Prevention and Management of Delirium for Patients at Risk for Falls with Injury

An Integrative Review of the Evidence

June – August 2012

A Topic Summary of the Evidence

Clinical Question: What is the quantity, quality, and consistency for effective interventions for acute care medical/surgical patients at high risk of delirium and falls with injury?

Evidence Search Strategies: An integrative review on the selected clinical question was conducted from June to August 2012 to determine the quantity, quality, and consistency of the evidence. This review examined the effective strategies involved in (a) prevention and management of delirium for at-risk patients and (b) preventing harm from falls for these high-risk patients. A review of the research evidence from 2000-2012 was conducted via electronic databases (Cochrane Library Trials, Cochrane Library Review, Ovid/ Medline, Proquest, Joanna Briggs Institute, PubMed, British Medical Journal, Science Direct) using the search terms of “delirium”, “falls”, and “injury” either alone, mixed, or in combination. This review yielded 27 relevant hits and, after eliminating duplicates, 23 articles were selected as relevant for inclusion. 3 other articles were located via contextual and reference links, for a total of 26 articles. After careful examination, 12 articles were eliminated, as they did not answer the clinical question or targeted inappropriate patient populations and/or institutional settings. Article inclusion and exclusion was confirmed by an independent reviewer. The remaining 14 articles pertained to the clinical area of inquiry and were reviewed in detail over a two month period. The strength of the research evidence evaluated for this integrative review ranges from insufficient to good, with the majority of the evidence as insufficient. Result limitations include difficulty in defining delirium across healthcare specialties, a lack of randomized controlled trials, multiple evidence methodologies with conflicting results, dissimilar population settings, varying sample and effect size, inability to capture accurate cost savings, and a multitude of diverse interventions for delirium management and prevention, as well as the inability to generalize some research results to the Kaiser Permanente patient population. There was difficulty aligning delirium interventions with interventions for patients at risk for falls with injury; therefore, this review will focus on effective interventions for patients at high risk of delirium. The information presented in this review provides the best evidence to date for clinicians to structure innovative interventions and programs for delirium.

Evidence Summary: Two geriatric syndromes, delirium and falls, are associated with prolonged length of stay, increased healthcare costs, and substantial morbidity. Delirium can be triggered by multiple combinations of physiological, psychological, sociological, and environmental factors and develops across various healthcare settings and patient conditions. Due to delirium’s fluctuating nature and varied presentation, delirium has long been underrecognized and underdiagnosed. However, drug-induced delirium is increasingly being identified in U.S. hospitalized patients, which highlights the inclusion of pharmacy consultation. Pharmacist involvement throughout the patient’s hospital stay is critical to the prevention and management of delirium, as is increasing all healthcare professional’s knowledge and awareness of early recognition, rapid response, and management of delirium.

Delirium is a particular concern within the surgical arena. Time from admission to operation greater than 48 hours and a BMI less than 20.0 kg/m2 have identified as independent risk factors for developing delirium. Individual clinical assessments can identify geriatric syndromes and delirium symptoms that may impede a patient’s ability to follow falls prevention and other types of patient safety programs. Interdisciplinary interventions, combined with multifactorial interventions, can potentially reduce the incidence and shorten the duration of delirium and improve patient outcomes. Nurses are integral in the development and implementation of the evidence-based practices needed to prevent complications resulting from delirium.

There is conflicting evidence concerning specific delirium interventions. Although re-orientation therapies have proven successful, one study found that nursing staff’s attempt to guide patients back to reality made patients mistrust their experiences, caused them undue stress, and deepened their delirium. The use of delirium rooms has also been linked to improved patient outcomes; however, one study on delirium room use found no differences in mortality or length of stay for patients with and without delirium. Evidence is also conflicting regarding whether elderly males or elderly females are more at risk for delirium development. The large number of multi-dimensional variables, risk factors, and settings that place patients at risk for delirium makes the prevention and management of this condition difficult. Effective delirium strategies require finding the right combination of therapies to design easy-to-administer interventions that can be applied across the inpatient care continuum. The continuation of safe and stable patient care environments requires collaborative interdisciplinary teamwork and a systematic programmatic approach incorporating an evidence-based delirium framework to
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Based on the reviewed evidence, the following recommendations are offered for consideration: Use an evidence-based programmatic framework to establish a caring culture of safety in order for the hospitalized patient at risk for delirium and falls with injury to feel, act, and be safe.

- **Design**
  - Ensure the strategic programmatic infrastructure of a nurse-driven delirium prevention and management program involves Quality Improvement & Risk Management and includes assessment, implementation, monitoring, reporting, and evaluation systems.
  - Involve a dedicated interdisciplinary delirium prevention team, including a pharmacist, in the multimodal design of multicomponent evidence-based strategies, guidelines, and protocols in order to standardize and customize patient population practice changes.

- **Prevention**
  - Establish a system for geriatric syndrome screening based upon a delirium risk assessment tool and a falls risk assessment scale used upon admission, every shift, transfers, and any clinical status change.
  - Support nonpharmacological approaches for delirium prevention and management through medication review/reconciliation with pharmacy, re-orienting/re-validation therapies, and a stable care environment.
  - Assess surgical populations for delirium development risk, particularly orthopedic cases, by detecting and recognizing cognitive changes during the pre and post-operative monitoring period.
  - Educate patient, family, and interdisciplinary staff about delirium risk via tailored education focusing on population-based risk factors, targeted staff surveillance and awareness, and delirium prevention/management strategies.
  - Form collaborative relationships with family and friends in order to facilitate descriptions of patient fall patterns and recognition of patient behavioral changes.

- **Rescue**
  - Use evidence-based delirium/falls programs to customize patient care and facilitate early delirium detection/recognition, manage delirium symptoms, and respond promptly to delirium escalation and falls with injury.
  - Obtain pharmacy consultation for specific pharmacologic approaches for patients deemed a safety risk (delirium symptoms threaten their own safety, the safety of others, and/or would result in the interruption of essential therapy).

- **Protection**
  - Establish open communication and disclosure between patients, family, interdisciplinary staff, and hospital departments about delirium and fall injury risk upon admission and throughout the hospital stay.
  - Provide a safe and stable care environment to support nurse surveillance and the rapid and complete assessment and treatment of at-risk patients.

The major components of multimodal delirium programs include:
- Systems approach for individualized patient populations
- Stable care environment focused on patient/family centered care
- Interprofessional care coordination of care
- Appropriate staffing levels and mix
- Increased knowledge of geriatric syndromes
- Early recognition, detection, and rapid response
- Nonpharmacological, restraint free, and nontraditional approaches
- Effective communication
- Evidence-based guidelines, protocols, and assessment tools
- Beers Criteria Medication review with pharmacy consultation
- Infection, pain, and pre/post-operative monitoring

customize interventions and embed them into delirium programs (See Delirium Model, Appendix A, page 22). The major components of multimodal delirium programs include:

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Organizational Factors (4,10,11)

- Delirium as a Marker for Quality Care: (4)
  - Delirium meets Williamson’s criteria for an indicator of the quality of health care (4)
  - Common, frequently iatrogenic, and integrally linked to processes of care (4)
  - After adjusting for case mix, higher delirium rates could possibly correlate with lower quality of hospital care (4)
  - Shifts in policies and system-wide changes are required in order to reduce to the incidence of delirium on a national scale and provide high-quality care for older persons (4)

- Fall Prevention Best Practices Infrastructure: (10)
  - Fall prevention best practices should incorporate the following components: (10)
    - Organizational policies (10)
    - Clinical practice (10)
    - Empiric evidence base (10)
    - Ethical considerations (10)
      - Respect for autonomy, personhood, and liberty versus duty of care to maintain safety (10)
      - Balance between a duty of care to all patients vs. “high-risk” patients (10)
    - Cultural considerations (10)
      - Attitudes toward risk of patients, public, caregivers, and different cultural groups (10)
    - Legal considerations (10)
      - Negligence law, human rights law, rulings on mental capacity, or restriction of liberty (10)

- Implications for Clinical & Organizational Practice (10,11)
  - “Never event” approach could motivate health care providers to innovate and invest in fall prevention strategies (10)
    - Conversely, it could lead to a risk-averse, overly custodial approach to patient care (10)
    - Risk that an excessive focus on fall prevention could lead to intrusive levels of observation that compromise dignity or make patients feel restricted dominated by fear of complaint, litigation, or failure to reimburse (10)
  - Risk-averse approach to falls could have a negative impact seen in rehabilitation, increased length of stay, or loss of patient function or fitness (i.e., harmful effects of bed rest, inappropriate use of restraint devices or bedrails, or chemical restraints) (10)
  - Delirium prevention requires health care systems to support comprehensive and reliable delivery so that providers can implement all interventions/strategies all of the time to all of the patients who are at risk and provide a tailored intervention to meet each patient’s needs (11)

Definitions: (1,4,5,7,8,9,12,13,14)

- Delirium (acute confusional state): An acute disorder of attention and cognition that represents a syndrome of disruption of one’s state of consciousness, concentration, perception, memory, cognition, orientation, and psychomotor behavior (1,4,8,14). **NOTE:** Definition of delirium varies according to criteria utilized (9).
  - Can develop any time during hospitalization (1)
  - Diagnosis based primarily clinical and based on careful bedside observation of key features; understanding its clinical features is crucial for diagnosis (4)

- Clinical Features (4)
  - Acute onset (1,4,5,7,8,12,14)
    - Occurs abruptly over a period of hours or days (4)
    - Typically presents early in the post-operative period (1)
    - Reliable informant often needed to ascertain time course of onset (4)
  - Fluctuating course (1,4,5,13)
    - Symptoms tend to come and go or increase/decrease in severity over 24-hours (4)
    - Persists for hours to days (1)
    - Characteristic lucid intervals (4)
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- Inattention (1,4,5,7)
  - Difficulty concentrating, focusing, sustaining, and shifting attention (4)
  - Difficulty maintaining conversation or following commands (4)
- Disorganized thinking (4,5)
  - Disorganized or incoherent speech (4)
  - Rambling or irrelevant conversation or an unclear or illogical flow of ideas (4)
- Altered level of consciousness (1,4,5,7)
  - Changes in state of alertness (1)
  - Clouding of consciousness, with reduced clarity of awareness of the environment (4)
- Cognitive deficits (4,7,14)
  - Global or multiple deficits in cognition, including disorientation, memory deficits, and language impairment (4)
- Perceptual disturbances (4,7,14)
  - Illusions or hallucinations in about 30 percent of patients (4)
  - Delusions (14)
- Psychomotor disturbances (hyperactive, hypoactive, mixed) (4)
- Altered Sleep-Wake Cycle (4)
  - Characteristic sleep-cycle disturbances (4)
  - Daytime drowsiness, nighttime insomnia, fragmented sleep, or complete sleep-cycle reversal (4)
- Emotional Disturbances (4)
  - Common; intermittent and labile symptoms of fear, paranoia, anxiety, depression, irritability, apathy, anger, or euphoria (4)

- Geriatric Syndromes: A multifactorial condition occurring primarily in frail elderly which is usually due to multiple contributing factors and results from an interaction between patient-specific impairments and situation-specific stressors (7)
- Hyperactive Delirium: Psychomotor activity is increased and marked by prominent agitation and vigilance (4,13)
  - Can be misdiagnosed as an anxiety state (13)
  - May perceive environment as hostile or threatening (13)
  - May be provoked to abscond from setting (13)
  - Increased risk of self harm re: dislodgment of life support and monitoring equipment (13)
- Hypoactive Delirium: Psychomotor activity is decreased and marked by lethargy, with a markedly decreased level of motor activity (4,13)
  - Misdiagnosed as depression or undetected (13)
- Mixed Delirium: Mixtures of features from hyperactive and hypoactive delirium (4)
- Dementia: (NOTE: For the purposes of this integrative review on delirium, dementia will not be included) Decline in mental function caused by a number of conditions (Alzheimer’s disease, Lewy body dementia, Pick’s disease, Creutzfeldt–Jacob disease [CJD], Parkinson’s disease). Marked by a gradual onset with irreversible loss of intellectual ability and loss of short-term memory. More common in older people (14)

- Hospitalized Patients with Delirium: Background (1,4,8,9,11,13) **Conflicting evidence
  - Delirium represents one of the most common, life-threatening, and potentially preventable clinical syndromes among hospitalized persons >65 yrs (4,11)
    - One third of all delirium episodes could be prevented (11)
    - Often initiates a cascade of events culminating in loss of independence, increased risk of morbidity and mortality, and increased health costs (4)
  - Hospitalization patterns of different categories of delirium have changed and different categories of delirium have different associations, such as drug-induced delirium, dementia-associated delirium, and non-dementia, non-drug (NDND) (9)
    - **Delirium is underrecognized and underdiagnosed (9,11,13)
      - Hypoactive form of delirium likely under-diagnosed (9,13)
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- Under-recognition may occur re: delirium’s fluctuating nature and varied presentation (9)
- Delirium superimposed on dementia is common but frequently unrecognized (9)
  - **Drug-induced delirium is being increasingly identified in U. S. hospitalized patients from 1998 to 2005 (9)**
  - Availability of simple and sensitive assessment tools may have contributed to greater recognition of delirium from 1998 to 2005 in the U. S. (9)
  - Increased use of medications that precipitate delirium (9)
- Heightened awareness (9)
  - Increased awareness may have been promoted by programs such as Hospital Elders Life Program (HELP) (9)
  - Availability of simple and sensitive assessment tools (9)

➤ Delirium Prevention Strategies (4,7,8,9,11,12,13)

- Large number of multi-dimensional variables, risk factors, and environments that predispose individuals to develop delirium makes the prevention of this condition a difficult task (13)
- Delirium is a common but serious condition among hospitalized elderly patients and in some cases can be prevented (4,7,8)
  - Prevention of delirium is the best strategy (4)
  - Effective treatment strategies require recognition of patients at risk for delirium (12,13)
  - Manage all evident causes/contributing factors, provide supportive care, prevent complications, and treat behavioral symptoms (4)
  - Medical emergency - address predisposing and precipitating factors promptly (4)
- Recommended effective strategies and essential components for a delirium prevention program (O’Mahony et al., 2011 for NICE Recommendations) (4,7,9,11)
  - Multicomponent intervention program approach (4,9)
    - Addressing multiple rather than single predisposing factors may have more potential in delirium prevention strategies (9)
  - Multidisciplinary teams (11)
  - Educational component for all team members (11)
  - Stable care environment (care team and location) (11)
  - Individualized patient assessment on admission and daily for all forms of delirium (4,7,11)
    - Brief cognitive assessment using a standardized and validated screening tool (See Delirium Risk Assessment Tools Section) (7)
  - Screening elderly patients for the presence of common geriatric syndromes (7)
  - Review all preadmission and current medications (4,11)
  - Orienting (11)
  - Communication (11)
  - Therapeutic activities (11)
  - Early mobilization and walking (11)
  - Nonpharmacologic approaches to sleep (11)
  - Maintaining nutrition and hydration (9)
  - Adaptive equipment for vision and hearing impairment (11)
  - Infection control (11)
  - Preventing hypoxia (11)
  - Pain management (11)

➤ Delirium Prevention Resources and Tools (4,6,9,13)

- **Protocols/Guidelines (4,6,9,13)**
  - Improve clinician awareness and prevent functional/cognitive decline in at-risk patients via a delirium prevention protocol (9)
    - However, a widely accepted management protocol of delirium is yet to be established (13)
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- Yale Delirium Prevention Trial demonstrated the effectiveness of intervention protocols targeted toward six risk factors: (4)
  1. Orientation and therapeutic activities for cognitive impairment (4)
  2. Early mobilization to avert immobilization (4,6)
  3. Nonpharmacologic approaches to minimize use of psychoactive drugs (4,6)
  4. Interventions to prevent sleep deprivation (4,6)
  5. Communication methods and adaptive equipment (particularly eyeglasses and hearing aids) for vision and hearing impairment (4)
  6. Early intervention for volume depletion (dehydration) (4)

- Three delirium/acute confusion prevention protocols of orientation, nonpharmacologic sleep, and early mobilization demonstrate interventions involving pharmacological and nonpharmacological approaches (See Kratz [2008] for Acute Confusion Protocol Interventions) (6)
  - Resulted in a culture change in which these interventions became embedded in all of the nurses’ interactions with patients (6)
  - Restraint use fell from 8.7 restraint episodes to 1.33 per 1000 patient day (2004 to 2005) (6)
  - Medical-surgical unit experienced a 100% decrease in sitter usage the first year (6)
  - Use of medications known to cause acute confusion decreased by more than 50% (6)

Delirium Management Strategies (7,8,12,13,14)

- Customize patient care by focusing on treatment of illness that is based upon an underlying etiology and the pathophysiology that contributed to the behavioral change (8)
  - Behavior containment prevents customization of care (8)
- Strategies to promote the safety of confused patients: (13,14)
  - Early detection: first step towards developing treatment strategies and management (13)
  - Early recognition and management can effectively restore an older person to premorbid health and functioning (13)
  - Bed position on the ward & bed movement (14)
  - Arrangement of furniture & equipment (14)
  - Partnerships in care (14)
    - Family and friends have valuable knowledge about patient’s normal routine and behavior
      - Confusion can be escalated by an unfamiliar environment, which may appear hostile to the patient (14)
      - Chronic confusion becomes acute confusion: Family quickly recognizes changes in attitude or behavior (14)
      - Multiple falls: Patients usually display a pattern to their fall, which the family may be able to identify (14)
      - Family involvement: Utilized when patients are agitated, to increase surveillance, or in calming patient during treatments or procedures (14)
    - Effective communication & documentation (14)
      - Care provided for confused patients must be clearly documented (14)
      - All staff need easy access to patient information (14)
- Environmental (re-orientation therapy) and psychosocial (validation therapy) methods (13)
  - Both therapies promote restraint-free care and reduce likelihood of increased agitation (13)
  - Both therapies have been used by nurses for the treatment of delirium (13)
    - No standard formula or protocol used in the implementation of either therapy (13)
    - Practice variations may be explained by relative flexibility of both intervention, dependent upon delirium severity, patient populations, and context of practice (13)
  - Re-orientation Therapy: Uses environmental support measures to re-orient the patient to the here and now to minimize factors contributing to confusion (13)
    - Restores a sense of control through supportive measures that help in relieving physical discomfort and promote mental activity to prevent delirium in high-risk patients (13)
**Conflicting results:** One study found when nursing staff tried to re-orient patients during a delirious episode, that the attempt to guide patients back to reality caused patients to mistrust their experiences and led them to undue stress and further delirium (13)

- Time-orienting devices: clock, calendar (13)
- Address patient by name (13)
- Conveying identifying information by stating their purpose (Mr. Jones, I am your nurse and I’m going to…) (13)
- Frequent verbal reminders of time, day, place (13)
- Glasses & hearing aids (13)
- Dim lights at night (13)
- Minimize noise during both day and night to promote uninterrupted sleep (13)
- Volume control on equipment (13)
- Minimize conversation among staff at bedside (13)
- Effective communication: slow-paced, concise, repetitive (13)
- Avoiding terminology unfamiliar to the patient (13)
- Displaying family photos or familiar possessions from home (13)
- Encouragement of family visits (13)
- Adequate pain relief (13)

**Validation Therapy:** Acknowledgement that patient’s feelings are real to them (13)

- May be an effective approach when dealing with confused, aggressive, older patients (13)
- Key is to listen to what patients are trying to tell staff, trust stories (even if fanciful) and interact with them in a way that maintains their dignity and integrity (13)
- Nurses meet patients’ interpersonal needs and psychological needs with sensitivity via confirmation, reassurance, and support of patient narrative during delirium period (13)
- “Validates” an experience as real, without confirming that it exists in the real world (13)
- Do not re-orient to the here and now; emphasize supporting and endorsing patient’s current confusional experience (13)
- Nursing staff should not scold the patient or make humorous remarks causing embarrassment or make them feel disgraced, which could result in a threatening experience that increases their suffering (13)

### Delirium Management Interventions (2,3,4,5,6,7,9,10)

- Delirium is a medical emergency - key steps in management are to address all evident predisposing and precipitating factors promptly, provide supportive care, prevent complications, and treat behavioral symptoms (4)
  - **Supportive care:** (4)
    - Protect airway (4)
    - Maintain hydration and nutrition (4)
    - Position (4)
    - Mobilize patient (4)
    - Avoid physical restraints (4)
    - Support daily care needs (4)
  - **Delirium Specific Interventions.** (3)
    - **Delirium Room (DR):** a four-bed patient room (within an Acute Care for Elders [ACE] Unit) (3)
      - Provides 24-hour nursing care (3) (See Flaherty & Little [2011] for Comparison of Traditional vs. Delirium Room Strategies; See Flaherty & Little [2011] for Physical Design of the Delirium Room)
      - All patients are visible to nursing staff in the room while curtains maintain privacy (3)
      - DR is closest room to main nursing station so that more help is close by if needed (3)
      - Empowers nurses to make decisions about safety for patient with or at risk for delirium and at risk of falling (3)
      - DR lessens the need for one-on-one sitters and use of physical restraints, as well as lower fall risk and better behavioral management of patients with delirium and dementia (3)
      - Emphasizes nonpharmacological approaches via T-ADA method (3)
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- Core principles and Golden Rule of “tolerate, anticipate, and don’t agitate” (3)
  - Completely free of physical restraints (3)
  - Staffing Ratios: One CNA for DR, one RN for DR, with 2 or 3 additional patients on ACE (3)

- Admission Criteria (3)
  - Requirement for a higher level of observation and intensity of service (3)
  - Need for frequent observation for acute delirium and redirection of behavior (3)
  - Evaluation of patients on suicide watch and drug or detoxification patients on a patient need basis (3)

- Nurse driven delirium management model (3)
  - Uses expert nursing judgment to customize individualized care (3)
    - Decisions cannot be systematized or put into a protocol (3)
  - Negative outcomes associated with delirium, such as loss of function, longer hospital stay, and greater mortality, can be decreased to levels seen in individuals without delirium (3)
  - Commitment from administration and nursing is important in establishing a ACE unit and DR (3)
  - Led to positive nursing leadership changes (3)
  - Charge nurse primarily makes decisions about who is admitted to DR, with input from the nurse manager if necessary (3)
  - Physicians can request patient be in DR (3)
  - Disagreements between providers resolved by consensus (3)

- Patient Specific Nonpharmacologic Approaches: (3,4,6,7)
  - Create a calm, comfortable environment (4)
  - Orienting influences, such as calendars, clocks, and familiar objects from home (4)
  - Regular and frequent reorienting communication with staff members (4,7)
  - Reminiscence by nurses resulted in a period of reorientation in confused patients (6)
    - Family members were taught to use reminiscence to help prevent AC (6)
  - Involve family members in supportive care (4)
  - Limit room and staff changes (4)
  - Coordinate schedules for administering drugs (4)
  - Obtain vital signs (4)
  - Perform procedures to allow uninterrupted periods for sleep at night with low levels of noise and lighting (4)
  - Encourage normal sleep–wake cycles by open blinds and encourage wakefulness (4)
  - Early mobilization during daytime (4,7)
  - Adequate nutrition (7)
  - Adequate hydration (7)
  - Regular use of sensory aids such as glasses and hearing aids (7)
  - Pain should be aggressively identified and appropriately treated (7)
    - Adequate treatment of pain in the elderly can improve functional status, mobility, and mood (7)
    - Undertreatment of pain in hospitalized patient is common and can lead to delirium, delays in rehabilitation, and higher healthcare costs (7)
  - Physical restraints should be avoided in delirious patients, as they may actually worsen delirium and have not been proven to reduce falls or secondary injury (7)

- Patient Specific Pharmacologic Approaches: (4,9)
  - Reserved for patients whose symptoms of delirium would threaten their own safety or the safety of other persons or would result in the interruption of essential therapy (4)

- Multidisciplinary/Interdisciplinary Interventions (5,6)
  - Pharmacist involvement was essential in reduction/substitution of medications known to cause AC (6)
  - Multidisciplinary collaboration and interdisciplinary interventions, combined with evidence-based protocols, education, and nutritional supplementation, can potentially reduce the incidence and shorten the duration of delirium and improve outcomes for patients (5,6)
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- **Multifactorial/Multimodal Interventions** (4,7,9)
  - Geriatric syndromes cannot be treated easily with a single intervention; the approach must target each modifiable risk factor (7)
    - 2 geriatric syndromes, delirium and falls, are associated with increased length of stay, increased healthcare costs, and substantial morbidity (7)
  - Multifactorial interventions such as the Hospital Elder Life Project (HELP) have been shown to increase staff awareness to prevent delirium and falls, and shorten the patient’s LOS (4,7,9)

- **Medication Review and Treatment** (3,4,7,10)
  - Interventions focusing on adverse drug effects have the greatest potential for preventing delirium (9)
  - **Beers Criteria**: (2,7) 53 medications or medication classes of drugs, divided into several tables listing rationale, recommendations, quality of the evidence, and strength of recommendation (2) (Tables available at: [http://www.americangeriatrics.org/files/documents/beers/2012AGSBeersCriteriaCitations.pdf](http://www.americangeriatrics.org/files/documents/beers/2012AGSBeersCriteriaCitations.pdf)) (2)
    - Provides expert consensus on drugs that should either be avoided or used cautiously in the elderly (2,7)
    - Guideline for identifying medication for which the risk of their use in older adults outweigh the benefits (2)
    - Prescribing and managing disease conditions should be individualized and involve shared decision-making (2)
    - Not meant to supersede clinical judgment or an individual patient’s values and needs (2)
  - Thorough review and reduction of all preadmission and current medications in collaboration with the patient’s primary care provider (4,7)
    - Even long-standing medications can contribute to delirium (7)
  - **Technology** (10)
    - A computer-based system to advise doctors on contraindications and reduced doses in older patients at the point of prescription of neuroleptics and sedatives in a United States hospital demonstrated significant improvements in prescribing safety and quality and reductions in prescriptions (10)
    - Fall rates for patients in the intervention group were significantly lower (2.8 vs 6.4 falls per 1000 OBDs, P<.001) (10)
  - **Pharmacologic Treatment**: (7) **NOTE**: Reserved for patients whose symptoms of delirium would threaten their own safety or the safety of other persons or would result in the interruption of essential therapy (4)
    - Low-dose haloperidol is the first-line agent for pharmacologic treatment of delirium in the acute setting (7)
    - Second-generation antipsychotics are an alternative, but studies have shown no benefits of these agents over haloperidol in terms of safety or efficacy (7)

- **Delirium Prevention & Management Education** (6,9,14)
  - Staff development programs should include strategies to reduce potential environmental hazards and also demonstrate techniques to cope with wandering, restless or agitated patients, without over stimulating the confusion (14)
  - **Staff Education** (6,9,14)
    - All health care staff must be given appropriate training and development to recognize and modify risk factors and to effectively communicate and document information (14)
    - Education of the nursing staff is integral in the implementation process of a delirium program (6,9)
      - Development of protocol self-learning packets (6)
      - Monthly discussion (6)
      - Education at nurse meeting (6)
      - Education at new hire orientation (6)
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- Change attitudes of inevitability and negative attitudes among staff regarding falls happening to confused older people (14)
- Case studies using reflection is essential (6)
  - Greater staff awareness (14)
  - Recognition of delirium (9)
  - Documentation of delirium (9)
  - Use of assessment tools in high-risk patient groups (9)

➤ Delirium Risk Assessment Tools and Tests (1,4,5,7,8,13)

- **Assessment (4,7,8,13)**
  - Every older hospitalized patient should undergo early, brief, formal and regular systematic cognitive assessment screenings and physical functioning with standardized instruments as a routine part of multidisciplinary team assessment to identify alteration from a patient’s baseline cognitive status, detect deviations during hospitalization, preserve function, and treat delirium before it has deleterious effects resulting in adverse events (4,7,8,13)
    - Determining the acuity of the change in mental status is the essential first step (4)
    - Neglecting this step is leading reason for missing delirium diagnosis (4)
    - If no history available, delirium is diagnosis until proven otherwise (4)

- **Reassessment (4,13)**
  - Older patients should be aroused during rounds and evaluated daily for hypoactive delirium (often overlooked) (4)
  - Health care professional do not routinely assess for cognitive decline in hospitalized patients, as their main concern is the management of the patient’s primary medical problem (13)

- **Instruments (1,5,7,8,9,12,13)**
  - **NOTE:** Delirium Rating Scale, Delirium Index, Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), and the NEECHEM Confusion Scale are problematic (13)
    - Do not assess all the key features of delirium (13)
    - Have relatively low sensitivity and/or specificity (13)
    - Require information from many different sources that can only be interpreted by a skilled clinician (13)
  - **Barthel Index** is scored by a close relative or caregiver seeing patient at least once every 14 days before hospitalization. Score of 19 or 20 out of 20 considered indicative of functional independence in activities of daily living (5)
  - **Confusion Assessment Method (CAM)** is the most widely used bedside screening instrument by non-psychiatrists for detecting delirium (7,8,9,13)
    - Remains the most suitable test to check for presence of delirium via best combination of ease, speed of use, data acquisition, reliability, and validity (1,12,13)
    - Psychometric properties consistently outperforms the above tools under **NOTE** (13)
    - Combinations of other validated instruments (Delirium Rating Scale, Delirium Index, Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE), and the NEECHEM Confusion Scale) measuring delirium did not yield substantial improvements in performance over the CAM tool (13)
    - Originating from operationalized criteria set by DSM-IV; devised by expert panel using consensus-building process (13)
  - One 2009 study demonstrated interrater agreement assessment of CAM in random subsamples of 13 and 15 patients, both showing kappa values of 1.0 (5)
  - **Delirium Index** (McCuster, Cole, Bellavance, & Primeau, 1998) (13) (No description of tool)
  - **Delirium Observation Screening (DOS) scale** (11): Easy-to-use observation scale designed to aid nurses in their observations (12)
    - Based on DSM-IV criteria for delirium, literature review, clinical experience, and expert opinion (12)
    - Scale completion takes a few minutes (12)
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- High internal consistency (Cronbach’s alpha, 0.96) and good predictive validity against a DSM-IV diagnosis (p < .001) (12)
  - Delirium Rating Scale (Trzepacz, Baker, & Greenhouse, 1988) (13) (No description of tool)
  - Delirium Writing: as the MMSE can't distinguish delirium from dementia (13) (No description of tool)
  - DSM-IV diagnostic criteria: Assessment Gold Standard (13)
  - Informant Questionnaire on Cognitive Decline in the Elderly Short Form (IQCODE-SF): 16-item instrument developed to acquire proxy (family/caregiver) information on the patient’s performance in daily tasks that require memory (5,12,13)
    - Determines pre-existing cognitive impairment (12)
    - Reliable and valid instrument (12)
      - Cronbach’s alpha = 0.95 (12)
      - Test-retest reliability in a dementing sample was good (r = 0.75) (12)
      - All items differentiated between a general population and dementing samples (12)
    - Advantages over other instruments: (12)
      - Education, pre-morbid intelligence, or cultural differences do not influence ratings on the IQCODE (12)
      - No influence of admission stress, postoperative situation, or possible symptoms of delirium (12)
  - Mini-Cog Screening Tool (7)
    - Only 2 to 4 minutes to administer (7)
    - Sensitivity of 76% and specificity of 89% [similar to the Mini-Mental State Examination (MMSE) (7)
    - Validated in a multiethnic, multilingual sample with low literacy (7)
    - Not been studied extensively in the inpatient setting, but one study did find that abnormal Mini-Cog scores correlated with the development of delirium among hospitalized elderly patients (7)
  - Mini-Mental State Examination (MMSE), widely known but limited by copyright for clinical use and longer time needed for administration (1,7,8)
    - Cannot distinguish delirium from dementia (1)
  - NEECHAM Confusion Scale: (Neelon, Champagne, McConnel, Carlson, & Funk, 1992; Neelon, Champagne, Carlson, & Funk, 1996; Miller et al., 1997) (12,13)
    - Easy-to-use observation scales such as the NEECHAM Confusion Scale can aid nurses in their observations (12)
  - Predictive Screening Model (relatively modest specificity is not problematic if used for screening only): A simple predictive model (X2 p = .004) derived by adding one point to each of the significant predisposing factors (a Barthel Index <17, a psychiatric diagnosis, four or more comorbid problems) (12)
    - Cutoff score of 1 gives a sensitivity of 89% and a specificity of 47% (12)
  - Short Portable Mental Status Questionnaire (SPMSQ): Entirely verbal and does not require that the patient write or draw (7)
    - “Sweet 16” (new tool): Entirely verbal and takes about 2 minutes to administer, shows promise but has not been validated in the inpatient setting (7)

- Delirium Etiology & Risk Factor Characteristics (1,3,4,5,7,8,9,10,12,13,14)
  - Etiology is multifactorial: a complex interrelationship between a vulnerable patient with predisposing factors and exposure to precipitating factors or noxious insults (4)
    - Addressing just one contributing factor is unlikely to resolve delirium in an older person; should all be addressed when possible (4)
  - Inouye's Model Of Cumulative Effects Of Baseline Vulnerability Factors And Precipitating Factors For Delirium: (1,4,12)
    - Baseline vulnerability factors are the predisposing factors for delirium present upon admission (1,4)
    - Precipitating factors are the noxious insults or hospitalization-related factors that contribute to delirium (1,4)
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- Patients with high baseline vulnerability to delirium may develop delirium with any precipitating factor, even one of mild degree (4,12)
- Patients with low vulnerability may be resistant to delirium even with harmful insults (4,12)

- VINDICATE: Delirium risk factors identified in the literature summarized by the word "VINDICATE" (1)
  - Vascular, Infections, Nutrition, Drugs, Injury, Cardiac, Autoimmune, Tumors, and Endocrine (1)

- Extrinsic Risk Factors (3,4,5,7,9,12)
  - Drugs (4,7)
    - Alcohol abuse (3,4,7)
    - Sedative hypnotics (4)
    - Narcotics (4)
    - Treatment with single or multiple psychoactive or anticholinergic medication such as diphenhydramine, benzodiazepines, and muscle relaxants (3,4,7)
      - Opioids and for benzodiazepines or other sedatives accounted for 21.3% and 15.2% of drug-induced delirium hospitalizations (1998 to 2005 U.S. Inpatient Hospitalization Data analysis) (9)
  - Polypharmacy (4,7,9,13)
  - Decreased Oral Intake (4,13)
  - Dehydration (4,13)
  - Malnutrition (4,13)
  - Non-dementia non-drug volume depletion and sodium imbalance had the strongest, although modest, associations with delirium (1998 to 2005 U.S. Inpatient Hospitalization Data analysis) (9)
  - Low BMI (underweight) (5)
    - Independent risk factor for postoperative delirium in hip fracture patients (5)
    - BMI < 20.0 kg/m2 increased odds of delirium by a factor of almost 3
      - Indicates a risk increase equivalent to that associated with prefracture cognitive impairment and an indoor injury (5)
      - Accords well with intervention studies indicating that malnutrition is significantly associated with preoperative and postoperative delirium (5)
  - Cognitive impairment and indoor injury are independent risk factors for preoperative and postoperative delirium (5)
  - Time from admission to operation is a risk factor for preoperative delirium (5,12)
  - Non-dementia non-drug co-morbid conditions, volume depletion and sodium imbalance, had the strongest, although modest, associations with delirium (1998 to 2005 U.S. Inpatient Hospitalization Data analysis) (9)

- Intrinsic Risk Factors (4,7,10,12) **Conflicting Evidence
  - Age 65 years or older (4,7,12)
    - Association between decade of age and delirium was strongest for NDND delirium (adjusted odds ratio 1.53; 95% CI 1.52, 1.53) (1998 to 2005 U.S. Inpatient Hospitalization Data analysis) (9)
      - Strongly supports the concept that increasing age predisposes to any delirium (9)
      - Past 5-10 years US statistics identify a notable increase in incidence of delirium for hospital patients age 80 and > (1990 to 2005 literature) (13)
      - Age also had significant associations with drug-induced and dementia-associated delirium (9)
  - **Male (4) versus Female (12)
    - Significantly associated with delirium, particularly drug induced delirium (9)
    - African Americans may be more likely to be coded as having psychosis in the context of delirium (9)
  - Cognitive Status (4,7,13)
    - Prior delirium or dementia (4,7,13)
    - Depression (4)
    - Cognitive impairment (4,14)
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- Not uncommon to find cognitively impaired patients experiencing multiple falls (14)
- Fall twice as often as cognitively normal patients (14)
  - Functional Status (4,7,13)
    - Functional dependence (4,7)
    - Immobility (4)
    - Low level of activity (4)
    - History of Falls (4)
  - Sensory impairment (4,7,13)
    - Visual Impairment (4)
    - Hearing Impairment (4)
  - Contributing Factors: (4,5,7,9) Limited preventative effect may be achieved by addressing co-morbidities (9)
    - Non-dementia non-drug co-morbid conditions had the strongest, although modest, associations with delirium (1998 to 2005 U.S. Inpatient Hospitalization Data analysis) (9)
    - Often sole manifestation of serious underlying disease (4)
    - Common co-morbid conditions such as atrial fibrillation, diabetes and anemia, had no or minimal associations with delirium (9)
    - Infections such urinary tract infections, respiratory infections, hospital-acquired pneumonia, HIV (4,7,13)
    - Pain (4,7)
    - Cardiac ischemia (4,7)
    - Respiratory failure (4)
    - Anemia (4)
    - Fever (4)
    - Hypothermia (4)
    - Urinary retention or constipation (7)
    - Bladder catheter (4)
    - Physical restraints (4,13)
    - Chronic renal disease (4)
    - Chronic hepatic disease (4)
    - Neurologic disease (4)
      - Stroke (4,13), particularly nondominant hemispheric (4)
      - Intracranial bleeding (4)
      - Meningitis or encephalitis (4)
      - Cerebrovascular disease (9)
    - Metabolic derangements and electrolyte abnormalities (4,7,10)
    - Fracture or trauma (4,5,12,14)
      - Post-operative confusion can occur in older people following hip fracture and often caused by delirium (14)
      - Elderly hip fracture patients with premorbid ADL dependency, psychiatric comorbidities (including dementia), and a high number of other comorbid problems are at risk for the development of delirium (12)
- Predisposing Factors (12)
  - Age: mean 82.7 years (12)
  - Gender: 87% female (12)
  - Sensory impairments (12)
  - Functional impairment before the hip fracture (12)
  - Residency before admission (12)
  - Pre-existing cognitive impairment (12)
  - Comorbidities (12)
  - Medication use (12)
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- **Precipitating Factors** (5,12)
  - Time from admission to operation is a risk factor for preoperative delirium (5): 43% who waited over 48 hours before surgery developed delirium (12)
    - Sudden acute or severe illness (4)
    - Terminal illness (4)
    - Shock (4)
    - Multiple coexisting conditions (4)
    - Prolonged sleep deprivations (4,13)
    - Emotional stress (4)
    - Iatrogenic complications (4)
      - Multiple medical procedures (4)
    - Admission to intensive care unit (4)
    - Surgery (4,5,9,12)
      - Orthopedic surgery (4)
      - Cardiac surgery (4)
      - Prolonged cardiopulmonary bypass (4)
      - Noncardiac surgery (4)
      - Drug-induced delirium and NDND delirium had the strongest associations with lower extremity orthopedic surgery hospitalizations and urinary tract/kidney infection hospitalizations in the United States from 1998 to 2005 (9)
    - Time from admission to operation is a risk factor for preoperative delirium (5): 43% who waited over 48 hours before surgery developed delirium (12)

- **Falls** (3,4,7,8,10,14) (See Appendix B, Page 24, Falls Prevention/Prevention of Harm from Falls Integrative Review, 2010)
  - Components of successful programs for reducing the likelihood of delirium have much in common with the more successful multifactorial and single fall prevention interventions described, and therefore might be expected to reduce falls (10)
  - **Fall Screen:** “Have you fallen in the past year?” with more detailed inquiry for frequent fallers (1)
    - Interventions that target multiple risk factors appear to be effective in reducing risk and rate of falling (7)
  - **Fall Risk Assessment** (8,14)
    - Few hospital fall risk assessment tools have been tested in clinical trials; unclear if they actually reduce number of falls (14)
    - Individualize clinical assessments to identify symptoms of delirium that may impede a patient’s ability to follow a fall prevention program (8)
    - Use a systematic approach to assessment in order to recognize patient confusion and individual risk factors for falls (8)
      - Cognitive impairment (4,14)
        - Not uncommon to find cognitively impaired patients experiencing multiple falls (14)
        - Fall twice as often as cognitively normal patients (14)
  - **Falls Prevention and Management:** (3,8,10,14)
    - Preventing and managing delirium remains a clinical imperative even if the effect on fall prevention is not yet empirically proven, given the associations between this condition and increased morbidity and mortality (10)
      - One of the most important risk factors for falling may be delirium (8,13)
    - Limited data suggested that the rate of falls is at least not higher in a Delirium Room than in the Acute Care for Elders unit overall (3)
    - Prevent falls in hospital by focusing on staff development and promoting a safe environment (14)
      - Strategies to improve the safety of confused patients on hospital wards will not be affective unless all health care staff are given appropriate training and development to recognize and modify risk factors and to effectively communicate and document information (14)
Components of successful programs for reducing the likelihood of delirium have much in common with the more successful multifactorial and single fall prevention interventions described, and therefore might be expected to reduce falls (10)

- Delirium avoidance programs have only informally reported reductions in falls, although one successful multifactorial fall prevention study also reported as achieving significant reductions in delirium (10)

Specific Strategies/Interventions with Fall Precautions when a patient is identified as having delirium (8,14)

- Regular mental status assessments using communication techniques (8)
  - Reorient to person, place, time (8)
  - Speak slowly & clearly (8)
  - Use simple one step directions (8)
- Use sensory aids (glasses, hearing aids, dentures) (8)
- Mindful of sleep hygiene (open blinds, turn on lights during day; darken room at night) (8)
- Monitor nutrition (8)
- Comfort measures for pain, mobilization, ambulation (8)
- Monitor physiological care (8)
- Consistent daily routine & schedule (8)
- Patients usually display a pattern to their falls, which the family may be able to identify (14)
- Maintain a continuous record of dates, times and circumstances of the fall for recognition of fall patterns and implementation of appropriate strategies (14)
- Clearly identify patient’s individual fall risk factors on care plans and state how each risk factor should be reduced or modified (14)
- Pass on all information to staff during ward reports and multidisciplinary team meetings, and most importantly on transfer to other wards or discharge (14)
  - Valuable information gained by the staff is often not passed on to the new carers when patient leave the ward (14)

Data Collection & Analysis (1,3,4,7,9,13)

- Data Collection and Analysis Tools (9)
  - Administrative hospitalization databases constitute a resource to explore factors and trends associated with delirium, such as the upward trending of drug-induced delirium, for developing strategies for preventing delirium (9)
  - Prevalence underestimation is common in administrative database reports (9)
  - May be greater reliability in symptomatic condition coding than in non-symptomatic condition coding (9)

- Delirium Outcome Measures (1,3,4,7,13)
  - Morbidity: (4,7)
    - Marker for significant morbidity (7); 10 to 30 % of older patients in EDs, delirium is a symptom often heralds presence of life-threatening conditions (4)
  - Mortality: (3,4,7) **Conflicting Evidence
    - Marker for significant mortality (7)
    - **One study on the use of a Delirium Room found no differences in mortality between patients with and without delirium (3)
    - Mortality rates among hospitalized patients with delirium from 22 to 76% (4)
      - One-year mortality rate associated with cases of delirium is 35 to 40% (4)
  - Discharge to Skilled Nursing Facility (7)
    - Increases likelihood of discharge to a skilled nursing facility (7)
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- **Length of Stay:** (1,3,4,7,13) **Conflicting Evidence**
  - Predicts longer LOS (7)
  - **One study on the use of a Delirium Room found no differences in LOS between patients with and without delirium (3)**
  - Care of delirium patients accounts for > 49 percent of all hospital days (4)
  - Complicates hospital stays for more than 2.3 million older people and involves more than 17.5 million inpatients days (1)
    - Complicates hospital stays for at least 20 percent of the 12.5 million hospitalized patients >65 yrs annually (4)

- **Delirium Rates:** (4,7,9,13)
  - **Prevalence:** (4,9,13)
    - Overall prevalence of in the community is only 1 to 2 percent (4)
    - Prevalence increases with age, rising to 14 percent % those > 85 years old (4)
    - Prevalence for all general hospital admissions from 14 to 24% (4,13)
    - Overall prevalence of dementia-associated delirium and NDND delirium decreased over time from 1998 to 2005 in U.S. inpatient hospitalizations (9)
    - Overall prevalence of drug-induced delirium prevalence increased (p < 0.0001) from 1998 to 2005 in U.S. inpatient hospitalizations (9)
  - **Incidence:** (4,7,13)
    - As high as 60% in hospitalized elderly patients (7)
    - Incidence during hospitalization ranges from 6 to 56 % among general hospital populations (4)
      - 10-30% of patients become delirious post-admission (13)
      - 15 to 53 % of older patients postoperatively (4)
      - 70 to 87 % of patients in intensive care (4)

- **Coding:** (9)
  - Coding can vary whether Diagnostic and Statistical Manual (DSM) or ICD schema are used (9)
  - There is an impression that ICD-9 coding underestimates the prevalence of delirium in hospitalized patients (9)
    - Dependent on clinician recognition and documentation (9)
  - Delirium definition of delirium varies according to criteria utilized (9)
  - ICD-9 codes do not include diagnoses describing disorganized thinking, alteration of consciousness, cognitive defects, perceptual disturbances, etc. (9)

- **Cost:** (1,3,4,9,11,13)
  - Delirium prevention is a feasible and cost effective health strategy (11)
  - Delirium has definable hospital costs and could affect healthcare economics through the use of staff education in (a) recognition of delirium, (b) documentation of delirium, and (c) the use of assessment tools in high-risk patient groups (9)
  - Total national costs related to preventable adverse events are estimated to be between $17 billion and $29 billion per year; delirium may account for at least a quarter of these costs (4)
  - Delirium complicates hospital stays for more than 1.5 million inpatient days and accounts for more than US $4 billion Medicare expenditures (13)
  - Increases hospital costs by $2,500 per patient; $6.9 billion (value in U.S. dollars in 2004) of Medicare hospital expenditures attributable to delirium (4)
    - Each confused patients costs an average of US $30,000 (13)
    - Each year delirium accounts for more than $4 billion of Medicare expenditure (1)
  - Construction costs of the DR at one hospital were less than $10,000 in 1997 (3)
    - Nursing unit budget costs for the ACE unit with the DR over that of an adult medical unit are one additional full-time equivalent unlicensed assistive personnel (CNA) per day (3)
    - No dramatic increases in nursing unit budget costs (3)
    - Annual 1995 costs of sitters in three general hospitals ranged from $232,000 to $581,000 (3)
Nursing Care Implications (6,8,9,12,13)

- Nurses were integral in developing and implementing evidence-based practices to prevent complications and improve patient outcomes (6).
- Nurses are often the first to recognize subtle behavioral and cognitive changes in patients which, through systematic screening, best positions them for prompt detection of delirium (13).
  - Nurses should be aware of the development of delirium, especially in patients 80 years and older with premorbid psychiatric problems (including cognitive decline) and a high number of other comorbidities (12).

Assessment (9,12,13)

- There has been growth in the use of nursing assessment for improving geriatric care delivery and in recognizing geriatric syndromes such as delirium (9).
  - Easy-to-use observation scales aid nurses in their observations (12).
- Assess patients' pre-fracture functional and cognitive capacities and the number and type of comorbidities soon after hospital admission (12).
  - Physicians tend to heavily rely on nursing observations for mental status changes (13).
- Health care professionals do not routinely assess for cognitive decline in hospitalized patients, as their main concern is the management of the patient's primary medical problem (13).
  - However, neither nurses nor physicians have been proactive for accurate screening for delirium in at-risk patients (13).

Surveillance (13)

- Delirium necessitates increased patient surveillance by nurses, as it can trigger assaultive behaviors that puts nurses, patients, and visitors at risk and places an unnecessary burden on health care system (13).
- Nurses should be alert to postoperative delirium in “healthy elderly” patients (12).
  - Monitoring of symptoms postoperatively in all elderly patients is advised (12).
  - View mental status as the 6th vital sign (8).

Staff Awareness (13)

- Increasing knowledge and awareness of early detection and efficient management of delirium is the first step to prevention (13).

Nursing Research: Present and Future (5,9,10,11,12,13)

- Majority of research papers (1990 to 2005) on delirium have been based on studies conducted in Canada, US, and UK (13).
  - Largely weighted toward older patients (> 65 years old) (13).
- Suggested Future Nursing Research Studies for the topic of Delirium:
  - Underweight and delay to surgery (5).
  - Whether oral nutrition given up to 4 hours before operation or intravenous nutrition, shorter time from admission to operation, and prioritizing patients with cognitive impairment and indoor injury can prevent delirium (5).
  - Clinical effectiveness of multicomponent interventions and the cost to the National Health Service of implementing a multicomponent prevention intervention, compared with the care that persons in a hospital setting currently receive (11).
  - Whether an education program for staff would reduce the incidence of delirium and improve the recording of delirium for patients in the hospital compared with an education leaflet or usual care (11).
  - Compare chart documentation by providers in routine clinical care, ICD-9 coding, and diagnosis by a standardized assessment (9).
  - Effects of combined risk assessment, preventive interventions, and monitoring of symptoms (12).
  - Factors in the nursing practice environment that may precipitate delirium (12).
  - Use IQCODE in combination with a test for cognitive status to explore the issue of missing value on the IQCODE (12).
  - Precipitating factors, such as malnutrition and dehydration, and the use of direct measures (12).
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References


## Electronic Database Search Methodology

Integrative review search topic: “What is the quantity, quality, and consistency for effective interventions to prevent falls with injury for adult medical/surgical patients at high risk of delirium?”

**Date(s): June 2012**

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**TOTALS**: 681,834  27  4  23  12  11
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Total Articles Included in Literature Review: Database (11) + Contextual Links (3) = 14

Inclusion Criteria: Delirium, Med/Surg, acute care setting, adults from 18 or older, 2000-2012 (secondary information: fall with injury interventions, fall with injury risk factors, delirium assessment tools)

Exclusion Criteria: ETOH withdrawal delirium, ER, SNF, long term care, ICU, pediatrics, inpatient rehabilitation units,

P: adult inpatients in the acute care med/surg setting
I: effective interventions to prevent and manage delirium in patients at high risk of falls with injury
C: current standard of care
O: prevention of falls and falls with injury
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Quality of the Evidence

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<td>C</td>
<td>Qualitative studies, descriptive or correlational studies, integrative reviews, systematic reviews, or randomized controlled trials with inconsistent results</td>
<td>2</td>
<td>#8, #9</td>
</tr>
<tr>
<td>D</td>
<td>Peer-reviewed professional organizational standards, with clinical studies to support recommendations</td>
<td>3</td>
<td>#2, #6, #11</td>
</tr>
<tr>
<td>E</td>
<td>Theory-based evidence from expert opinion or multiple case reports, case studies, consensus of experts, and literature reviews</td>
<td>7</td>
<td>#1, #3, #4, #7, #10, #13, #14</td>
</tr>
<tr>
<td>MA</td>
<td>Manufacturer’s recommendation; Anecdotes</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>14</strong></td>
<td></td>
</tr>
</tbody>
</table>

* A large sample has adequate power to detect the observed effect with confidence (as seen in significant Confidence Intervals). A small sample may lack confidence in the power of the desired effect (Polit & Beck, 2008)

Created by E. Cuenca, RN, MSN, CNS & C. Crawford, RN, DNP; Collaborative Center for Integrative Reviews & Evidence Summaries (CCIRES) KP SCAL Regional Nursing Research Program, May 2010

CCIRES Strength of Recommendation Taxonomy (SORT) for Grading the Evidence

Evidence graded as “Good” (1) = 2 articles
Evidence graded as “Fair” (2) = 2 articles
Evidence graded as Insufficient (3) = 10 articles

Summary of the Strength of the Body of Evidence

3 = Insufficient

The summary of the body of the evidence based on consensus, usual practice, opinion, disease-oriented evidence* and demonstrates good quality patient-oriented evidence*, case series, and case studies

*Patient-oriented evidence measures outcomes that matter to patients: morbidity, mortality, symptom improvement, cost reduction, quality of life.
#Disease oriented evidence measures intermediate, physiologic, or surrogate endpoints that may or may not reflect improvements in patient outcomes (i.e. blood pressure, blood chemistry, physiological function, and pathological findings)
Appendix A

Delirium Prevention & Management Model:
An Evidence-Based Framework for Risk Reduction & Risk Management*

*For Falls specific prevention and management, see Falls Prevention/Prevention of Harm from Falls Integrative Review and Model, 2010
Delirium Prevention and Management Programmatic Model

Start at the bottom of the programmatic model and move upwards. Appropriate references are cited for each section.

1. **DESIGN:** This section forms the organizational foundation necessary for the development of the Delirium Model. Specific elements for Interdisciplinary Collaboration and MultiModal Delirium & Falls Program components are highlighted. Systems components of assessment, implementation, monitoring, and evaluation are contained within the Quality Improvement and Risk Management infrastructure.

2. **PREVENTION:** Prevention is a key section of the Delirium Model, which involves nursing and other staff members as appropriate. Specific components and elements appropriate to the model include Risk Identification & Assessment, Communication, Documentation, Cost, Reporting Systems, Environmental, Education, and Interventions/Strategies.

3. **RESCUE:** The third section of the Delirium Model summarizes the rescue measures needed to reduce risk and involves nursing and other staff members as appropriate.

4. **PROTECTION:** The last section of the Delirium Model focuses on protection and safety mechanisms. The components needed to ensure protection processes are in place, as seen by Initial Response, Safety, and Disclosure. Note feedback loops to previous sections involving assessment, surveillance, pharmacology, sensory aids, communication, and family involvement.
Appendix B
Falls Awareness & Prevention Model:
An Evidence-Based Framework for Risk Reduction & Management

Adapted from Sentara’s Falls Reduction Conceptual Framework: An Error Management Model (2008); C. Crawford, RN, MSN; Kaiser Permanente SCAL Regional Nursing Research Program, March 2011
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