

11-11-2016

# Models for Predicting Incident Delirium in Hospitalized Older Adults: A Systematic Review

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## Recommended Citation

Kalimisetty S, Askar W, Fay B, Khan A. Models for predicting incident delirium in hospitalized older adults: a systematic review. *J Patient Cent Res Rev.* 2016;3:237-8.

The mission of the Journal of Patient-Centered Research and Reviews (JPCRR) is to further the ongoing quest for new knowledge by providing a medium for the communication of clinical research, with the purpose of improving the quality of human health, the care of the individual patient, and the care of populations.

**Results:** In patients with LVEF > 40%, the 1-, 6- and 12-month mortality rates were 3.8%, 9.0% and 12.1%, respectively. In patients with LVEF ≤ 40%, 1-, 6- and 12-month mortality was 9.5%, 18.4% and 25.2%, significantly greater than patients with LVEF > 40% at all time points (P<0.01). Univariate analysis of patients with LVEF ≤ 40% found the following echocardiographic parameters to be significant predictors of 6-month mortality: right atrial pressure, pulmonary artery systolic pressure, LVEF < 25%, mitral A-wave velocity, mitral E-wave deceleration time, and left ventricular posterior wall diastolic thickness. Multivariate analysis identified mitral A-point velocity (hazard ratio [HR]: 0.98, P=0.02), LVEF < 25% (HR: 3.48, P<0.01), glomerular filtration rate (HR: 0.71 at 10-unit increments, P<0.01) and colectomy (HR=5.47, P<0.01) as significant predictors of 6-month mortality.

**Conclusion:** Preoperative LVEF < 25%, lower mitral A velocity, colectomy, and lower glomerular filtration rate are associated with 6-month mortality postsurgery. Close preoperative cardiac assessment of patients with decreased LVEF prior to noncardiac surgery may prove beneficial in improving long-term outcomes.

## **SECOND PLACE POSTER (tie)**

See page 245 for citation.

## **THIRD PLACE POSTER**

See page 245 for citation.

## **SELECT ABSTRACTS**

### **Association Between Pregnancy Intention and Maternal Characteristics, Outcomes, and Cost of Care: A Pilot Study**

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**Background:** An estimated 51% of pregnancies in the United States are unintended. In Wisconsin, unplanned pregnancies account for 40% of all pregnancies and cost \$148 million in public funds. Unintended pregnancy, which creates increased hardship for mothers and threatened well-being of infants, has been recognized as an important health, social and economic problem.

**Purpose:** To determine the pregnancy intentions of postpartum women and the maternal characteristics, outcomes and costs of care associated with unintended pregnancies at a large urban hospital in Milwaukee, Wisconsin.

**Methods:** Postpartum women were surveyed prior to discharge. The 20-item survey included whether or not the woman had been trying to get pregnant and how she felt about the timing of her pregnancy. Electronic medical records were reviewed to determine maternal and neonatal outcomes, including antenatal,

perinatal, postpartum comorbidities and complications. To determine the most important factors influencing the binary and multicategory responses of pregnancy intention, logistic and multinomial regression models were developed using stepwise variable selection procedures.

**Results:** A total of 338 women were asked to participate, resulting in 243 completed surveys (95 exclusions: 8 declines, 29 language barriers, 46 lost to follow-up, 12 other). Overall, 63% (142/227) of pregnancies occurred when “not trying.” Logistic and multinomial regression revealed anemia (P=0.004–0.007), anxiety (P=0.048) and income level (P=0.002–0.045) as the most significant predictors of unintended pregnancy. The odds of unintended pregnancy for women at the lowest two income levels were 12.05 (odds ratio: 2.82–51.39) and 3.83 (odds ratio: 1.314–11.142) times greater than those for women at the highest income level. Significant univariate associations existed between unintended pregnancy and age (P<0.001), race (P=0.025) and insurance (P=0.003).

**Conclusion:** The unintended pregnancy rate of our study population was greater than state and national levels. Maternal characteristics of income, anemia and anxiety were the most significant predictors of pregnancy intention, but unintended pregnancy also was highly associated with younger age, African-American race and Medicaid insurance. Unintended pregnancy effects included: fewer prenatal care visits, increased prevalence of intrauterine growth restriction and decreased likelihood of breastfeeding. While the relative use of contraception was significantly greater, the absolute use among women who had an unintended pregnancy is of great clinical concern.

### **Models for Predicting Incident Delirium in Hospitalized Older Adults: A Systematic Review**

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**Background:** Delirium is common in hospitalized older adults, and 40% of cases may be preventable. Hospital Elder Life Program is an evidence-based program to reduce incidence of delirium. It has been successfully implemented in one hospital and will be implemented in four other hospitals. Identification of patients at highest risk of developing delirium using the electronic health record (EHR) may be an effective targeted strategy to reduce the incidence of delirium.

**Purpose:** To systematically review and summarize the medical literature regarding risk prediction models for delirium in older inpatients.

**Methods:** A medical librarian customized and conducted the search strategy for all published medical articles on delirium prediction models. Electronic databases sourced included Ovid MEDLINE, CINAHL, Cochrane Database of Systematic Reviews, EMBASE and PsycINFO. Controlled vocabulary terms specific to database as well as relevant keywords were

used, including variants of delirium, altered mental status, acute confusional state, acute brain syndrome, acute brain failure, metabolic encephalopathy, predict, predictive, prediction, models, modeling, scores, scoring, tests, testing, rules, index and indices. The bibliographies of included studies were examined, and no additional articles were referenced.

**Results:** To appropriately extract data from the 12 studies meeting inclusion criteria, the following parameters were used: study description, study population, delirium assessment method, incidence of delirium, and risk factors for delirium. Quality for cohort studies was assessed using “Newcastle-Ottawa Quality Assessment Scale” ranging from 1 to 9 (1 = poor quality, 9 = high quality). Overall incidence of delirium in the studies ranged from 4% to 26%. Most common risk factors for delirium were dementia, decreased functional status, blood urea nitrogen to creatinine ratio, infection and severe illness. Other variables less common were alcohol, malignancy, history of delirium, older age, medications, physical restraints, malnutrition, admitted from other than home and an iatrogenic event. The quality of studies ranged from 4 to 8.

**Conclusion:** This systematic review summarizes the medical literature on risk prediction models for delirium in hospitalized older patients. We will use this information to develop an EHR-generated delirium risk prediction model to be used by the “Hospital Elder Life Program” to reduce delirium incidence.

### **Mind and Body Training to Improve Functioning and Coping With Chronic Pain: A Pilot Study**

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**Background:** Patients with chronic pain are often crippled by psychological distress, depression and fear. These patients also can develop altered pain perception, with enhanced brain activity in pain-responsive regions and those associated with anxiety/depression. Exercise and meditation can impact pain-reducing brain areas and positively influence pain characteristics.

**Purpose:** To alter pain center activity by reducing the activation of the higher brain and deactivation of the lower brain with somatocognitive and meditative practices, with secondary aim of reducing anxiety/depression and improve overall quality of life.

**Methods:** We conducted a pilot study on mentally competent adult women with stable chronic pain who were resistant to conventional therapies. Our intervention consisted of an initial 8-hour session at which baseline assessments were completed with introduction to mind/body tools (i.e. deep meditation, breath work, etc.). Baseline assessments also included self-assessment using pain rating surveys, the Zung self-rating anxiety and depression scales, the World Health Organization

Quality of Life-BREF instrument, and the Conner-Davidson Resilience Scale. Following the initial session, 1.5-hour-long meetings were held weekly for 8 weeks, followed by biweekly meetings for 8 weeks, then monthly. Mind/body tools were systematically taught and reinforced during meetings. Patients kept a journal detailing their practice. Pain rating surveys were filled out monthly. All other measures were filled out at 3 and 6 months.

**Results:** Participating women (N=5) had mean age of 43.2 years and mean body mass index of 35.8 kg/m<sup>2</sup>. Mean long-acting narcotic (LAN) was 260, 221.6 and 248.2 mg/day at baseline, 3- and 6-month assessments, respectively. Patients did not significantly decrease use of LAN. Additionally, no statistical difference was identified in a patient’s time in pain or pain right now, resilience, anxiety and depression. However, overall quality of life improved significantly at 6-month follow-up (50.0 vs 25.0, P=0.016). Following 6-month assessment, patients were highly satisfied with their experience. All (100%) strongly agreed that the instructors responded well to questions and established good relationships with participants.

**Conclusion:** Intervention resulted in statistically nonsignificant decreased LAN use and reduced anxiety and depression scales, as well as statistically significant improvement in overall quality of life. Data from these patients will continue to be collected at 6-month intervals to see if there are lasting effects or further improvements.

### **Quality Improvement of Procedural Services in Family Medicine Residency Clinics**

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**Background:** Performing common procedures in our family medicine residency clinics is often a difficult and inefficient process. A 2008 Society of Teachers of Family Medicine consensus statement on procedural training found higher job satisfaction and better financial compensation for family practitioners who performed procedures. Patient satisfaction is likely increased when minor procedures are able to be performed by their primary clinician. This would suggest a disconnect between the known benefits of providing procedural services and the ability of our residency clinics to provide those services in an efficient manner.

**Purpose:** To assess clinician and staff comfort with performance of common family medicine procedures and implement an intervention to improve the efficiency of procedure performance in the clinic setting.

**Methods:** Phase 1: Preintervention survey was distributed to physicians, residents and staff at Aurora Health Care’s family medicine residency clinics. Survey evaluated comfort level of providers in performing common procedures and identifying proper equipment needed to perform procedures. Data was compiled in Microsoft Excel; statistical analysis was performed using ordinal logistic and binary regression. Phase