Risk Factors and Avoidability of Readmission Within 7 Days After Hospitalization for Heart Failure: A Mixed Methods Health Record Audit

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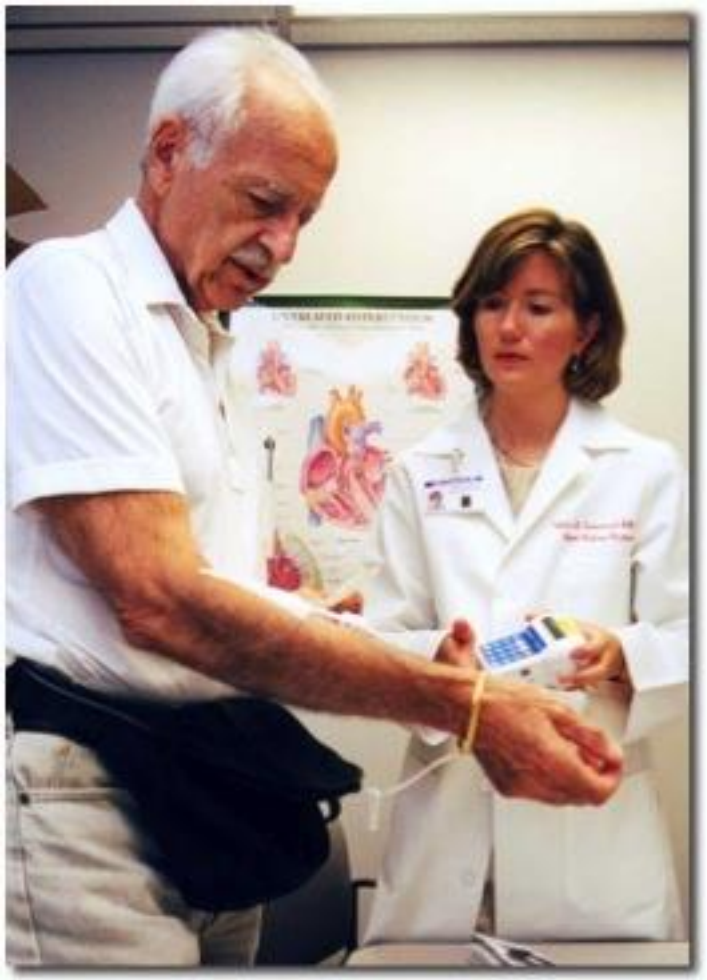
Heart Failure and Readmission



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Clinical Research

Determinants of Early Readmission After Hospitalization for Heart Failure

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- Phase One: 18,590 patients discharged with heart failure (HF) 2004-2012
  - 18% readmitted within 30 days = 3340 patients
  - 6% readmitted within 7 days = 1033 patients

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Phase 1: Factors Predicting Readmission within 7 days

More likely to be readmitted

- Age >75 years
- Renal disease
- Discharged home with homecare services
- Left against medical advice

Less likely to be readmitted

- Discharged from hospitals with HF specialty services

- **Readmission within 7 days after discharge**
  - Most ‘avoidable’
  - Most closely related to inpatient care

Avoidability

- There is a way around the event happening; preventable

- Literature gaps:
  - Subjective criteria
  - Health record reviews
  - Multiple physician panels
  - Med-surg populations only

Phase 2: Purpose

- To describe risk factors for readmission within 7 days of discharge
- To determine the potential avoidability of these early readmissions
- Why?
  - To clarify gaps in the quality of inpatient care
  - To identify strategies for intervention

Mixed Method Health Record Audit

Quantitative

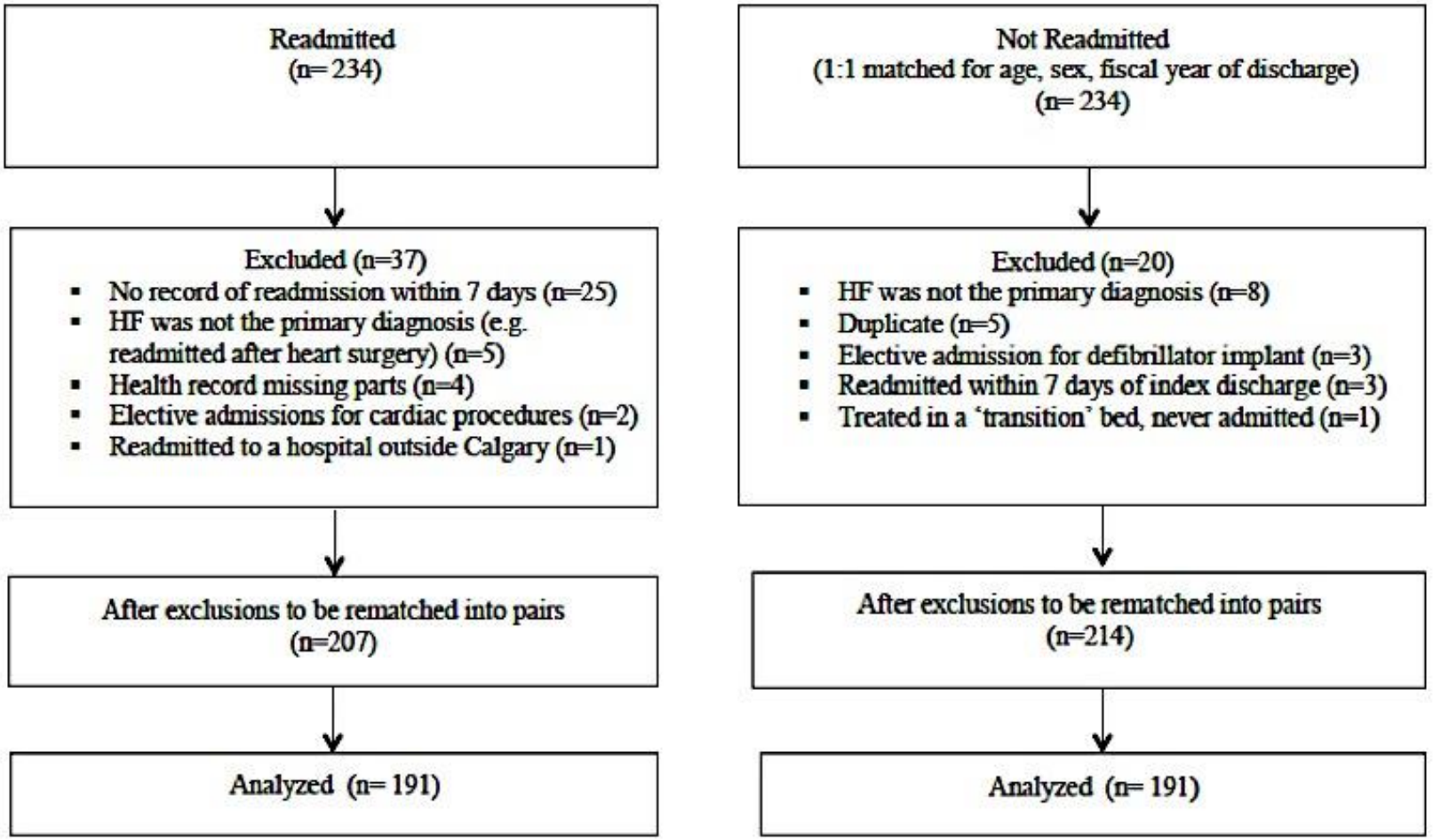
- 55 variables
- Logistic regression - to identify risk factors for readmission

Qualitative

- Content analysis - to describe factors/events that precipitated readmission
- Scored avoidability

Sample

Figure 2 Adults discharged from Calgary, AB hospitals between April 1, 2004 and March 31, 2012 with heart failure that were readmitted and not readmitted within 7 days of discharge



Results

191 matched pairs (n=382); 50% female; mean age 78

- Of readmitted patients:
- 42% **Frail** (28% controls)
  - >75 years, >3 comorbid conditions, assistance with activities of daily living)
- 80% on ace-inhibitors (76% controls)
- 55% had patient education documented (54% controls)
- 50% were referred to HF clinics (40% controls)
- 31 (16%) had end-of-life discussions documented (8% controls)
  - 28 patients died during readmission
- 3% of both groups received palliative care services

Conditional Multivariate Regression

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI	OR 95% CI
Frailty	2.30 [1.41, 3.76]	2.20 [1.35, 3.67]	2.00 [1.18, 3.32]	2.00 [1.21, 3.46]	2.00 [1.20, 3.46]
Provider type (specialist)	2.10 [1.32, 3.42]	2.20 [1.37, 3.63]	2.20 [1.36, 3.62]	2.00 [1.22, 3.36]	2.10 [1.26, 3.54]
Note to see physician within 1 week of discharge		0.56 [0.36, 0.88]	0.55 [0.35, 0.87]	0.53 [0.33, 0.85]	0.53 [0.33, 0.86]
End-of-life discussion documented			2.10 [0.97, 4.71]	2.10 [0.93, 4.53]	2.20 [0.97, 4.81]
Referral to heart function clinic or cardiologist after index discharge				1.40 [0.91, 2.28]	1.40 [0.88, 2.23]
No weight loss during index admission					1.20 [0.99, 1.44]

Qualitative:
Conventional Content Analysis

Grouping factors or events and counting

Presenting Problem

Cardiac = 54%

Non-cardiac= 46%

Presenting Problem	Frequency (%)

Cardiac
- Heart failure
- Other cardiac
  - Dysrhythmia
  - Acute coronary syndrome
  - Other
	103 (54%)
	79 (41%)
	24 (13%)
	13
	9
	2

Gastrointestinal - Infection - Non-specific GI (e.g. pain) - GI bleed - GI ischemia	25 (13%) 11 6 5 3
Respiratory - Infection - COPD - Pulmonary embolism	19 (10%) 14 3 2

Presenting Problem

Infections = 16%

Presenting Problem	Frequency (%)
Urinary/ Renal	9 (5%)
- Urinary tract infection	14
- Renal failure	3
- 0ther	2
Other	35 (18%)
- Dementia/ delirium	6/1
- Falls / musculoskeletal	2/4
- Hypovolemia	5
- Hyperkalemia	3
- Other infection (IV)	3
- Cancer	2
- Stroke	2
- Drug reaction	2
- Bleed/ clot	1/1
- Liver	1

Factors Contributing to Readmission: Content Analysis (n=191)

- Continuing symptoms 80 (42%)
- New health issue 35 (18%)
- Medication-related 20 (10%)
- Self-care issue 16 (8%)
- Failure to thrive 11 (6%)
- Refusal of care 10 (5%)
- Potentially inappropriate placement 9 (5%)
- Hospital-related 5 (3%)
- Palliative 4 (2%)
- Healthcare provider error (<1%)

Avoidability

Implicit Criteria

1. Virtually no evidence of avoidability
2. Slight to modest evidence of avoidability
3. Avoidability not likely (less than 50/50)
4. Avoidability likely (more than 50/50)
5. Strong evidence of avoidability
6. Virtually certain evidence of avoidability

Explicit Criteria

- **Low Avoidability**
  - New unforeseen problem
  - Continuing symptoms but stable at discharge
  - Refusal of care
  - Services provided but not enough
- **High Avoidability**
  - Signs and symptoms present at discharge
  - Adverse event related to clinical care
  - Social or self-care issue not addressed with added services
  - High disability but no added services
  - Discussion of palliation but no added services

Avoidability Scores Using Implicit and Explicit Criteria

Avoidability	Implicit	Explicit
1. Virtually no evidence of avoidability	33 (17.3%)	7 (0.4%)
2. Slight to modest evidence of avoidability	71 (37.2%)	25 (13%)
3. Avoidability not likely (<50/50)	39 (20.4%)	52 (27.2%)
4. Avoidability likely (>50/50)	33 (17.3%)	29 (15.2%)
5. Strong evidence of avoidability	15 (7.9%)	78 (40.8%)
6. Virtually certain evidence of avoidability	0	0
Potentially avoidable readmissions	25%	56%

Future Research

- Validate new instruments for
  - Screening for frailty
  - Assessing for discharge readiness
  - Judging avoidability using explicit criteria
- Test interventions and outcomes for reducing 7- and 30- days readmissions
  - Assessment and treatment of frailty
  - Assessment of discharge readiness
  - Hard-wiring early medical follow-up
  - Earlier involvement of palliative and hospice services

Conclusions

- Readmission within 7 days occurs in 6% of HF discharges (1033 patients/year in AB)
  - Costly and potentially avoidable.
  - Increased risk of readmission was associated with
    - Frailty
    - Specialist as attending physician
  - Simple strategies can reduce the risk of readmission
  - Instructions to follow-up with a physician within 1 week
- Approximately 56% of these readmissions were avoidable

  - Questions?