Appendix A: Common Medications Affecting Balance and Mobility

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Antihypertensives

Mechanism of Action on Balance

Antihypertensive medications reduce blood pressure, which can lead to orthostatic hypotension; a drop in blood pressure when changing from lying or sitting to standing positions. This sudden decrease in cerebral perfusion can cause dizziness, lightheadedness, and falls.

High-Risk Medication Classes

- *ACE inhibitors and ARBs*: Can cause vasodilation leading to postural changes
- *Diuretics:* Volume depletion increases orthostatic hypotension risk
- *Beta-blockers:* May impair heart rate response to position changes
- *Calcium channel blockers:* Peripheral vasodilation effect
- *Alpha-blockers:* Direct vasodilation with significant orthostatic effects

Monitoring Strategies

- Orthostatic vital signs: Measure BP and HR lying, sitting, and standing at 1 and 3 minutes
- Home BP monitoring: Track patterns and timing of hypotensive episodes
- Symptom diary: Document dizziness, lightheadedness, or near-falls
- Functional assessments: Timed up-and-go test, tandem walk
- Medication timing review: Consider splitting doses or timing with meals

Clinical Considerations

- Start with lowest effective dose and titrate slowly
- Educate patients on rising slowly from seated/supine positions
- Adequate hydration and sodium intake (unless contraindicated)
- Consider medication timing - avoid bedtime dosing for short-acting agents
- Regular review of medication necessity and dosing

Psychotropics

Mechanism of Action on Balance

Psychotropic medications affect the central nervous system through various neurotransmitter pathways, leading to sedation, cognitive impairment, and movement disorders that directly impact balance and coordination.

High-Risk Medication Classes

- *Antipsychotics:* Dopamine blockade causing extrapyramidal symptoms
- *Benzodiazepines:* GABA enhancement leading to sedation and muscle relaxation
- *Tricyclic antidepressants:* Multiple receptor effects including anticholinergic
- *Anticonvulsants:* CNS depression and coordination effects
- *Sleep aids:* Residual sedation and cognitive impairment

Specific Balance-Related Effects

- Sedation: Decreased alertness and reaction time
- Extrapyramidal symptoms: Tremor, rigidity, bradykinesia, tardive dyskinesia
- Anticholinergic effects: Confusion, blurred vision, dry mouth
- Cognitive impairment: Decreased attention and processing speed

Monitoring Strategies

- Sedation scales: Richmond Agitation-Sedation Scale (RASS) or similar
- Movement disorder assessments: Abnormal Involuntary Movement Scale (AIMS)
- Cognitive screening: Mini-Mental State Exam or Montreal Cognitive Assessment
- Fall risk assessments: STRATIFY or Morse Fall Scale
- Functional mobility tests: Berg Balance Scale, Dynamic Gait Index

Clinical Considerations

- Use lowest effective dose and shortest duration possible
- Consider medication timing to minimize daytime sedation
- Regular assessment for extrapyramidal symptoms
- Gradual dose reductions when discontinuing
- Alternative medications with lower fall risk profiles

Anticholinergics

Mechanism of Action on Balance

Anticholinergic medications block acetylcholine receptors in both central and peripheral nervous systems, leading to cognitive impairment, visual disturbances, and decreased proprioception that significantly affect balance and spatial awareness.

Common Anticholinergic Medications

- *Antihistamines:* Diphenhydramine, chlorpheniramine
- *Tricyclic antidepressants:* Amitriptyline, nortriptyline
- *Antispasmodics:* Oxybutynin, tolterodine
- *Anti-nausea medications:* Scopolamine, promethazine
- *Muscle relaxants:* Cyclobenzaprine

Balance-Related Effects

- Central effects: Confusion, delirium, impaired attention
- Visual effects: Blurred vision, difficulty with depth perception
- Peripheral effects: Dry mouth, constipation (secondary effects on mobility)
- Cognitive effects: Memory impairment, processing delays

Monitoring Strategies

- Anticholinergic burden scales: Drug Burden Index or Anticholinergic Cognitive Burden Scale
- Cognitive assessments: Regular screening for delirium and confusion
- Visual acuity testing: Routine eye exams and near/distance vision checks
- Balance assessments: Romberg test, single-leg stance
- Medication reviews: Regular evaluation of anticholinergic load

Clinical Considerations

- Calculate total anticholinergic burden across all medications
- Consider alternatives with lower anticholinergic activity
- Monitor for cumulative effects when multiple anticholinergic agents are used
- Particular caution in elderly patients and those with cognitive impairment
- Regular medication reconciliation and deprescribing when appropriate

Hypoglycemic Agents

Mechanism of Action on Balance

Hypoglycemic episodes cause neuroglycopenia, affecting brain function and leading to confusion, weakness, tremor, and coordination problems that significantly increase fall risk and impair mobility.

High-Risk Medications

- *Insulin:* All formulations, especially long-acting
- *Sulfonylureas:* Glyburide, glipizide, glimepiride
- *Meglitinides:* Repaglinide, nateglinide
- *Combination products:* Fixed-dose combinations containing above agents

Hypoglycemia-Related Balance Effects

- Neurological symptoms: Confusion, difficulty concentrating, altered mental status
- Physical symptoms: Tremor, weakness, fatigue, sweating
- Autonomic symptoms: Palpitations, anxiety, irritability
- Severe hypoglycemia: Seizures, loss of consciousness

Monitoring Strategies

- Blood glucose monitoring: Regular home glucose checks, especially during medication adjustments
- HbA1c targets: Individualized goals considering fall risk vs. glycemic control
- Hypoglycemia tracking: Symptom logs and glucose readings during episodes
- Medication adherence: Regular review of dosing and timing
- Nutritional assessments: Meal timing and carbohydrate consistency

Clinical Considerations

- Individualized glycemic targets (less stringent for high fall-risk patients)
- Prefer medications with lower hypoglycemia risk (metformin, DPP-4 inhibitors)
- Patient and caregiver education on hypoglycemia recognition and treatment
- Regular review of medication regimens and dose adjustments
- Consider continuous glucose monitoring for high-risk patients

Comprehensive Monitoring Framework

Risk Assessment Tools

- Fall risk scales
  - Morse Fall Scale
  - STRATIFY
  - Johns Hopkins Fall Risk Assessment
- Medication risk tools
  - STOPP/START criteria
  - Beers Criteria
- Functional assessments
  - Activities of daily living
  - instrumental ADLs

Multidisciplinary Approach

- Pharmacist consultation: Medication reviews and optimization
- Physical therapy: Balance training and mobility assessments
- Occupational therapy: Home safety evaluations
- Primary care coordination: Regular medication reconciliation

Patient Education Components

- Recognition of medication-related symptoms
- Proper medication timing and administration
- Environmental safety modifications
- When to seek medical attention

Documentation and Communication

- Clear documentation of fall risk factors
- Communication between healthcare providers
- Patient and caregiver education materials
- Regular reassessment schedules

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