Falls Among Inpatients in Short-Term, Acute Care Environments

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Texas Health Harris Methodist Hospital Fort Worth (THFW)

- Located in North Texas region
  - Dallas-Fort Worth (DFW) metroplex
- Texas Health Resources (THR) one of the largest faith-based, non-profit health care systems in the United States
  - The system is comprised of 24 acute-care and short stay hospitals and a long term continued care facility
- THFW has more than 1,400 physicians and 400 allied health professionals on the medical staff, over 4,500 employees and more than 450 volunteers
- Currently licensed for 720 beds
  - Joint Commission Accredited
- Magnet® Designated Facility with approximately 1,800 RNs

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Services Provided

Bariatric Services
Brain Tumor Program
Cardiovascular
Clinical Aromatherapy
Community Education
Emergency Medicine
Gastroenterology
General Medicine
Hyperbaric Oxygen Therapy
Interventional Radiology
Neonatal (Level III)
Neurological/Neurosurgical
Occupational Health and Travel (one offsite clinic)
Oncology (including inpatient and outpatient chemotherapy site)
Orthopedic
Palliative Care (adult and perinatal)
Perinatalogy
Pulmonary
Renal
Renal Transplantation
Comprehensive Stroke Care
Surgery
Telemedicine
Trauma (Level II Trauma Center)
Women's Health
Wound and Ostomy Care

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Background

- What is a Fall?
  - "inadvertently coming to rest on the ground, floor, or other lower level, excluding intentional change in position."

- 2-12% of all patients experience at least one fall during the course of a hospital stay based on national research

- Rate of falls fluctuates between two and 17 falls per 1,000 patient days in hospitals in the US

- Consequences of falls
  - Patient
  - Patient's families
  - Healthcare providers
  - Healthcare System

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Review of Literature

- Fall Risk Factors
  - History of previous falls
  - Increased age
  - Altered level of consciousness
  - Depression
  - Altered elimination
  - Dizziness
  - Medication
  - Male gender
  - Mobility
  - Assistive devices
  - Sensory impairment
  - Primary and secondary diagnoses

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Purpose

- Determine the factors most strongly associated with falls among hospital inpatients and to determine if the factors associated with falls in the THFW facility are consistent with factors associated with falls in other facilities reported in the literature.

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Design and Method

- Mixed Methods Study
  - Content analysis of narrative incident reports
    - 105 inpatient falls over 6 month period
  - Case control component
    - Sample size 1,326 patients over 1 year period
    - Fallers and Non-Fallers

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Results from Content Analysis

- Toileting
  - Attempting to get up to toilet without assistance
  - Being assisted to the bathroom or BSC and left unattended
  - Urinal use
- NO ALARM initiated
  - Bed
  - Chair
- Equipment
  - Ill fitting non-slip socks
  - Shower chairs
  - BSC
  - Chairs at night
  - Tubing/cords
  - Blankets
- Interruptions

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Results – cont.

- Medication association
  - Staff recognition of impacting medications
  - SNAP meds
- Impulsive patients
- Knees "buckling" even when assisted by staff
- Reaching for items
  - On floor
  - On bedside table
- Staff disconnect between "high risk" and interventions
  - Patients in all risk categories experience falls
- Lack of post fall documentation
- Staffing

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Results from Content Analysis

- Most fallers were between 40-80 (mean = 63)
- 86% of fallers did not get assistance to the bathroom
- 47% of falls occurred during the process of toileting or bathing
  - 26% of those happened when the patient was left alone
- 17% of fallers received a benzodiazepine (benzo) within 12 hrs of falling
  - Receiving a benzo in the 12 hrs prior to fall did not increase the likelihood of staff assistance
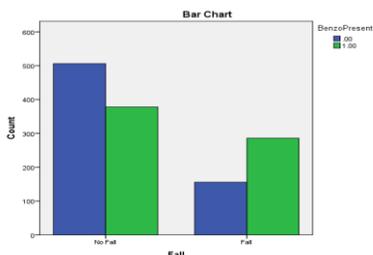- 67% of fallers were wearing non-slip footware

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Results – Univariate Benzodiazepines

- Receiving benzodiazepines was significantly associated with falling in the hospital

  $(X^2 = 56.77, p = 0.0001)$
- Risk of falling for patients exposed to benzos was 1.83 times that of unexposed patients
  - Risk for falling increased by 83% in patients exposed to benzos (RR = 1.83, 95% CI = 1.56-2.15)
  - Number needed to treat is 5; thus benzos would need to be withheld from 5 patients to prevent 1 fall in the relevant population

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Benzo Present

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Results – Univariate
Hypnotics

- 49% of entire sample received a hypnotic
  - 86% of those received diphenhydramine
  - Significant association between receipt of hypnotics and falls ($X^2 = 7.6$, $p = 0.006$)
    - Not in the direction expected
    - Patients who took hypnotics were 23% less likely to fall than those who did not receive hypnotics

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Hypnotic Present
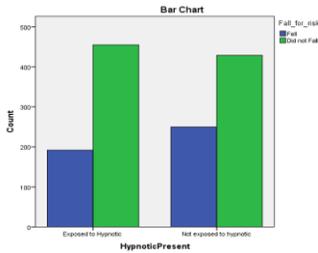
Results – Univariate
Laxatives

- 73% of the patients in this sample received laxatives
  - There was a significant association between taking laxatives and falling ($X^2 = 5$, $p = 0.025$)
  - The RR was 1.23, so patients taking laxatives were about 23% more likely to fall

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Results – Univariate
Opioids

- 92% of patients received some type of opioid
  - Because we had so few patients who <u>did not</u> receive opioids, we did not have enough power to accurately answer the question of whether opioids increased the risk of falls.

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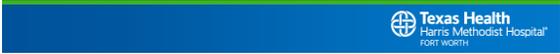
Results – Univariate
Diuretics

- Diuretics also had a significant relationship to falls on univariate analysis (X^2 = 26.8, p = 0.0001)
  - Relative risk was 1.5 (95%CI = 1.29 – 1.74), so risk of falling for patients on diuretics was 1.5 times that of patients not exposed to diuretics

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Results - Multivariate

Variable	B coefficient	Standard Error	Wald	df	Sig.	Exp(B)
LOS Days	.113	.011	100.258	1	.000	1.120
Hypnotic Present	-.403	.127	10.015	1	.002	.668
Benzo Present	.603	.129	21.747	1	.000	1.828
Constant	-1.620	.127	161.969	1	.000	.198

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Examples

The model is specific, but not very sensitive, i.e. it can give us a better idea of who will NOT fall than who will. About 33% of falls were predicted using this model, but 92% of non-fallers were identified.

The equation for this model:
Logit(Fall) = -1.620 +.113(LOS) - .403(hypnotic) + .603(Benzodiazepine)

For example if you have a patient who has been here 12 days and is taking alprazolam but no hypnotics:
Logit p= (.113 * 12) – 1.620 – 0 + (.603*1) = 1.356 – 1.620 +.603 = .339   and exp$^{(.339)}$ = 1.4   (This is the odds – or exp logit p)

Probability:
p/1-p = exp$^{(.339)}$/1+ exp$^{(.339)}$ = 1.4/2.4 = .58, so the probability of falling for this patient is 58%

If you have a patient who has been here only 3 days and is taking Benadryl, but no benzodiazepine, then
(.113 * 3) -1.620 -.403 + 0 = -1.684   and exp$^{(-1.684)}$ = .186
p/1-p = exp$^{(-1.620)}$/1+ exp$^{(-1.320)}$ = .186 / 1.186 = .16   This patient has about a 16% chance of falling

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Implications for Practice

- Staff to assist and remain present during toileting
- Enhanced awareness of medication associations with falls
- Product
  – Alarms
  – Non-slip footwear
  – Use of lift equipment

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Questions?