (concern for flail chest) and vertebral fracture

! PMH: AF on warfarin, COPD, hypothyroidism, PE, BPH, HTN, HFpEF, CAD, anemia, valvular heart disease (s/p mitraclip)

! Hospital course: ICU admission for respiratory monitoring
" Pain control: APAP, hydromorphone PRN, oxycodone PRN
" Tachycardia (due to AF), fatigue

! Prior to admission: lives with wife at home; use a rollator; ADLs independent; IADLs help with housekeeping

! Inpatient functional change: impaired safety awareness, requires assistance with functional mobility

! Discharged to rehab on hospital day 4

89-yo woman with pneumonia and AF

- Fell at home, unable to get up; pneumonia and new-onset AF with RVR
- PMH: depression, weight loss (>10 lbs), osteoporosis, incontinence, syncope, recurrent falls, macular degeneration
- Hospital course: IV antibiotics, metoprolol and apixaban for AF, straight cath PRN for urinary retention, delirium
- Prior to admission: live alone independently (ADL/IADL)
- Inpatient functional change: loss in endurance, mobility, and self-care ability
- Discharge to rehab on hospital day 12

5

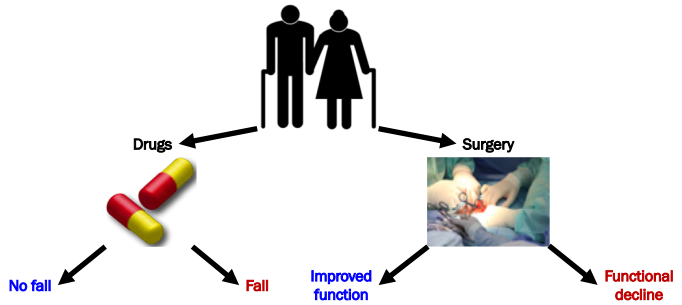
Part 1: Overview of frailty

6

What is frailty?

7

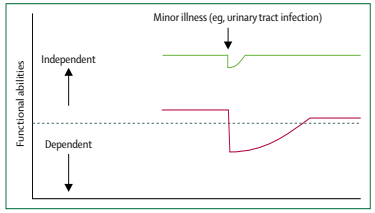
Same treatment, different outcomes: some patients are more prone to poor outcomes

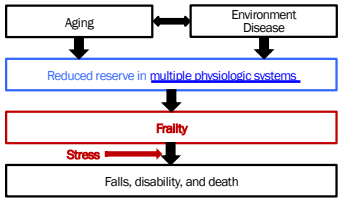


8

Frailty: a geriatric syndrome underlying heterogeneity

- A state of reduced physiologic reserve to maintain homeostasis (homeostenosis)
- Increased vulnerability to poor health outcomes after a stressor
- Manifestation: fatigue, weight loss, falls, delirium, and fluctuating disability





Clegg et al. Lancet 2013; 381: 752-62

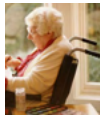
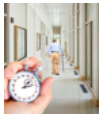
Frailty prevalence and outcomes

- Frailty affects one in every 10 community-dwelling older adults and one in every 2 nursing home residents.
- Frailty prevalence is higher with advancing age and in women.
- Frailty is a risk factor for adverse health outcomes, independently of demographic characteristics and comorbidities.
  - Falls
  - Worsening disability
  - Hospitalization
  - Long-term care institutionalization
  - Mortality

Collard et al. J Am Geriatr Soc. 2012;60:1487-1492, Kojima. J Am Med Dir Assoc. 2015; 16: 940-945, Clegg et al. Lancet. 2013;381:752-762

Frailty phenotype (physical frailty)

- Frailty is diagnosed based on the 5 characteristics:

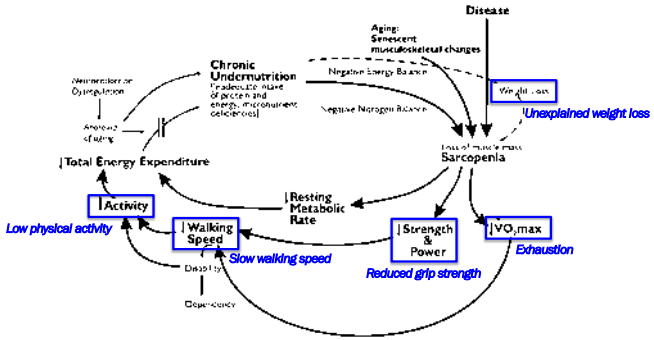
weight loss	exhaustion	inactivity	slowness	weakness
				
	(self-report)	(physical activity questionnaire)	(timed walk test)	(hand dynamometer)

- Identify a clinically recognizable group of people who have unique characteristics

Score	Classification
0	Non-frailty
1-2	Pre-frailty
3-5	Frailty

Fried et al. J Gerontol A Biol Sci Med Sci. 2001; 56: M146-56

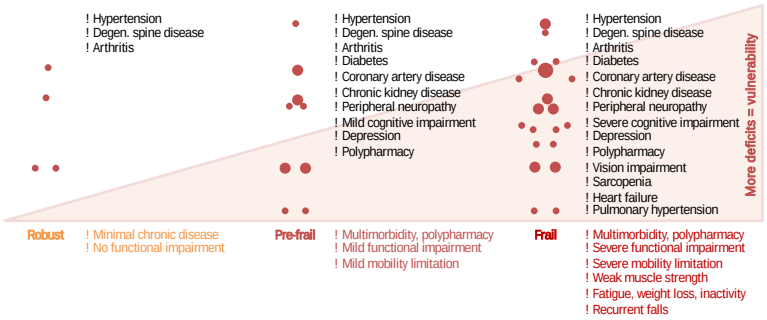
Frailty phenotype attempts to measure altered stress response and energy metabolism abnormalities



Fried et al. J Gerontol A Biol Sci Med Sci. 2001; 56: M146-56

Frailty as deficit accumulation: "The problems of old age come as a package"

(Fontana et al. Nature 2014; 511: 405-406)



Deficit-accumulation frailty index (FI)

- Frailty can be quantified as deficit accumulation.
- Proportion of deficits (range: 0 to 1): $FI = \frac{\text{n of health deficits present}}{\text{n of health deficits considered}}$
  - Need ≥30 deficit items
  - Deficits should be age-associated and acquired
    (e.g., symptoms, diagnoses, functional limitations, physical examination, diagnostic test abnormalities)
  - The overall burden is important; less emphasis on specific items
  - Increasing popularity for implementation in EHR

Score	Classification
<0.15	Non-frailty
0.15-0.24	Pre-frailty
0.25-0.34	Mild frailty
0.35-0.44	Moderate frailty
0.45-0.54	Severe frailty
≥0.55	Advanced frailty

Rockwood et al. Sci World J 2001; 1: 323-36, Rockwood et al. Clin Geriatr Med 2011; 27: 17–26

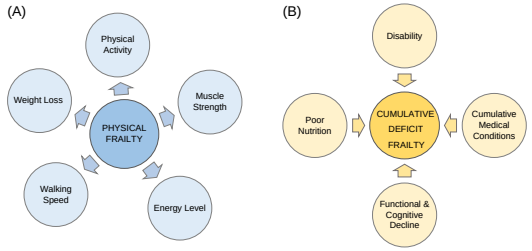
Submaximal limit of a deficit-accumulation FI

- Submaximal limit of a frailty index (typically ~0.7) indicates "very few people can survive with more than 70% deficits."

Rockwood et al. J Gerontol A Biol Sci Med Sci. 2007; 62A: M722-M727, Rockwood et al. Clin Geriatr Med 2011; 27: 17-26.

Frailty phenotype vs deficit-accumulation FI

- Correlation between the two measures: 0.65



Rockwood et al. J Gerontol A Biol Sci Med Sci. 2007;62A:M738-M743, Walston et al. J Am Geriatr Soc 2019;67:1559-1564.