The Meds are a Mess: Post-hospital Medication Errors in the Elderly

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As I see it:
History of Transitions of Care

- TOC was a backwater topic
  - Process of care quality measures are dull compared to big diseases like heart disease, cancer, Alzheimer's
  - Lacks big funding,
- including industry/pharmaceutical
- Some play at meetings such as AGS
Then the big time...

Affordable Care Act, Section 3025, required CMS to establish penalties for excessive readmissions, The Hospital Readmissions Reduction Program (HRRP)
- Rate is 3 yrs of 30 day readmission data by disease at index admission
- 3 yr rate is more stable, but full impact of any intervention takes 3 yrs
  - 2013: AMI, HF, pneumonia
  - Have since added COPD and TKA/TKA; CABG next year; ?? all cause coming
  - Adjusted for age, comorbidities, but not SES
  - Fee For Service Medicare only, excludes Advantage
  - Initially fee cap was 1% of all of a hospital's Medicare revenue, now 3%
  - Penalty only, for each dx adjusted readmission rate above the national mean
- additive for each dx but no reward (subtraction) for any dx below mean

...and even bigger time
HRRP Penalties

- FY 2016: 78% of hospitals have some penalty (because at least one of the dx is above the national mean—as more Dx are included, likelihood of penalty increases)
  - Of these, 80% have less than 1% penalty
  - Medicare will collect $420 million FY 2016 in penalties
  - Additional $ Billions saved by readmissions averted

- UCH
  - No penalty for 2013 and 2014
  - 2015 and 2016, 0.87% and 0.73%

- 2016 scores, 1.0 = national mean; above 1 is penalty; below 1 is better but no reward
- Favorable: CHF 0.92, COPD 0.97
- Unfavorable: AMI 1.02, Pneumonia 1.03, THA/TKA 1.39*
  - Teaching hospitals, urban hospitals do worse (no adjustment for SES)

*above 95% CI, and therefore reported on CMS's public Hospital Compare site

Is the HRRP working?

[Graph showing national Medicare readmission rates started to fall in 2012]
Are excess readmits unique to US FFS?

- International:
  - **Canada 2012**
    - all ages 8.5%
    - copd 18.1, chf 21, pna 12.5.
  - **England 2011**
    - over 75 yrs old, 16% in 2011 (28 day readmissions)
- US integrated, managed systems
  - VA, *risk-adjusted readmission rate compared to non-VA US hospitals, 2010-13*:
    - MI: 17.8 vs 17.2
    - CHF: 24.7 vs 23.5
    - PNA: 19.4 vs 18.7
  - VA has slightly (but significantly) higher readmission rates
    - *Kaiser circa 2008, 17% over age 64, comparable is about 20% for Medicare*
  - *Sudhaker et al. Association of Admission to Veterans Affairs Hospitals...JAMA 2016*

The topic, Readmissions, is too big....

Search results

Items: 1 to 20 of 15142

1. From discharge to readmission: Understanding perspective.
   - Howard Anderson, J. Buonitelli & L. Lenzi
   - 2016
... with many good programs out there...

- Care Transition Program, Coleman
- Project RED, intensive inpatient and at DC, one phone call afterwards
- Bridge, key person is MSW
- Mary Naylor (many yrs doing this),
  - *NP home visit*
- Many more, including local interventions not in the literature

...so focus here is on the medications.
Case

- 73 year old female hospitalized at UCH with urosepsis (positive blood culture). PMH HTN, DM2, AS
- DC with Levaquin (based on culture); DC note indicates "patient reported past intolerance of Levaquin"
- On follow up phone call 3 days after discharge by Seniors Clinic clinical pharmacists, pt reported nightmares, hallucinations, other symptoms, and asked about going to ER. Also noted in chart increased QT since starting Levaquin
  - Symptoms similar to past use of Levaquin
  - Changed to Augmentin with full recovery without ED
  - Likely pt would have been admitted if she had gone to ED with hallucinations and recent DC for sepsis without the pharmacists call

How bad is it?

Are medication errors at transition truly highly prevalent or do spectacular medication disaster cases stick in our minds?

![Figure 3. Order Written for 8 Units of Lantus Insulin Misread as 80 Units](image)
Prevalence of med errors after DC

- Med errors after Vanderbilt cardiac medical discharges
- *n*=471, mean age 59, mean meds 12 (inc OTCs)
- compared post discharge pt reported meds (by phone) to DC med list
- 51% had at least one discordant med, slightly more taking med not on DC list, slightly less not taking a med on the DC list
- 59% reported confusion in dose/frequency of a cardiac med
- Low health literacy and low numeracy (ability to work with numbers) associated with errors


Are meds associated with readmissions?

- Number of DC meds predicts readmissions
  - *N*=5507 discharges, 1147 (20.8%) 30-day readmissions, St Louis, 2013, mean age 56
  - *Mean 7.2 DC meds if readmitted, 6.0 if not readmitted, p<.001*
  - *In logistic regression, 7 or more meds OR 1.26 (1.17, 1.6)*

*Picker et al. The number of Discharge Medications...BMC Health Services Research 2015*
Association of meds and readmissions

- Experience with an Advice Line (Denver Health)
  - 308 calls from pts DC within previous 30 days (2011-12) compared to 18,995 who did not call
  - Symptoms most common reasons for call, followed by med probs (21%),
  - probs with understanding instructions (med admits) vs pain control (surg admits)
  - Readmission rate 15% if call, 4% if not, p<.0001
  - Med problems lead to calls, calls associated with readmission

Stella et all. Post discharge problems identified by Telephone calls...Journal of Hospital Medicine 2014.

Medication complexity and readmissions

- High Risk Medication Regimen score predicts readmissions
  - N=911 discharges using Home Health OASIS dataset
  - In ROC analysis, this score more predictive of readmissions than co-morbidities
- measurement is a composite score of 3 components:
  - Polypharmacy
  - Strongest predictor of 3 components
  - Tyl and pmn's count; vitamins and supplements don't
  - 9 or more meds is cutpoint most predictive of readmission
  - Potentially inappropriate meds (2003 Beers),
  - weakest predictor of the three components, confirmed in other studies
  - Recent Beers be more predictive?
  - Complexity of doses (frequency, with/without food, crush, etc) and forms of meds (oral, topical, injection, inhaled, etc)
  - Polypharmacy, PIMs, Complexity alone are weak predictors at best in other studies
  - but in composite are highly predictive

The patient perspective

- Structured interview with 100 pts (convenience sample) who had 60 day readmission (Houston), mean age 55*
  - 64% reported a drug related problem contributing to readmission
  - Missed follow up appointment increases risk (OR 5.63, 1.52 to 20.86)
  - Pharmacist involved at DC or outpt protective (OR 0.38, 0.15 to 0.99)

- Survey of 1084 pts with 30 day readmissions, 2010, urban Pennsylvania.**
  - 32% response rate, mean age 56
  - 20% reported unable to take medications as prescribed
- Side effects, cost, transportation to pharmacy
- Risk higher if lower SES

*Thomas et al. Descriptive Analysis of patient readmissions within 60 days due to Medication related Events. Hops Pharm 2015

Interventions for better medication outcomes

- Nurses, home health or clinic-based
- Telemedicine
- Clinician home visits (the gold standard)
- Pharmacists
  - Most appropriate expertise for complex medication regimens in at-risk elderly patients
  - “Clinical pharmacists are most underutilized resource in health care” B Parnes 3-3-16
  - History of excellent clinical pharmacists at Seniors, and they are a key piece of Senior Clinic intervention
  - However, limited evidence in the literature
Pharmacist interventions before discharge

- Multiple studies of Interventions done by inpt pharmacists ("transition-of-care pharmacist") which sometimes also includes a post discharge component
  - *intensive counseling and med recon at DC; phone calls on post hosp days 3, 14, 30*
  - N=137, mean age 55, Chicago 2013
  - Phone calls included med review, new concerns, ADES, etc.
  - Fewer readmissions (20.4% vs 23.9%–ns)
  - *Intensive involvement at DC inc. addressing insurance issues with outpt pharmacy*
    - California 2013, n=40, STEMI with stents vs historical control
    - Call 2-3 days post discharge, open ended call
    - Readmission 5% compared to 13% control, (ns)


Pharmacist interventions post discharge:
home visits by pharmacists

- Post CHF inpt, collaboration of Home Health and community pharmacy resident*
  - *One standardized home visit, two follow up calls, n=10 (!)*
  - *Better med adherence, but 3 readmits (one for CHF), 1 death*
- Pharmacist home visit after medical admission**
  - n=30 (6 month period), Rhode Island, 75% over age 65
  - *2 hour visit (!) full medication review inc costs of meds, therapy duplication, interactions, underuse, incorrect meds, clarifying instructions*
  - 67% had medication problems
  - *Most pts refused this free service when recruiting for the study*

*J Am Pharm Assn, Post Discharge Community Pharmacist, Kallsta et al, 2015
Community pharmacist MTM home visit

- 7 Kroger pharmacists trained in post discharge MTM, Cincinnati area
- Pharmacist home visit, then communication as indicated with PCP. Added on to already existing Care Transition program (Coleman) for selected high risk patients
- N=30 (60 control), mean age 66
- Mean of 7 interventions recommended per pt, inc self management, added therapy, vaccinations, med reconciliation
  - *After consultation with PCP, 18 new therapies, 10 therapies DC'd, 8 dose changes, 9 med changes*
- Readmission 7% vs 20%, OR 0.072 (0.008,0.628), p=.017

Luder et al. TransitionRx: impact of community pharmacy

Enhanced role, pharmacist home visit

- Clinical pharmacist trained in care mgmt, "Pharmacist Care Manager"
- 2-3 home visit post discharge, telephone follow up
- "MTM on steroids" including:
  - *Fall risk, home safety, mental health, cog assessment, caregiver needs, nutrition*
  - *"Red flag" pt training*
- Extensive training of clinical pharmacists required for this role
- Medicare Advantage (Dovetail Health, Neeham MA), costs paid out of readmissions averted
- "Dramatic reduction in 30-day readmissions" but data not published (no response from authors)

Novak et al. Reducing unnecessary hospital readmission...The consultant pharmacist. 2012
Pharmacist telephone intervention post discharge

- VA, part of the Pharmacological Intervention in Late Life (PILL) Service, 2010-2
  - All patients with cog impairment (higher risk),
  - Geriatric clinical pharmacist call to pt or care-provider 2-5 days post DC, full medication review
  - DC from hospital with mean 14.8 meds, 2.8 changes from outpt list
  - 132 Pts not reached/ 112 reached but declined (comparison); 257 fully participated
  - Readmission rate 25% intervention, 37/34% comparison groups (p=.01/.07)
  - Cost benefit analysis:
    - Cost per pt $613 (why so costly?)
    - Saved $540-800 per pt in readmission cost.
    - Each 5 min of added time of phone call reduced 60-day readmission likelihood by 15%

Paquin et al. Pharmacists Calls to Older Adults with Cognitive Difficulties after Discharge...JAGS 2015

AHP/Seniors Clinic combined project

- Ambulatory Heath Promotions (AHP) identifies the UCH discharges of Seniors Clinic patients to community in real time, calls pt, sets up f/u visit in ≤14 days, and communicates with and handoff to clinical pharmacy and nursing
  - Time, ~15 minutes/pt including documentation
  - Special appointment slots to assure access
- Nurses follow high risk (using LACE+ score) with regular phone contact
  - "Dance into it and try to make it meaningful"
- Clinical pharmacist phone MTM
  - handoff from inpt pharmacist on ACES patients
- Provider visit within 14 days (7 days if high risk)
- Expanding to SNFs at transition to community
The clinical pharmacist phone call

- Phone call content:
  - Each medication patient is taking is reviewed, including OTCs and herbals
  - Discrepancies with DC list identified.
  - Discrepancies between DC Note and DC med list (often requires contacting inpt team)
  - DC med list is not always gold standard if not in patients best interests/appropriate therapy. Communication with DC team as appropriate
  - Drug-drug, drug-disease, interactions identified
  - Actively address potential medication-induced conditions, such as constipation with opiates
- Recommendations made to providers
  - Can be by EMR or face to face as appropriate (potential advantage of clinic based pharmacists over central)
  - In addition to med recommendations, can include lab, immunizations
- Average one hour per discharge including documentation

Readmission Outcomes

- August 2014-December 2015, n=402 Seniors Clinic pts discharged from UCH to community (non-SNF) who received the AHP/Seniors Clinic intervention
  - Now about 500 have been completed
- 57 readmissions, 14.2%
  - Most recent quarter 13.3%, declining rate may be due to greater experience with intervention and ongoing improvements
- UCH readmission rate 15.6%
- LACE+ score (readmission risk) 64.4 Seniors, 56.4 UCH which correlates with a 1.3x higher risk of readmission for Seniors Clinic discharges
**Medication Outcomes**

In 1.5 years, ~500 cases, only one case with med list exactly correct and no recommendations.

About 30% of cases have ≥ 1 major discrepancy or recommendation, "near miss"

Key categories:
- Antibiotic-related
- Constipation-related
- Added medications
- Drug interactions
- Anticoagulation
- Renal dose change

**Potential advantage of phone over face to face medication reconciliation in office**

- In office visit, patient may forget to bring some or all meds
- Meds brought in to office visit may not be what is actually being taken
- Difficulty of coming in to clinic within 1-2 days of discharge
- Intangibles of phone conversation
Case study, advantage of phone over F2F

- 88 yr old frail female DC'd from UCH after elective admission for NPH shunt placement
  - Apparent low risk DC, elective procedure, anticipated no differences in chronic meds
  - Pt has cognitive and balance issues, common with NPH

- Clinical Pharmacist call to pt (husband joined in call):
  - Pt had anxiety leading up to procedure, discharged home with new med lorazepam, husband reported that pt was out, "used like candy"
  - Pt prescribed oxycodone for pain, requesting more, bowel issues reported
  - Husband reported he just became aware that pt taking OTC doxylamine (Unisom, antihistamine, Beers List) regularly for "long time", not previously reported to PCP

- Above issues addressed in collaboration with PCP and pharmacist at time of call and on subsequent clinic visits
- Above issues less likely to have been identified in face-to-face clinic visit

Another UCH TOC program: AFWilliams

- RN combines AHP (phone contact with pt/appt) and clinical pharmacy of Senior Clinic
- Excellent outcomes, reduced readmissions to 13%
- RN referral to clinical pharmacy in 12.5% of cases if:
  - Any of these DC dx: pna, DM foot, ACS, new/uncontrolled DM, COPD, CHF
  - Pts with specific med questions
  - On specific meds inc insulin, anticoag
  - Misc other reasons

- For Seniors Clinic, this would be 90+% of discharges
- Both AHP/Seniors and AFW are successful programs:
  - Each fit their population
  - Each utilize existing and available resources (assumes no new funding at outset)
Questions?

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