CAPTURE Falls

Collaboration and Proactive Teamwork Used to Reduce

Medication Review: Best Practices for Fall Risk Reduction in the Acute Care Setting

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Learning Objectives

- Review baseline data from 2011 hospital survey specific to pharmacist participation in fall risk reduction and use of medication review.
- List specific medication risk factors for increased fall risk.
- Identify pharmacist assessment tools and intervention techniques for reducing fall risk.

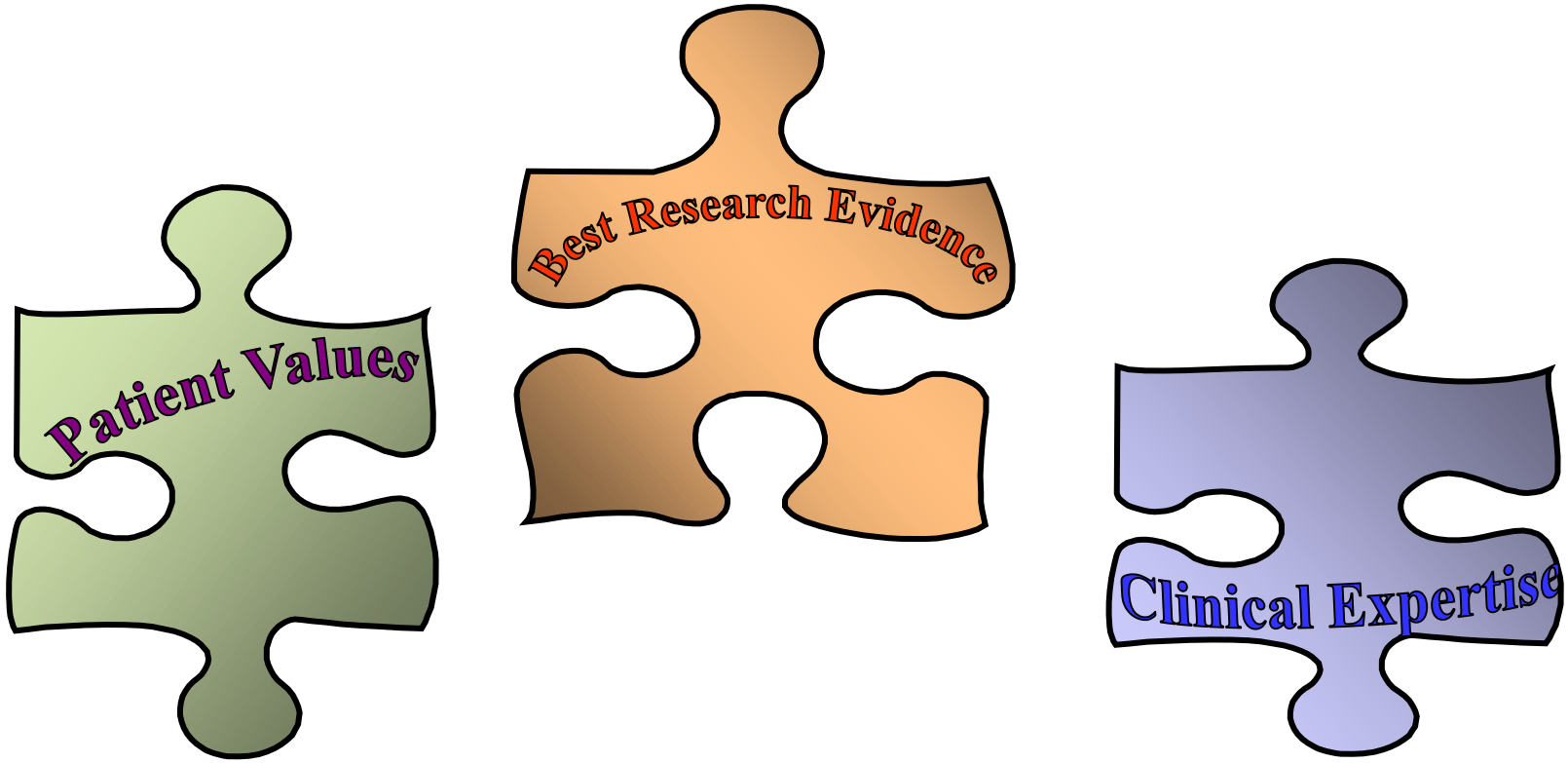
Part I: Introduction and Background

Introduction

Fall Reduction

- Fall risk has been reduced in studies where interprofessional team members were actively engaged in fall risk reduction efforts. *(Gowdy and Godfrey, 2003; Szumlas et al, 2004; von Renteln-Kruse and Krause, 2007)*
- An interprofessional team (vs. nursing only strategy) and use of benchmarks are associated with sustained improvement *(Sulla and McMyler, 2007; Krauss et al, 2008; Murphy et al, 2008)*

Evidence Based Practice...What is it?



"The integration of best research evidence with clinical expertise and patient values"

-Sackett et al., 2000, p.1

2011 Falls Survey in NE Hospitals

- Examined structures-processes-outcomes related to fall risk reduction.

- 70 of 83 general community hospitals in NE responded (84%)
  - 56 of 65 CAHs (86%)
  - 14 of 18 non-CAHs (78%)

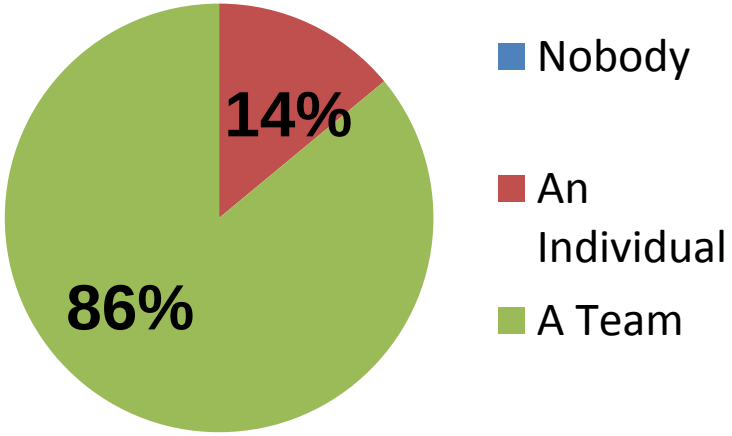
Baseline Survey Findings 2011

- Hospitals with a fall risk reduction team had the lowest fall and injury fall rates compared to hospitals where one person or no one was accountable for implementing a fall risk reduction program.
- 39% (N=22) of critical access hospitals (CAHs) (≤25 beds) that responded to the survey had either one individual or no one accountable for implementing a fall risk reduction program in their hospital.

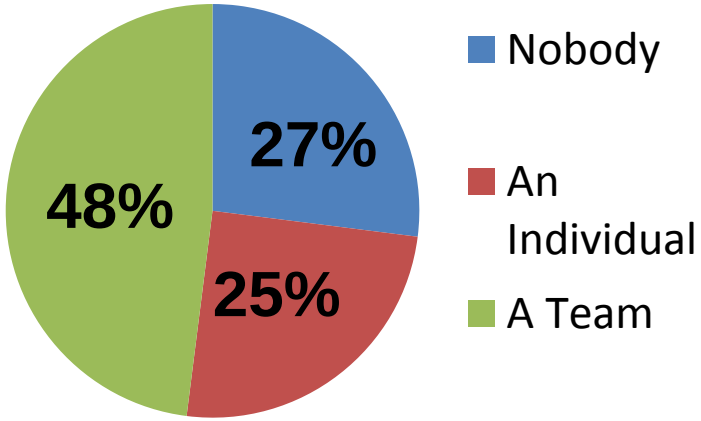
Fall Risk Reduction Strategies: Structures

Who is Accountable for Implementing Your Fall Risk Reduction Program?

Non-CAHs (46 – 689 Beds, n=14)

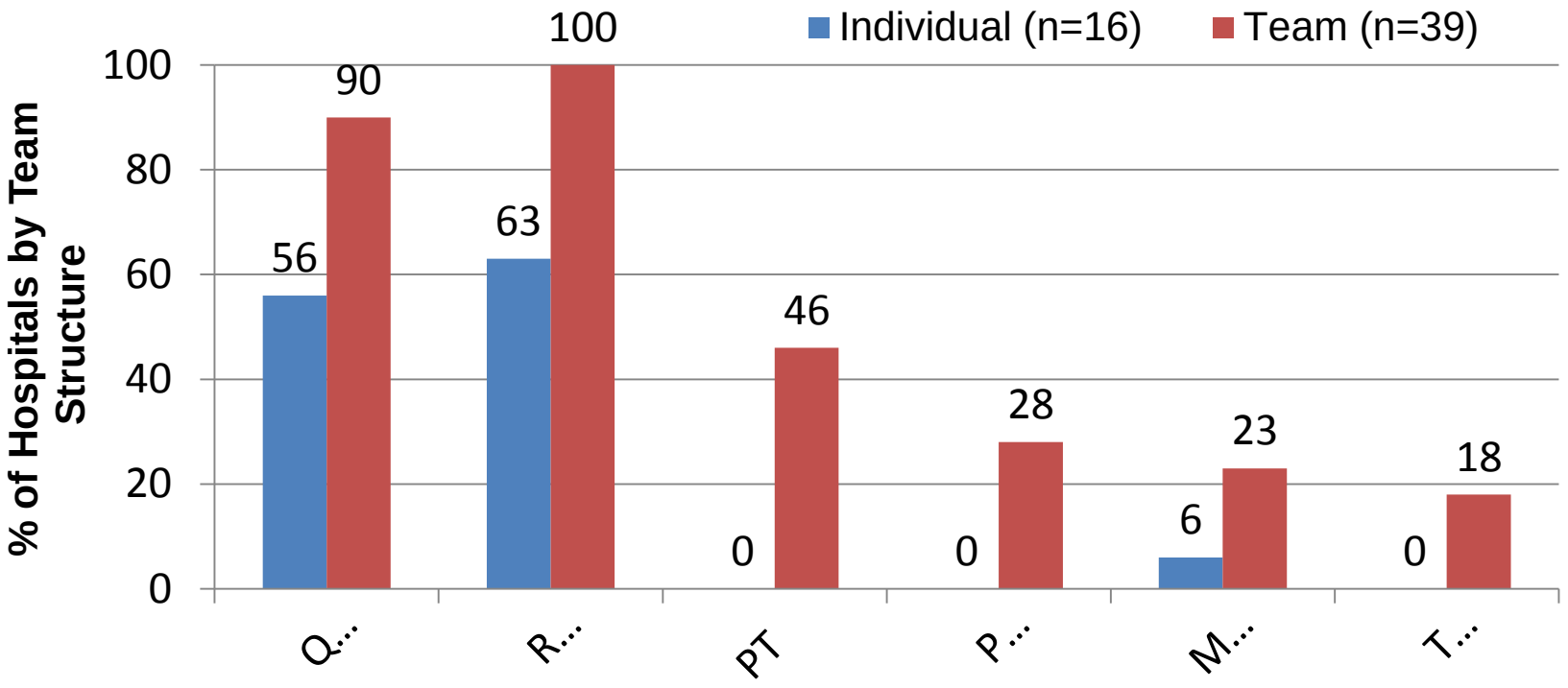


CAHs (12 - 25 Beds, n=56)



Fall Risk Reduction Strategies: Structures

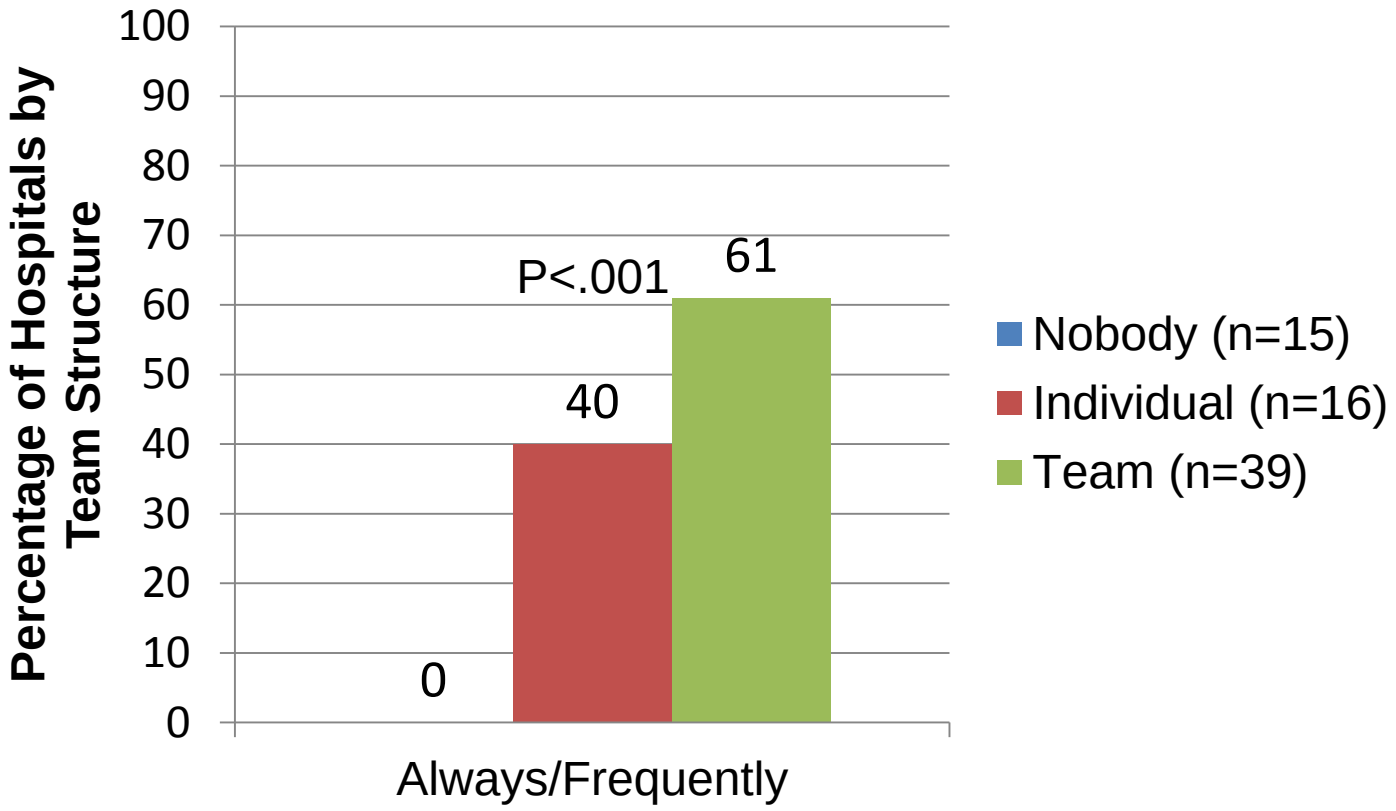
If you have a team, who is on it?



QM = Quality Manager; PSO = Patient Safety Officer; RM = Risk Manager; RN = Registered Nurse; DON = Director of Nursing; PT = Physical Therapist; Pharm = Pharmacist; MD = Physician or Medical Director ; Team= Interprofessional Team

Role of Teamwork

Do you integrate evidence from multiple disciplines to improve fall risk reduction efforts?



Fall Risk Reduction Strategies: Processes

Targeted Interventions	Nobody	Individual	Team
Elevated Toilet Seat	67%	75%	72%
Physical Therapy Evaluation	60%	56%	67%
Sitter	53%	63%	62%
Toileting Schedule	47%	63%	62%
Medication Review	**47%**	**50%**	**59%**
Occupational Therapy Evaluation	33%	31%	54%
Hip Protectors	7%	13%	18%

Fall Risk Reduction Strategies: Structure

Elements Consistent with AHRQ Patient Safety Fall Event Form	Nobody (n=11)	Individual (n=16)	Team (n=29)
Definition of fall on form	18%	0	10%
Was the fall unassisted or assisted?	0	17%	28%
Fall observed?	82%	100%	83%
Observed by whom?	64%	100%	76%
Patient sustain injury?	64%	83%	86%
Type of injury?	55%	67%	76%
Patient activity prior to fall?	100%	100%	79%
Risk assessment performed prior to fall?	18%	17%	41%
Patient determined to be at risk for a fall?	46%	67%	55%
Identify protocols interventions being used	55%	100%	79%
On medication(s) known to increase risk for a fall?	55%	83%	66%
Did medication contribute to fall?	18%	17%	10%

Pharmacist Impact

- RP comprehensive medication review in rehabilitation setting *(Haumschild MJ et al, 2003)*
  - Written recommendations for drug/dose changes
  - Emphasis on ADEs or conditions that increased fall risk
  - 47% reduction in falls
  - $300,000 estimated cost savings
  - Found decrease in number of medications correlated with decreased number of falls

Pharmacist Impact

- Clinical medication review by RP in care homes *(Zermansky AG et al, 2006)*
  - Falls decreased significantly in intervention group
  - 1/3 of medications stopped were CNS acting drugs

- Pharmacist has unique knowledge and skills to:
  - Critically review medications
  - Assess appropriateness of medication
  - Recommend medication interventions to minimize risk

Part II: Medication Risk Factors

Medication Risk Factors

Part II: Medication Risk Factors

- **Medications** = consistently associated with risk of falls *(Campbell et al, 1999; Close et al, 1999; Tinetti, 2003)*
- Common ways medications contribute to falls:
  - Sedation
  - Impaired balance/coordination/reaction time
  - Orthostatic hypotension
  - Parkinsonism
  - Cognitive changes

Part II: Medication Risk Factors

- Older adults at increased risk for medication-related adverse events due to:
  - Polypharmacy
  - Multiple co-morbidities
  - Multiple providers
  - Pharmacokinetic and pharmacodynamic changes associated with aging
  - Alterations in homeostatic mechanisms

Intrinsic Risk Factors

- Lower extremity weakness
- Previous falls
- Gait and balance impairment (2x higher risk)
- Visual impairment
- Depression
- Functional impairment
- Cognitive impairment (2x higher risk)
- Dizziness/vertigo (2x higher risk)
- Low body mass index
- Urinary incontinence
- Orthostatic hypotension
- Female sex
- Age > 80 years

(ABS/BGS Clinical Practice Guideline, 2010)

Intrinsic Risk Factors

- Medications
  - Polypharmacy (> 4 prescription medication)
  - Psychotropic medications
- Environmental factors

(ABS/BGS Clinical Practice Guideline, 2010)

Screening for Medication Fall Risk

Drug	Risk Factor
Antidiabetic agents	Hypoglycemia *(Berlie HD, Garwood CL, 2010)*
Cardiovascular agents	Orthostatic hypotension, dizziness, syncope, bradycardia
Psychotropic agents	Psychomotor impairment, sedation, orthostatic hypotension, confusion
Analgesics	Sedation, confusion
Metoclopramide	Psychomotor impairment, sedation
Anticonvulsants	Sedation, psychomotor impairment, confusion
Antihistamines	Sedation, confusion, blurred vision

Part III: Assessment and Interventions

Assessment and Interventions

2010 AGS/BGS Guideline for Fall Prevention

- All older persons should be asked about falling annually
- Persons who have fallen should have gait & balance assessed using one of available tools
- Those who perform poorly on standardized gait and balance test should be given a multifactorial fall risk assessment
  - *Focused medical history*
  - Physical examination
  - Functional assessment
  - Environmental assessment

2010 AGS/BGS Guideline for Fall Prevention

- Multifactorial fall risk assessment should include review of all medications (RX and OTC)
- Interventions for persons living in community
  - Withdrawal or minimization of psychoactive medications [B]
  - Withdrawal or minimization of other medications [B]
  - Management of orthostatic hypotension
- Interventions for LTC residents
  - Vitamin D (≥800 units/day) should be provided to LTC residents with vitamin D deficiency [A]
  - Vitamin D (≥ 800 units/day) should be considered LTC residents with abnormal gait/balance who are otherwise at increased risk of falls [B]

2010 AGS/BGS Guideline for Fall Prevention

- Professional/team conducting the assessment should directly implement the interventions or should assure that interventions are carried out by other qualified HC professionals. [A]

Strength of evidence [A] = good evidence that the intervention improves HC outcomes and benefits substantially outweigh harm.

Strength of evidence [B] = fair evidence found that intervention improves HC outcomes and benefits outweigh harm

Medication History

- Accurate and complete history is critical:
  - Prescription medications
  - OTC medications
  - PRN medications
  - Vitamins, dietary supplements
  - Complimentary and alternative medications
  - Alcohol
- Having patients bring medications into clinic is helpful in obtaining accurate history and determining compliance

Evaluation

- Review medications for:
  - Indication/appropriateness
  - Effectiveness
  - Safety: adverse effects, drug interactions, drug/disease interactions
  - Appropriate dose, interval, duration
  - Monitoring
  - Adherence: overuse, underuse

Evaluation

- Many facilities enlist pharmacy after patient falls or is identified at risk for falling
- Pharmacist review should begin with initial fall assessment and continue with new medication orders
- CPOE and pharmacy software can alert caregivers when high risk medications are ordered

Interventions to Minimize Drugs

- Identify indication for drug discontinuation, minimization, or substitution
- Prioritize medications for discontinuation, minimization, or substitution
- Coordination/communication of intervention(s) with provider/patient
- Monitoring for outcome of intervention(s)

Patient Prioritization

- Patients with fall history
- Patients on >4 prescription medications
- Patients on psychotropic medications
- Risk for injury (ABCs)
  - Age 85 +
  - Brittle bones (osteoporosis)
  - Coagulation medications
  - Surgical post-op
- High risk drugs (point system)

Pharmacist Tools

- No perfect tool exists
- Consider team structure
- Select tool that works best for your institution
  - Ease of use
  - Cost, training, staff time
- Communication of risk is key!!
  - Documentation in patient record
  - Assessment, recommendation, provider response

Medication Fall Risk Score

Medication Fall Risk Score Numeric Value Points (Beasley et al, 2008)		
Point Value	**AHFS Class**	**Comments**
3	Analgesics, antipsychotics, anticonvulsants, benzodiazepines	Sedation, dizziness, postural hypotension, altered gait and balance, impaired cognition
2	Antihypertensives, cardiac agents, antiarrhythmics, antidepressants	Orthostasis, impaired cerebral perfusion
1	Diuretics	Increased ambulation, orthostasis
Total score ≥6	Higher risk for fall; evaluate patient	

Interventions:

- Discontinue medications
- Decrease medication dose
- Use alternative therapeutic agent
- Monitor laboratory values
- Educate patient

Medication Fall Risk Score

- Mercy Health Center, Oklahoma City, OK
- October 2005-December 2007
- Overall total fall rate decreased by 36%
- Overall fall injury rate decreased by 44%
- Identified patients at increased risk for falls based on medications alone

Pharmacist Fall Risk Assessment

Section I: History of Falls/Conditions			
1 or 2 falls in a month/quarter	2	Unsteady or shuffling gate	2
More than 2 falls in a month/quarter	8	Confusion/delirium/disorientation	2
Fall-related fracture (date): _____	5	Agitation/increased anxiety	2
Postural hypotension	2	Syncope/dizziness	1
Decreased hearing	1	Aphasia	1
Decreased vision	1	Agitation/increased anxiety	2
		Section I Subtotal: _____	

(Cooper JE, Burfield AH, 2009)

Pharmacist Fall Risk Assessment

Section II: Medications			
Cardiovascular	1	Benzodiazepine	2
Antihypertensive	1	NSAID	1
Diuretic	1	Narcotic analgesic (mild)	1
Antipsychotic	2	Narcotic analgesic (moderate)	2
Hypnotic	2	Anticonvulsant	1
Sedating antidepressant	2	Hypoglycemic	1
Sedating antihistamine	2		
		Section II Subtotal: _____	

(Cooper JE, Burfield AH, 2009)

Pharmacist Fall Risk Assessment

Section III:			
Bowel incontinence	2	Dementia	1
Bladder incontinence	2	Parkinsonism	1
Arthritis	1	Seizures	1
Cast/splint/sling	1	Stroke	1
Prosthesis	1	Arrhythmia	1
		Congestive heart failure	1
		Section III Subtotal: _____	
		Total Score: _____	

Risk ranges: minimal 0-3, moderate 4-7, high ≥ 8

Describe interventions:_____

(Cooper JE, Burfield AH, 2009)

Pharmacist Fall Risk Assessment

- Interventions:
  - Discontinue medication
  - Decrease dose
  - Eliminate duplication
  - Change to alternative agent
  - Monitor laboratory values
  - Other as deemed appropriate by pharmacist

(Cooper JE, Burfield AH, 2009)

Medication Interventions

Drug	Interventions
Antidiabetic agents: insulin sulfonylureas meglitinides	(Hypoglycemia) Interventions: 1) avoid long-acting oral agents 2) glipizide is sulfonylurea of choice 3) monitor carefully 4) avoid tight glycemic control

(Cooper JE, Burfield AH, 2009)

Medication Interventions

Drug	Risk Factor
Cardiovascular agents: diuretics beta-blockers alpha-blockers vasodilators clonidine methyldopa antiarrhythmics digoxin	(Orthostatic hypotension, dizziness, syncope, bradycardia) Interventions: 1) avoid clonidine, methyldopa 2) ACE inhibitors or ARBs are preferred 3) monitor for orthostatic changes 4) monitor for dehydration; electrolytes 5) avoid over control of BP 6) avoid digoxin >0.125mg in CHF 7) avoid alpha-blockers as monotherapy for HTN 8) Rate control preferred over rhythm control for atrial fibrillation

(Cooper JE, Burfield AH, 2009)

Medication Interventions

Drug	Interventions
Psychotropic medications: antipsychotics antidepressants benzodiazepines sedative/hypnotics	(Psychomotor impairment, sedation, orthostatic hypotension, confusion) Interventions: 1) use sleep hygiene for insomnia 2) eliminate drug causes of insomnia 3) minimize doses or taper and withdraw drugs 4) use SSRI for treatment of anxiety 5) use behavioral interventions for agitation associated with dementia 6) reduce number of psychotropic medications 7) monitor AIMS assessment

(Cooper JE, Burfield AH, 2009)

Medication Interventions

Drug	Risk Factors
Analgesics: opioids NSAIDs	(Sedation, confusion) Interventions: 1) use APAP up to 4g/day 2) use topical analgesics (counterirritants, lidocaine) 3) opiates: start low with longer intervals and titrate slowly 4) avoid indomethacin, meperidine, methadone, pentazocine
Metoclopramide	(Psychomotor impairment, sedation) Interventions: 1) avoid use in GERD 2) monitor AIMS assessment

(Cooper JE, Burfield AH, 2009)

Medication Interventions

Drug	Risk Factors
Anticonvulsants:	(Sedation, psychomotor impairment) Interventions: 1) titrate slowly and carefully 2) adjust doses based on renal and hepatic function
Anticholinergic agents: antimuscarinics antihistamines muscle relaxants GI antispasmodics	(Sedation, confusion) Interventions: 1) use non-pharmacologic interventions for bladder control 2) use non-sedating antihistamines (loratadine, fexofenadine) 3) avoid muscle relaxants 4) consider bulk-forming fiber for IBS

(Cooper JE, Burfield AH, 2009)

Vitamin D

- Vitamin D deficiency is associated with muscle weakness and increased falls (*Fosnight SM el al, 2008)*
  - Older adults should receive vitamin D 800-1000 units daily
    - Overall RR of 0.86 (95% CI 0.70-0.93) suggesting 14% lower risk of falls *(Kalyani RR et al, 2010)*
  - Calcium intake should be 1200-1500mg daily via diet or supplements
  - Vitamin D deficiency:
    - Total 25OH vitamin D <30
    - Vitamin D 50,000 units twice weekly X5 weeks

Contact Information

Provide feedback or ask questions
by contacting us via email

CAPTURE.Falls@unmc.edu

Fall Prevention Resources

- Institute for Healthcare Improvement: Falls Prevention http://www.ihi.org/offerings/MembershipsNetworks/MentorHospitalRegistry/Pages/FallsPrevention.aspx
- VA National Center for Patient Safety: Falls Toolkit: www.patientsafety.gov
- Centers for Disease Control and Prevention: Falls-Older Adults http://www.cdc.gov/HomeandRecreationalSafety/Falls/pubs.html
- The American Geriatrics Society (search Falls within website for resources) www.americangeriatrics.org or igeriatrics app
- Institute for Clinical Systems Improvement: Prevention of Falls (Acute Care) https://www.icsi.org/guidelines__more/catalog_guidelines_and_more/catalog_guidelines/catalog_patient_safetyreliability_guidelines/falls/

Fall Prevention Resources

- Agency for Healthcare Research & Quality National Guidelines Clearinghouse: Preventing falls in acute care www.guideline.gov
- Hill-Rom: Safe Patient Handling and Fall Prevention www.hill-rom.com
- Registered Nurses Association of Ontario Clinical Practice Guidelines http://rnao.ca/sites/rnao-ca/files/Prevention_of_Falls_and_Fall_Injuries_in_the_Older_Adult.pdf

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http://www.unmc.edu/patient-safety/capture_falls.htm

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