6 Weeks, 6 Transitions: Lessons Learned from One Patient

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Conflict of Interest Disclosure

- I have no financial relationships with a commercial entity producing healthcare-related products and/or services.
Identify common adverse events post-discharge

Recognize the main risks of care transitions

List the components of an effective transition
Our patient: Ms. D

- 71 y/o woman who lives at home with her husband
- Originally from Ireland, came to the US at age 15
- Has been married > 50 years
- She has 4 children, 7 grandchildren, 1 great-grandchild
- Former secretary
- Uses a walker and a prosthesis at home
- Husband helps with many ADLs
Our patient: Ms. D

- **Past Medical History**
  - Diabetes mellitus
  - HTN
  - Orthostatic hypotension
  - Peripheral neuropathy
  - PVD s/p right BKA
  - Chronic back pain

- **Takes 25 different medications daily**
  - Opiates
  - Anti-HTN meds
  - Insulin pump
  - Anxiolytics
  - Antiplatelets
• Severe confusion, fall, decreased urine output over 2-3 days
• Recently started on NSAIDs for shoulder bursitis
• Brought to the ED for evaluation
• Diagnosed with acute kidney failure, hyperglycemia, severe confusion
• Admitted to the Intensive Care Unit
• Mental status slowly clears
• Kidney function improves
• Course complicated by severe high blood pressure
• Started on new anti-hypertensive agents
• Methadone started for pain control
• Insulin pump discontinued, long-acting insulin started
• Discharged to a skilled nursing facility
• Develops acute kidney failure again
• Changes to blood pressure medication regimen due to side effect
• Diagnosed with urinary tract infection, started on antibiotics
• Pain regimen changed
• Discharged to home on a Saturday
• Decreased urine output
• Two falls at home
• Slightly confused
• Noted by VNA to have “many many old meds around the house”
• Presents to the ED
• Found to be in acute kidney failure & hyperglycemic
• Admitted to Medicine
• Diagnosed with urinary retention again
• She was taking old oxycodone and morphine that she had at home
• She had re-initiated her insulin pump on her own
• Urinary retention resolves with foley placement
• Patient stabilized on long-acting insulin, methadone
• Discharged home with VNA
SIX MAJOR TRANSITIONS OVER SIX WEEKS

INDEX DIAGNOSIS:
AKI, AMS, HYPERGLYCEMIA

READMISSION DIAGNOSIS:
AKI, AMS, HYPERGLYCEMIA

10/25

11/9

12/5

HOME
ED
ICU
SNF
HOME
ED
WARDS

Hours
1.5 wks
2 days
Hours
5 days

Beth Israel Deaconess Medical Center

A teaching hospital of Harvard Medical School
How do we define Transitions in Care?

“Set of actions designed to ensure the coordination and continuity of health care as patients transfer between different locations or different levels of care within the same location”

Prevalence of Post-hospital Transitions

- Hospitalized Medicare beneficiaries
  - 73% -> HOME
  - 17% -> SNF or Acute Rehab
  - 10% -> Different hospital or within the same hospital

- Number of transfers within 30 days
  - 61% single transfer
  - 18% two transfer
  - 8.5% three transfers
  - 4.3% four or more transfers

Why is this important?

• Vulnerable time for patients
  – Shorter length of stay
  – Possible worsening of functional impairments
  – Changes in treatment regimen
  – Discontinuities during their transitions
One in five experienced an adverse event post discharge

- 50% used health services -> 24% readmitted

Adverse drug events were the most common type (66%)

- Antibiotics, steroids, CV drugs, analgesics, anticoagulants, AEDs
Medical Errors Related to Discontinuity of Care from an Inpatient to an Outpatient Setting

Carlton Moore, MD, Juan Wisnivesky, MD, Stephen Williams, MD, Thomas McGinn, MD

MAIN RESULTS: Forty-nine percent of patients experienced at least 1 medical error. Patients with a work-up error were 6.2 times (95% confidence interval [95% CI], 1.3 to 30.3) more likely to be rehospitalized within 3 months after the first association between medication continuity errors (odds ratio [OR], 2.5; 95% CI, 0.7 to 8.8) and test follow-up errors (OR, 2.4; 95% CI, 0.3 to 17.1) with rehospitalizations.

CONCLUSION: We conclude that the prevalence of medical errors related to the discontinuity of care from the inpatient to the outpatient setting is high and may be associated with an increased risk of rehospitalization.
Risks of Transitions

- Adverse drug events
- Missed results from pending tests
- Lack of appropriate follow-up
Risks of Transitions

- Adverse drug events
- Missed results from pending tests
- Lack of appropriate follow-up
87% of ADEs associated with certain meds

Almost all cases associated with new med or dose change

Risk of ADE increased with number of medications prescribed
## Discharge Medication List

<table>
<thead>
<tr>
<th>No.</th>
<th>Medication</th>
<th>Dosage</th>
<th>Route</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Calcitrate-Vitamin D (calcium citrate-vitamin D3)</td>
<td>315-250 mg/unit</td>
<td>Oral daily</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Fish Oil (Omega 3)</td>
<td>1000 mg PO</td>
<td>BID</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Carboxymethylcellulose sodium 1% Drops OU</td>
<td>PRN dryness</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Albuterol Inhaler</td>
<td>1 PUFF IH Q6H:PRN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Calcitriol</td>
<td>0.25 mcg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Citalopram</td>
<td>40 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Clopidogrel</td>
<td>75 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Cyanocobalamin</td>
<td>1000 mcg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>cycloSPORINE</td>
<td>0.05 % OU TID</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Docusate Sodium</td>
<td>100 mg PO</td>
<td>BID</td>
<td></td>
</tr>
<tr>
<td>11.</td>
<td>FolIC Acid</td>
<td>1 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>12.</td>
<td>Glucagon</td>
<td>1 mg IM PRN</td>
<td>low blood sugar</td>
<td></td>
</tr>
<tr>
<td>13.</td>
<td>Levothyroxine Sodium</td>
<td>88 mcg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>14.</td>
<td>Lisinopril</td>
<td>20 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>15.</td>
<td>Metoclopramide</td>
<td>10 mg PO</td>
<td>QIDACHS</td>
<td></td>
</tr>
<tr>
<td>16.</td>
<td>Omeprazole</td>
<td>20 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>17.</td>
<td>Senna 2 TAB</td>
<td>PO DAILY:PRN</td>
<td>constipation</td>
<td></td>
</tr>
<tr>
<td>18.</td>
<td>Tiotropium Bromide</td>
<td>1 CAP IH</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>19.</td>
<td>Amlodipine</td>
<td>10 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>20.</td>
<td>Labetalol</td>
<td>600 mg PO</td>
<td>TID</td>
<td></td>
</tr>
<tr>
<td>21.</td>
<td>Glargine</td>
<td>18 Units Bedtime</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Insulin SC Sliding Scale</td>
<td>using HUM Insulin</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22.</td>
<td>Lidocaine 5% Patch</td>
<td>2 PATCH TD</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>23.</td>
<td>Methadone</td>
<td>12.5 mg PO</td>
<td>DAILY</td>
<td></td>
</tr>
<tr>
<td>24.</td>
<td>Multivitamins</td>
<td>1 TAB PO</td>
<td>QAM</td>
<td></td>
</tr>
<tr>
<td>25.</td>
<td>Acetaminophen</td>
<td>650 mg PO</td>
<td>Q6H</td>
<td></td>
</tr>
</tbody>
</table>
What happened to our patient after discharge from the SNF?

- Discharged on a Saturday
- Given new script for Methadone
- Pharmacy did not have the medication
- Began taking opiates that she had at home (oxycodone, morphine)
- Developed urinary retention, subsequent AKI, and altered mental status
Frequency and Predictors of Prescription-Related Issues after Hospital Discharge

Sunil Kripalani, MD, MSc
Megan Price, MS
Victoria Vigil, MS, CPA

BACKGROUND: In the period immediately following hospital discharge, patients often experience difficulty with medication management. The problems related to patients' handling of discharge prescriptions are not well characterized.

CONCLUSIONS: About 7% of patients reported prescription-related issues within a few days of hospital discharge. High-risk patients should be identified and offered additional assistance prior to discharge and receive a follow-up phone call to assess if discharge prescriptions have been filled. *Journal of Hospital Medicine* 2008;3:12–19. © 2008 Society of Hospital Medicine.

* Division of General Medicine, Department of Internal Medicine, University of Colorado School of Medicine, Denver, Colorado
Discharge Medications:
1. Glargine 20 units qHS
2. Novolog 12 units qAM, 32 units at lunch/dinner
3. Novolog sliding scale
4. Amlodipine 5 mg BID
5. Methadone 5 mg BID
6. Lansoprazole 15 mg BID
7. Odanacatib 1 mg BID
8. Acetaminophen 650 mg TID
9. Ciprofloxacin 250 mg BID x 1-5 days
10. Pantoprazole 40 mg daily
11. Levothyroxine 88 mcg daily
12. Metoclopramide 10 mg qACHS
13. Citalopram 40 mg daily
14. Calcitriol 0.25 mcg daily
15. Clopidogrel 75 mg daily
16. Cynacobalamin 1000 mcg daily
17. Folic acid 1 mg daily
18. Metoclopramide 10 mg qACHS
19. Ciprofloxacin 250 mg BID x 1-5 days
20. Omeprazole 20 mg daily
21. Pantoprazole 40 mg daily
22. Tiotropium MDI daily
23. Levothyroxine 88 mcg daily
24. Metoclopramide 10 mg qACHS
25. Ciprofloxacin 250 mg BID x 1-5 days
26. Omeprazole 20 mg daily
27. Pantoprazole 40 mg daily

- 5 new medications started
- 2 prior medications discontinued
- Duplication of two PPIs
- 2 dosing changes
- 1 old medication omitted

Discharge Medications:
1. Calcitriol 0.25 mcg PO daily
2. Citalopram 40 mg PO daily
3. Clopidogrel 75 mg PO daily
4. Cyanocobalamin 1000 mcg PO daily
5. cycloSPORINE 0.05 % OUt
6. Docusate Sodium 100 mg PO daily
7. Fish Oil (Omega 3) 1000 mg PO daily
8. Gabapentin 400 mg PO daily
9. Glucagon 1 mg IM PRN
10. Levothyroxine Sodium
11. Lorazepam 1 mg PO Q6H
12. Metoclopramide 10 mg PO DM
13. Morphone SR (MS Contin)
14. Tiotropium Bromide 18 mcg
15. Multivitamins 1 TAB P.O.
16. Omeprazole 20 mg PO daily
17. Senna 2 TAB PO DAILY
18. Metoclopramide 10 mg PO daily
19. Lisinopril 20 mg PO daily
20. Insulin Pump SC (Sel Aspart (Novolog) (non-for

- 4 new medications started
- 5 prior medications discontinued
- 1 old medication omitted

Medications on Admission:
1. Calcitriol 0.25 mcg PO daily
2. Citalopram 40 mg PO daily
3. Clopidogrel 75 mg PO daily
4. Cyanocobalamin 1000 mcg PO daily
5. cycloSPORINE 0.05 % OUt
6. Docusate Sodium 100 mg PO daily
7. Fish Oil (Omega 3) 1000 mg PO daily
8. Gabapentin 400 mg PO daily
9. Glucagon 1 mg IM PRN
10. Levothyroxine Sodium
11. Lorazepam 1 mg PO Q6H
12. Metoclopramide 10 mg PO DM
13. Morphone SR (MS Contin)
14. Tiotropium Bromide 18 mcg
15. Multivitamins 1 TAB P.O.
16. Omeprazole 20 mg PO daily
17. Senna 2 TAB PO DAILY
18. Metoclopramide 10 mg PO daily
19. Lisinopril 20 mg PO daily
20. Insulin Pump SC (Sel Aspart (Novolog) (non-for
Number of meds per patient increased with each transition: (6.5 -> 10.7 -> 12.6)

Average of 7.5 medication changes per patient per transition
Medication discrepancies across multiple care transitions: A retrospective longitudinal cohort study in Italy

Marco Bonaudo¹*, Maria Martorana¹, Valerio Dimonte¹, Alessandra D’Alfonso², Giulio Fornero³, Gianfranco Politano⁴, Maria Michela Gianino¹

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Results

Of 366 included patients, 25.68% had at least one discrepancy. The most frequent type of discrepancy was from medication omission (N = 74; 71.15%). Only discharge from a long-stay care setting (T4) was significantly associated with the onset of discrepancies (p = 0.045). When considering a lack of adequate documentation, not as missing data but as a discrepancy, 43.72% of patients had at least one discrepancy.
Risks of Transitions

- Adverse drug events
- Missed results from pending tests
- Lack of appropriate follow-up
Patient Safety Concerns Arising from Test Results That Return after Hospital Discharge

Christopher L. Roy, MD; Eric G. Poon, MD, MPH; Andrew S. Karson, MD, MPH; Zahra Ladak-Merchant, BDS, MPH; Robin E. Johnson, BA; Saverio M. Maviglia, MD, MSc; and Tejal K. Gandhi, MD, MPH

Background: Failure to relay information about pending test results when patients are discharged from the hospital is an important patient-safety problem. Few data are available on the epidemiology of test results pending at discharge, and physician awareness of these results.

Objective: To determine the prevalence, characteristics, and physician awareness of potentially actionable laboratory and radiologic test results returning after hospital discharge.

Design: Cross-sectional study.

Setting: Two tertiary care academic hospitals.

Patients: 2644 consecutive patients discharged from hospitalist services from February to June 2004.

Measurements: The main outcomes were the prevalence and characteristics of potentially actionable test results returning after hospital discharge, awareness of these results by inpatient and primary care physicians, and satisfaction of inpatient physicians with current systems for follow-up on test results. The authors prospectively collected data on test results pending at the time of discharge and, as results returned after discharge, surveyed hospitalists, junior residents, and primary care physicians about those results that were potentially actionable according to a physician-reviewer.

Results: A total of 1095 patients (41%) had 2033 test results return after discharge. Of these results, 191 (9.4% [95% CI, 8.0% to 11.0%]) were potentially actionable. Surveys were sent regarding results in the surveys with responses, physicians had been unaware of 65 (61.6% [CI, 51.3% to 70.9%]); of these 65, they agreed with physician-reviewers that 24 (37.1% [CI, 25.7% to 50.2%]) were actionable and 8 (12.6% [CI, 6.4% to 23.3%]) required urgent action. Inpatient physicians were dissatisfied with their systems for following up on test results returning after discharge.

Limitations: The authors were unable to determine whether physicians' lack of awareness of test results returning after discharge was associated with adverse outcomes.

Conclusions: Many patients are discharged from hospitals with test results still pending, and physicians are often unaware of potentially actionable test results returning after discharge. Further work is needed to design better follow-up systems for test results returning after hospital discharge.
Pending Laboratory Tests and the Hospital Discharge Summary in Patients Discharged To Sub-Acute Care

Stacy E. Walz, MS¹, Maureen Smith, MD, MPH, PhD¹,²,³, Elizabeth Cox, MD, PhD⁴, Justin Sattin, MD⁵, and Amy J. H. Kind, MD¹,⁶,⁷

J Gen Intern Med 26(4):393–8

Only 11% of these tests were documented in the discharge paperwork
Risks of Transitions

• Adverse drug events

• Missed results from pending tests

• Lack of appropriate follow-up
Greater than 1 in 4 of discharged patients had recommendations for an outpatient work-ups

36% of these work-ups were not completed
- DC summaries with documentation of recommended work-up increased likelihood of work-up being completed
- Increased time to initial post dc visit with PCP decreased likelihood of work-up being completed

Results: Of 693 hospital discharges, 191 discharged patients (27.6%) had 240 outpatient workups recommended by their hospital physicians. The types of work-ups were diagnostic procedures (47.9%), subspecialty referrals (35.4%), and laboratory tests (16.7%). The most
Back to our patient: what is her understanding & perspective?
Discharge instructions from the ICU:

You were admitted on 10/30 for altered mental status, high blood sugars, and high blood pressures. Your confusion and high blood pressures required a stay in the ICU. You were put on several medications to manage your blood pressure and at discharge it is moderately well controlled. You should follow up with your primary care provider for further monitoring and treatment.

You came to the hospital with high blood sugars. You were taken off your insulin pump and were put on long acting and short acting insulin. Please continue this insulin regimen until you see your endocrinologist.

In addition, you were on many pain medications at home, which likely contributed to your confusion. You have been taken off your home medications and put on a long-acting opioid medication, methadone, with plans to slowly titrate it down. At discharge please see your primary care physician for further management of your pain.
“I felt the doctors and the nurses did a good job taking care of me. I didn’t know I had problems with my blood pressure. I remember I had a problem with my kidneys, but I don’t know what caused it. At the rehab, I had some physical therapy. I don’t think I had any problems while I was there. I didn’t know I had a urine infection or problems with my kidneys again.”
“I couldn’t get methadone when I went home. I had so much pain so I took oxycodone and morphine that I had at home. I didn’t know what else to do. I didn’t know the morphine was causing the problems with my kidneys. But I know now not to take this anymore.”

“I feel I have a good system with my medications. I divide my morning medications, evening medications, and once-a-day medications in different plastic bags. I put away old medications in the back of the bathroom shelf.”
Patients' Understanding of Their Treatment Plans and Diagnosis at Discharge


RESULTS

Of the 47 patients surveyed, 4 were excluded. Of the remaining 43 patients, 12 (27.9%) were able to list all their medications, 16 (37.2%) were able to recount the purpose of all their medications, 6 (14.0%) were able to state the common side effect(s) of all their medications, and 18 (41.9%) were able to state their diagnosis or diagnoses. The mean number of medications prescribed at discharge was 3.89.

CONCLUSIONS

Less than half of our study patients were able to list their diagnoses, the name(s) of their medication(s), their purpose, or the major side effect(s). Lacking awareness of these factors affects a patient’s ability to comply fully with discharge treatment plans. Whether lack of communication between physician and patient is actually the cause of patient unawareness of discharge instructions or if this even affects patient outcome requires further study.
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.
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