

References: Delirium

REF ID: 94

Level II: Individual experimental study

Topic 1: Risks

Topic 4.3: Management-Medication

Aizawa, K., Kanai, T., Saikawa, Y., Takabayashi, T., Kawano, Y., Miyazawa, N. et al. (2002). A novel approach to the prevention of postoperative delirium in the elderly after gastrointestinal surgery. *Surgery Today*, 32(4), 310-314.

Clinical Trial. Journal Article. Randomized Controlled Trial

PURPOSE: Postoperative delirium (POD) is known to be one of the most critical complications of major operative procedures in elderly patients. Since disorders of the sleep-wake cycle have been reported to be one of the key factors in POD, we attempted to clarify the effectiveness of improving sleep-wake cycle disorders with medication after surgery to prevent POD, by conducting a prospective randomized study of 42 elderly patients who underwent resection of either gastric or colon cancer through an open laparotomy. **METHODS:** The delirium-free protocol (DFP) group was given an intramuscular injection of diazepam at 20:00 h each night, as well as a continuous intravenous infusion of flunitrazepam and pethidine administered over 8 h, for the first three nights postoperatively. Two patients were excluded because of failure to complete the DFP. **RESULTS:** The incidence of POD was 7/20 (35.0%) in the non-DFP group and 1/20 (5.0%) in the DFP group, this difference being significant ($P = 0.023$). Morning lethargy produced by the DFP was observed in 40% of the DFP group; however, no other side effects were seen. **CONCLUSIONS:** These findings indicate that DFP treatment is effective for controlling POD in elderly patients after general surgery and does not appear to be associated with severe complications or side effects. To our knowledge, this is the first report proposing artificial control of the sleep-awake rhythm by medication as a means of preventing POD in elderly patients.

REF ID: 108

Level I: Systematic Reviews

Topic 1: Risks

Birks, J., & Harvey, R. J. (2006). Donepezil for dementia due to alzheimer's disease. *Cochrane Database of*

Systematic Reviews, 1

Systematic Review

Background: Alzheimer's disease is the most common cause of dementia in older people. One of the aims of therapy is to inhibit the breakdown of a chemical neurotransmitter, acetylcholine, by blocking the relevant enzyme. This can be done by a group of chemicals known as cholinesterase inhibitors. Objectives: The objective of this review is to assess whether donepezil improves the well-being of patients with dementia due to Alzheimer's disease. Search strategy: The Cochrane Dementia and Cognitive Improvement Group's Specialized Register was searched using the terms 'donepezil', 'E2020' and 'Aricept' on 12 June 2005. This Register contains up-to-date records of all major health care databases and many ongoing trial databases. Members of the Donepezil Study Group and Eisai Inc were contacted. Selection criteria: All unconfounded, double-blind, randomized controlled trials in which treatment with donepezil was compared with placebo for patients with mild, moderate or severe dementia due to Alzheimer's disease. Data collection and analysis: Data were extracted by one reviewer (JSB), pooled where appropriate and possible, and the pooled treatment effects, or the risks and benefits of treatment estimated. Main results: 23 trials are included, involving 5272 participants. Most trials were of 6 months or less duration in selected patients. Available outcome data cover domains including cognitive function, activities of daily living, behaviour, global clinical state and health care resource costs. For cognition there is a statistically significant improvement for both 5 and 10 mg/day of donepezil at 24 weeks compared with placebo on the ADAS-Cog scale (-2.01 points MD, 95% CI -2.69 to -1.34, $p < 0.00001$); -2.80 points, MD 95% CI -3.74 to -2.10, $p < 0.00001$) and for 10 mg/day donepezil compared with placebo at 52 weeks (1.84 MMSE points, 95% CI, 0.53 to 3.15, $p = 0.006$). The results show some improvement in global clinical state (assessed by a clinician) in people treated with 5 and 10 mg/day of donepezil compared with placebo at 24 weeks for the number of patients showing improvement or no change (OR 2.18, 95% CI 1.53 to 3.11, $p < 0.0001$, OR 2.38, 95% CI 1.78 to 3.19, $p < 0.00001$). Benefits of treatment were also seen on measures of activities of daily living and behaviour, but not on the quality of life score. There were significantly more withdrawals before the end of treatment from the 10 mg/day (but not the 5 mg/day) donepezil group compared with placebo which may have resulted in some overestimation of beneficial changes at 10 mg/day. Benefits on the 10 mg/day dose were marginally larger than on the 5 mg/day dose. Two studies presented results for health resource use, and the associated costs. There were no significant differences between treatment and placebo for any item, the cost of any item, and for the total costs, and total costs including the informal carer costs. A variety of adverse effects

were recorded, with more incidents of nausea, vomiting, diarrhoea, muscle cramps, dizziness, fatigue and anorexia (significant risk associated with treatment) in the 10 mg/day group compared with placebo but very few patients left a trial as a direct result of the intervention. Conclusions: People with mild, moderate or severe dementia due to Alzheimer's disease treated for periods of 12, 24 or 52 weeks with donepezil experienced benefits in cognitive function, activities of daily living and behaviour. Study clinicians rated global clinical state more positively in treated patients, and measured less decline in measures of global disease severity. There is some evidence that use of donepezil is neither more nor less expensive compared with placebo when assessing total health care resource costs. Benefits on the 10 mg/day dose were marginally larger than on the 5 mg/day dose. Taking into consideration the better tolerability of the 5 mg/day donepezil compared with the 10 mg/day dose, together with the lower cost, the lower dose may be the better option. The debate on whether donepezil is effective continues despite the evidence of efficacy from the clinical studies because the treatment effects are small and are not always apparent in practice.

REF ID: 128

Level II: Individual experimental study

Topic 1: Risks

Topic 3: Assessment

Brauer, C., Morrison, R. S., Silberzweig, S. B., & Siu, A. L. (2000 Jun 26). The cause of delirium in patients with hip fracture. *Archives of Internal Medicine*, 160(12), 1856-1860.

Journal Article. Multicenter Study

OBJECTIVES: To ascertain the most common causes of delirium, to establish the initiation and timing of delirium, and to determine the duration of delirium in patients with hip fracture. METHODS: Five hundred seventy-one (88%) of 650 patients with hip fracture admitted to 4 New York City hospitals were prospectively interviewed on a daily basis, 5 days a week, with the Confusion Assessment Method for the presence of delirium. The patients were enrolled within 48 hours of admission. Their medical charts and the data collected by the study staff were reviewed and summarized. Two of us (R.S.M. and A.L.S.) reviewed the case summaries independently and assigned a cause based on a previously developed classification system, estimated the onset of the delirious episode, and determined whether the delirium had cleared, improved, or persisted at discharge. Subsequently, discrepancies in cause, timing of initiation, and mental status on discharge between the 2 physicians reviewers

were discussed until consensus was reached. RESULTS: The prevalence of delirium was 9.5% (54/ 571; 95% confidence interval, 7.0-11.9). Seven percent of episodes were assigned a definite cause, 20% a probable cause, 11% a possible cause, and 61% were attributable to 1 or more comorbid conditions. Twenty-eight (53%) of 54 subjects developed delirium after surgery. The delirium had cleared or improved in 40 (74%) of 54 subjects at the time of discharge. CONCLUSIONS: Delirium in patients with hip fracture appears to be a different syndrome from that observed in patients who are otherwise medically ill; it also appears to follow a different clinical course. These results have important implications for the management of delirium in patients with hip fracture.

REF ID: 79

Level I: Systematic Reviews

Topic 1: Risks

Topic 3: Assessment

Topic 4: Management

Britton, A., & Russell, R. (2005). Multidisciplinary team interventions for delirium in patients with chronic cognitive impairment. *The Cochrane Library*.(Oxford), (4)

Software, Research, Systematic Review

A substantive amendment to this systematic review was last made on 17 December 2003. Cochrane reviews are regularly checked and updated if necessary. Background: Delirium is common in hospitalized elderly people. Delirium may affect 60% of frail elderly people in hospital. Among the cognitively impaired, 45% have been found to develop delirium and these patients have longer lengths of hospital stay and a higher rate of complications which, with other factors, increase costs of care. The management of delirium has commonly been multifaceted, the primary emphasis has to be on the diagnosis and therapy of precipitating factors, but as these may not be immediately resolved, symptomatic and supportive care are also of major importance. Objectives: The objective of this review is to assess the available evidence for the effectiveness, if any, of multidisciplinary team interventions in the coordinated care of elderly patients with delirium superimposed on an underlying chronic cognitive impairment in comparison with usual care. Search strategy: The trials were identified from a last updated search of the Specialized Register of the Cochrane Dementia and Cognitive Improvement Group on 3 July 2003 using the terms delirium and confus*. The Register is regularly updated and contains records of all major health care databases and many ongoing trial databases. Selection criteria: Selection for possible inclusion

in this review was made on the basis of the research methodology - controlled trials whose participants are reported as having chronic cognitive impairment, and who then developed incident delirium and were randomly assigned to either coordinated multidisciplinary care or usual care. Data collection and analysis: Nine controlled trials were identified for possible inclusion in the review, only one of which met the inclusion criteria. At present the data from that study cannot be analysed. We have requested additional data from the authors and are awaiting their reply. Main results: No studies focused on patients with prior cognitive impairment, so management of delirium in this group could not be assessed. There is very little information on the management of delirium in the literature despite an increasing body of information about the incidence, risks and prognosis of the disorder in the elderly population. Authors' conclusions: The management of delirium needs to be studied in a more clearly defined way before evidence-based guidelines can be developed. Insufficient data are available for the development of evidence-based guidelines on diagnosis or management. There is scope for research in all areas - from basic pathophysiology and epidemiology to prevention and management. Though much recent research has focused on the problem of delirium, the evidence is still difficult to utilize in management programmes. Research needs to be undertaken targeting specific groups known to be at high risk of developing delirium, for example the cognitively impaired and the frail elderly. As has been highlighted by Inouye 1999, delirium has very important economic and health policy implications and is a clinical problem that can affect all aspects of care of an ill older person. Delirium, though a frequent problem in hospitalized elderly patients, is still managed empirically and there is no evidence in the literature to support change to current practice at this time. [CINAHL Note: The Cochrane Collaboration systematic reviews contain interactive software that allows various calculations in the MetaView.]

REF ID: 117

Level II: Individual experimental study

Topic 3: Assessment

Topic 4: Management

Cole, M. G., McCusker, J., Bellavance, F., Primeau, F. J., Bailey, R. F., Bonnycastle, M. J. et al. (2002 Oct 1). Systematic detection and multidisciplinary care of delirium in older medical inpatients: A randomized trial. *CMAJ Canadian Medical Association Journal*, 167(7), 753-759.

Clinical Trial. Journal Article. Multicenter Study. Randomized Controlled Trial

BACKGROUND: Delirium is common and often goes undetected in older patients admitted to medical services. It is associated with poor outcomes. We conducted a randomized clinical trial to determine whether systematic detection and multidisciplinary care of delirium in older patients admitted to a general medical service could reduce time to improvement in cognitive status. **METHODS:** Consecutive patients aged 65 or more who were newly admitted to 5 general medical units between Mar. 15, 1996, and Jan. 31, 1999, were screened with the Confusion Assessment Method within 24 hours after admission to detect prevalent delirium and rescreened within a week to detect incident cases. Patients with delirium were randomly allocated to receive the intervention or usual care. Subjects in the intervention group were seen by a geriatric specialist consultant and followed in hospital for up to 8 weeks by an intervention nurse who liaised with the consultant, attending physicians, family and the primary care nurses. Subjects in the usual care group received standard hospital services but could consult geriatric specialists as needed. A research assistant, blinded as to treatment allocation, administered within 24 hours after enrolment the MiniMental Status Exam (MMSE), Delirium Index (measuring the severity of the delirium) and Barthel Index (measuring independence of personal care). Improvement was defined as an increase in the MMSE score of 2 or more points, with no decrease below baseline plus 2 points, or no decrease below a baseline MMSE score of 27. A short form of the Informant Questionnaire on Cognitive Decline in the Elderly was completed to identify patients with possible dementia. Subjects were assessed 3 times during the first week and weekly thereafter for up to 8 weeks in hospital or until discharge. Data on clinical severity of illness, length of stay and living arrangements after discharge were also collected. The primary outcome measure was time to improvement in MMSE score. **RESULTS:** Of the 1925 patients who met the inclusion criteria and were screened, 227 had prevalent or incident delirium and consented to participate (113 in intervention group and 114 in usual care group). There were no clinically significant differences between the intervention and usual care groups except for sex (female 58.4% v. 50.0%) and marital status (married 34.8% v. 41.2%). Overall, 48% of the patients in the intervention group and 45% of those in the usual care group met the predetermined criteria for improvement. The Cox proportional hazards ratio (HR) for a shorter time to improvement with the intervention versus usual care, adjusted for age, sex and marital status, was 1.10 (95% confidence interval [CI] 0.74-1.63). There were no significant differences within 8 weeks after enrolment between the 2 groups in time to and rate of improvement of the Delirium Index, the Barthel Index, length of stay, rate of discharge to the community, living arrangements after discharge or survival. Outcomes between the 2 groups did not differ statistically significantly for patients without dementia (HR 1.54, 95% CI 0.80-2.97), for those who had less co-morbidity (HR 1.36, 95%

CI 0.75-2.46) or for those with prevalent delirium (HR 1.15, 95% CI 0.48-2.79). INTERPRETATION:

Systematic detection and multidisciplinary care of delirium does not appear to be more beneficial than usual care for older patients admitted to medical services.

REF ID: 97

Level I: Systematic Reviews

Topic 6: Comprehensive

Cole, M. G., Primeau, F. J., & Elie, L. M. (1998). Delirium: Prevention, treatment, and outcome studies.

Journal of Geriatric Psychiatry & Neurology, 11(3), 126-137.

Journal Article. Meta-Analysis

The purpose of this paper was to contribute to a new conceptual understanding of delirium by reviewing evidence related to its prevention, treatment, and outcome. The review process involved a systematic search of the literature on each topic, assessment of the validity of the studies retrieved, and examination of their results. The literature search identified 10 studies on prevention, 13 studies on treatment, and 15 studies on outcome. Most studies had methodological limitations. A broad spectrum of interventions appeared to be modestly effective in preventing delirium in young and old surgical patients but not elderly medical patients; systematic detection and intervention programs and special nursing care appeared to add large benefits to traditional medical care in young and old surgical patients and modest benefits in elderly medical patients; haloperidol, chlorpromazine, and mianserin appeared to be useful in controlling the symptoms of delirium in both surgical and medical patients; and good levels of premorbid function seemed to be related to better outcomes. Although the above findings do not contribute to a new conceptual understanding of delirium, they do suggest directions for further research on the treatment of delirium.

REF ID: 86

Level II: Individual experimental study

Topic 1: Risks

Topic 3: Assessment

Culp, K. R., Wakefield, B., Dyck, M. J., Cacchione, P. Z., DeCrane, S., & Decker, S. (2004 Aug).

Bioelectrical impedance analysis and other hydration parameters as risk factors for delirium in rural

nursing home residents. *Journals of Gerontology Series A-Biological Sciences & Medical Sciences*, 59(8), 813-817.

Clinical Trial. Journal Article. Randomized Controlled Trial

BACKGROUND: The study investigators conducted a vigorous screening protocol for delirium in rural long-term care (LTC) facilities for a period of 28 days focusing on Bioelectrical Impedance Analysis (BIA) and other hydration parameters as risk factors. METHODS: A two-stage cluster sampling procedure was used to randomly select participants (n = 313) from 13 LTC facilities located in southeastern Iowa, stratified on facility bed size. BIA was used to estimate intracellular water (ICW), extracellular water (ECW), and total body water (TBW) on four occasions--baseline and follow-up days 7, 14, and 28. Volume estimates were calculated as a percent of body weight (%WT). Serum electrolytes and hematology were also measured. Delirium was measured with four strict criteria: a NEECHAM Confusion Scale score \leq 2, a Mini-Mental Status Examination $<$ baseline, and a positive Confusion Assessment Method score. RESULTS: There were n = 69 delirium cases (22.0%). Blood urea nitrogen/creatinine ratios greater than 21:1 (odds ratio = 1.76, 95% confidence interval 1.02-3.06). No significant risk for delirium was associated with ICW, ECW, or TBW as a percent of body weight. CONCLUSIONS: Some changes were observed with a slight decrease in ICW between day 7 and day 14 of follow-up that tended to follow an increase in delirium events, but in general the BIA measures did not predict delirium events. Copyright 2004 The Gerontological Society of America

REF ID: 121

Level I: Systematic Reviews

Topic 3: Assessment

de Rooij, S. E., Schuurmans, M. J., van der Mast, R. C., & Levi, M. (2005; 2005). Clinical subtypes of delirium and their relevance for daily clinical practice: A systematic review. *International Journal of Geriatric Psychiatry*, 20(7), 609-615.

Journal; Peer Reviewed Journal

Background: Delirium is a disorder that besides four essential features consists of different combinations of symptoms. We reviewed the clinical classification of clusters of symptoms in two or three delirium subtypes. The possible implications of this subtype classification may be several. The investigation and exploration of clinical subtypes of delirium may provide information concerning the etiology, the pathogenesis, and the prognosis of

delirium, but also may have therapeutic consequences. Methods: We searched several database for English-language articles. Selected articles were cross-checked for other relevant publications. Data synthesis and conclusion: We conducted a systematic review and retrieved ten clinical studies. The studies described in this review show different results, partly due to methodological problems and possibly by lack of a standard classification for delirium subtypes. According to the present literature a useful and reproducible method to classify (patterns of) symptoms in delirium subtypes seems to be the general rating of and division in to psychomotor subtypes. The Memorial Delirium Assessment Scale (MDAS) and the Dublin Delirium Assessment Scale (DAS) appear to be reliable methods, together with the new version of the Delirium Rating Scale (DRS-R-98). (PsycINFO Database Record (c) 2005 APA, all rights reserved) (journal abstract)

REF ID: 99

Level I: Systematic Reviews

Topic 1: Risks

Elie, M., Cole, M. G., Primeau, F. J., & Bellavance, F. (1998 Mar). Delirium risk factors in elderly hospitalized patients. *Journal of General Internal Medicine, 13*(3), 204-212.

Journal Article. Meta-Analysis

OBJECTIVE: Delirium is frequent in elderly hospitalized patients. Many studies have examined its risk factors, but results have been quite variable. Thus, the goal of this study is to identify through systematic literature review the risk factors associated with the development of delirium in hospitalized geriatric patients.

MEASUREMENTS AND MAIN RESULTS: First, MEDLINE/CURRENT CONTENTS databases were screened for relevant articles published from 1966 to December 1995, and from bibliographies of identified articles additional reports were selected. Second, the reports were screened by two different investigators and retained only if meeting the five following criteria: (1) original research in French or English; (2) prospective study; (3) patients over age 50; (4) minimum of one risk factor examined; (5) acceptable definition of delirium. Third, the methodology of each study was graded according to specific criteria for risk factor studies. Fourth, risk factors were identified and tabulated, unadjusted odds ratios (ORs) were computed, and where appropriate a combined OR with the Mantel-Haenszel estimator was calculated. Twenty-seven articles were retained meeting all of the above criteria. Among these studies, 11 were done on medical patients, 9 on surgical patients, 2 on medical and surgical patients, and 5 on psychiatric patients. In total 1,365 subjects with delirium were studied.

Sixty-one different risk factors were examined, the five most common being dementia, medication, medical illness, age, and male gender. Mantel-Haenszel estimator was calculated for 10 risk factors, the most strongly associated being dementia (OR 5.2; 95% confidence interval [CI] 4.2, 6.3), medical illness (OR 3.8; 95% CI 2.2, 6.4), alcohol abuse (OR 3.3; 95% CI 1.9, 5.5), and depression (OR 1.9; 95% CI 1.3, 2.6). Methodologic weaknesses were present in many studies. CONCLUSIONS: Despite methodologic limitations, certain risk factors for delirium seem to be consistent and could help identify high-risk patients. These risk factors include dementia, advanced age, and medical illness. Other risk factors appear to play a contributory role in the development of delirium in elderly hospitalized patients.

REF ID: 112

Level I: Systematic Reviews

Topic 1: Risks

Ersek, M., Cherrier, M. M., Overman, S. S., & Irving, G. A. (2004). The cognitive effects of opioids. *Pain Management Nursing*, 5(2), 75-93.

Journal Article, Research, Systematic Review, Tables/Charts

Successful opioid therapy often depends on achieving a balance between analgesic effectiveness and side effects. The risk of opioid-induced cognitive impairment often hinders clinicians and patients from initiating or optimizing opioid therapy. Despite subjective experiences of mental dullness and sedation, objective tests of cognitive functioning do not always demonstrate marked changes following opioid administration. To guide clinical practice, as well as patient and family teaching, pain management nurses should be familiar with literature regarding this topic. The purpose of this article is to review the empiric literature on opioids and cognitive functioning, including the relationships among pain, cognition, delirium, and opioids. In general, research reflects minimal to no significant impairments in cognitive functioning. If impairment does occur, it is most often associated with parenteral opioids administered to opioid-naïve individuals. Some evidence suggests that opioids may actually enhance cognitive function and decrease delirium in some patient populations. This article describes this research and explores the clinical implications of the research in this area. (C) 2004 by the American Society of Pain Management Nurses

REF ID: 116

QM: Quality Measures

Topic 3: Assessment

Topic 5: Evaluation/Follow-up

Fayers, P. M., Hjermsstad, M. J., Ranhoff, A. H., Kaasa, S., Skogstad, L., Klepstad, P. et al. (2005 Jul).

Which mini-mental state exam items can be used to screen for delirium and cognitive impairment?

Journal of Pain & Symptom Management, 30(1), 41-50.

Evaluation Studies. Journal Article. Multicenter Study

Cognitive impairment is common in palliative care patients, but it is frequently undetected. The clinical consequence is that psychiatric states such as delirium, which often present with cognitive impairment, are inadequately treated. A short and simple questionnaire for screening of cognitive impairment is required for these patients, in order to proceed with more advanced testing if necessary. In this study, we explored the results from two samples of patients (n=290 and n=217) who had completed the Mini-Mental State Examination (MMSE). Cases of cognitive impairment are considered indicated by an MMSE score of less than 24 of the total 30. We found that caseness could be fairly accurately screened by using four of the original 20 MMSE items, and that a six-item questionnaire further greatly improved the discrimination.

REF ID: 123

Level I: Systematic Reviews

Topic 3: Assessment

Topic 1: Risks

Fick, D. M., Agostini, J. V., & Inouye, S. K. (2002; 2002). Delirium superimposed on dementia: A systematic review. *Journal of the American Geriatrics Society, 50(10), 1723-1732.*

Journal; Peer Reviewed Journal

The purpose of this paper was to conduct a systematic review of the medical literature on delirium superimposed on dementia, to review studies on prevalence, associated features, outcomes, and management. Areas of controversy and gaps in our knowledge are highlighted. Fourteen articles were reviewed from a search of MEDLINE from January 1966 through February 2002 for research studies with primary sources of data. Two of the articles specifically assessed for delirium in Alzheimer's disease or related dementia. The prevalence of

delirium superimposed on dementia ranged from 22% to 89% of hospitalized and community populations aged 65 and older with dementia. To date, only one reported study systematically identified associated factors and interventions, but several studies examining outcomes have found that adverse events are associated with delirium in persons with dementia, including accelerated and long-term cognitive and functional decline, need for institutionalization, rehospitalization, and increased mortality. This paper highlights the dearth of research on delirium superimposed on dementia and stresses the importance of early recognition and prevention. (PsycINFO Database Record (c) 2005 APA, all rights reserved)

REF ID: 81

Level I: Systematic Reviews

Topic 1: Risks

Holmes, J. D., & House, A. O. (2000). Psychiatric illness in hip fracture. *Age and Ageing, 29(6), 537-546.*

Journal Article, Systematic Review, Tables/Charts

OBJECTIVE: to review the literature on the prevalence and effect on outcome of psychiatric illness in older people with hip fracture. METHODS: searching of medical databases and bibliographies to identify relevant studies. Application of predetermined quality criteria for prevalence and outcome studies. RESULTS: 19 studies met criteria for a prevalence study. Rates of psychiatric illness varied, with depression in 9-47%, delirium in 43-61% and unspecified cognitive impairment in 31-88%. Four studies met criteria for an outcome study. Psychiatric illness resulted in increased mortality and dependence and decreased activities of daily living skills. No individual study examined the prevalences and effect on outcome of depression, delirium and dementia separately. CONCLUSIONS: depression, delirium and dementia are common in older people with hip fracture. Further research is required to examine the effect on outcome of psychiatric illness, and the effect of psychiatric interventions in this setting.

REF ID: 98

Level II: Individual experimental study

Topic 3: Assessment

Inouye, S. K., Rushing, J. T., Foreman, M. D., Palmer, R. M., & Pompei, P. (1998 Apr). Does delirium contribute to poor hospital outcomes? A three-site epidemiologic study. *Journal of General Internal*

Medicine, 13(4), 234-242.

Journal Article. Multicenter Study

OBJECTIVE: To determine the independent contribution of admission delirium to hospital outcomes including mortality, institutionalization, and functional decline. DESIGN: Three prospective cohort studies. SETTING: Three university-affiliated teaching hospitals. PATIENTS: Consecutive samples of 727 patients, aged 65 years and older. MEASUREMENTS AND MAIN RESULTS: Delirium was present at admission in 88 (12%) of 727 patients. The main outcome measures at hospital discharge and 3-month follow-up were death, new nursing home placement, death or new nursing home placement, and functional decline. At hospital discharge, new nursing home placement occurred in 60 (9%) of 692 patients, and the adjusted odds ratio (OR) for delirium, controlling for baseline covariates of age, gender, dementia, APACHE II score, and functional measures, was 3.0, (95% confidence interval [CI] 1.4, 6.2). Death or new nursing home placement occurred in 95 (13%) of 727 patients (adjusted OR for delirium 2.1, 95% CI 1.1, 4.0). The findings were replicated across all sites. The associations between delirium and death alone (in 35 [5%] of 727 patients) and between delirium and length of stay were not statistically significant. At 3-month follow-up, new nursing home placement occurred in 77 (13%) of 600 patients (adjusted OR for delirium 3.0; 95% CI 1.5, 6.0). Death or new nursing home placement occurred in 165 (25%) of 663 patients (adjusted OR for delirium 2.6; 95% CI 1.4, 4.5). The findings were replicated across all sites. For death alone (in 98 [14%] of 680 patients), the adjusted OR for delirium was 1.6 (95% CI 0.8, 3.2). Delirium was a significant predictor of functional decline at both hospital discharge (adjusted OR 3.0; 95% CI 1.6, 5.8) and follow-up (adjusted OR 2.7; 95% CI 1.4, 5.2). CONCLUSIONS: Delirium is an important independent prognostic determinant of hospital outcomes including new nursing home placement, death or new nursing home placement, and functional decline—even after controlling for age, gender, dementia, illness severity, and functional status. Thus, delirium should be considered as a prognostic variable in case-mix adjustment systems and in studies examining hospital outcomes in older persons.

REF ID: 126

Level I: Systematic Reviews

Topic 1: Risks

Jones, C., Griffiths, R. D., & Humphris, G. (2000; 2000). Disturbed memory and amnesia related to intensive care. *Memory*, 8(2), 79-94.

Journal; Peer Reviewed Journal

Conducts a review of memory problems experienced by intensive care unit (ICU) patients. A systematic literature review of computer databases (Medline, PsycLit, and CINAHL) identified 25 relevant papers. In addition, other relevant articles were obtained, citation lists and associated articles retrieved. Due to lack of research on processes underlying memory problems in ICU patients all articles that introduced an insight into possible mechanisms were included in the review. There seem to be two possible processes contributing to memory problems in ICU patients. First the illness and treatment may have a general dampening effect on memory. Delirium and sleep disturbance are both common in ICU patients. Delirium can result in a profound amnesia for the period of confusion. Sleep deprivation exacerbates the confusional state. Slow wave sleep is important for the consolidation of episodic memories. Treatment administered to patients in ICU can have effects on memory. Opiates, benzodiazepines, sedative drugs such as propofol, adrenaline, and corticosteroids can all influence memory. In addition, the withdrawal of drugs, such as benzodiazepines, can cause profound withdrawal reactions, which may contribute to delirium. (PsycINFO Database Record (c) 2005 APA, all rights reserved)

REF ID: 82

Level II: Individual experimental study

Topic 4.3: Management-Medication

Kalisvaart, K. J., de Jonghe, J. F., Bogaards, M. J., Vreeswijk, R., Egberts, T. C., Burger, B. J. et al. (2005 Oct). Haloperidol prophylaxis for elderly hip-surgery patients at risk for delirium: A randomized placebo-controlled study. *Journal of the American Geriatrics Society*, 53(10), 1658-1666.

Journal Article. Randomized Controlled Trial

OBJECTIVES: To study the effectiveness of haloperidol prophylaxis on incidence, severity, and duration of postoperative delirium in elderly hip-surgery patients at risk for delirium. **DESIGN:** Randomized, double-blind, placebo-controlled trial. **SETTING:** Large medical school-affiliated general hospital in Alkmaar, The Netherlands. **PARTICIPANTS:** A total of 430 hip-surgery patients aged 70 and older at risk for postoperative delirium. **INTERVENTION:** Haloperidol 1.5 mg/d or placebo was started preoperatively and continued for up to 3 days postoperatively. Proactive geriatric consultation was provided for all randomized patients. **MEASUREMENTS:** The primary outcome was the incidence of postoperative delirium (Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, and Confusion Assessment Method criteria). Secondary

outcomes were the severity of delirium (Delirium Rating Scale, revised version-98 (DRS-R-98)), the duration of delirium, and the length of hospital stay. RESULTS: The overall incidence of postoperative delirium was 15.8%. The percentage of patients with postoperative delirium in the haloperidol and placebo treatment condition was 15.1% and 16.5%, respectively (relative risk=0.91, 95% confidence interval (CI)=0.6-1.3); the mean highest DRS-R-98 score+/-standard deviation was 14.4+/-3.4 and 18.4+/-4.3, respectively (mean difference 4.0, 95% CI=2.0-5.8; P<.001); delirium duration was 5.4 versus 11.8 days, respectively (mean difference 6.4 days, 95% CI=4.0-8.0; P<.001); and the mean number of days in the hospital was 17.1+/-11.1 and 22.6+/-16.7, respectively (mean difference 5.5 days, 95% CI=1.4-2.3; P<.001). No haloperidol-related side effects were noted.

CONCLUSION: Low-dose haloperidol prophylactic treatment demonstrated no efficacy in reducing the incidence of postoperative delirium. It did have a positive effect on the severity and duration of delirium. Moreover, haloperidol reduced the number of days patients stayed in the hospital, and the therapy was well tolerated.

REF ID: 91

Level II: Individual experimental study

Topic 3: Assessment

Laurila, J. V., Pitkala, K. H., Strandberg, T. E., & Tilvis, R. S. (2002 Dec). Confusion assessment method in the diagnostics of delirium among aged hospital patients: Would it serve better in screening than as a diagnostic instrument? *International Journal of Geriatric Psychiatry*, 17(12), 1112-1119.

Clinical Trial. Journal Article. Multicenter Study. Randomized Controlled Trial

BACKGROUND: The Confusion Assessment Method (CAM) is an easy, four-step algorithmic diagnostic test developed to detect delirium. OBJECTIVE: To determine how sensitive and specific the CAM is in diagnosing delirium when compared with fully operationalized criteria of delirium according to the Diagnostic and Statistical Manual of Mental Disorders (DSM) editions III, III revised, and IV, and the International Classification of Diseases (ICD) 10th edition. METHODS: A cross-sectional study with blinded assessments was performed on consecutive elderly patients (>70 years) (n=81) in two acute geriatric hospitals in Helsinki, Finland. The sensitivity, specificity, likelihood ratios, and positive and negative predictive values of CAM were assessed with the DSM-III, DSM-III-R, DSM-IV, and ICD-10 criteria of delirium used as reference standards. RESULTS: Sensitivity rates of the CAM were proved to be only moderate (0.81-0.86) against all formal criteria

of delirium. The specificity rates were lower (0.63-0.84), and far less than reported in previous studies using global assessment of the reference standard. Instead of the DSM-III-R, from which it is derived, the CAM seems more concordant with the DSM-IV criteria of delirium. The likelihood ratio for a positive CAM test was 5.06 and for a negative test 0.23, when compared with the DSM-IV. CONCLUSION: The CAM seems to be an acceptable screening instrument for delirium, but the diagnosis should be ensured according to the formal criteria of delirium, preferably by the DSM-IV. Copyright 2002 John Wiley & Sons, Ltd.

REF ID: 120

Level VI: Opinion

Topic 1: Risks

Topic 3: Assessment

Topic 4.3: Management-Medication

Leentjens, A. F. G., & van der Mast, Rose C. (2005; 2005). Delirium in elderly people: An update. *Current Opinion in Psychiatry*, 18(3), 325-330.

Journal; Peer-Reviewed Status-Unknown

Purpose of review: To review recent studies on epidemiology, diagnosis, pathophysiology, treatment and prevention of delirium in elderly people. Recent findings: There is no evidence that the clinical picture of delirium in elderly people differs from that in younger patients, although it may run a more chronic course. Diagnosing delirium in demented patients, however, may be difficult due to overlap in symptoms of delirium and dementia. Systematic use of screening and diagnostic instruments may help to diminish the common underdiagnosis of delirium. Delirium is best understood as the result of multiple interacting predisposing and precipitating factors. In the elderly, predisposing factors that make patients more susceptible for delirium include cognitive dysfunction and older age, while important precipitating factors that directly cause delirium are any somatic events and the use of anticholinergic drugs. Delirium has a significant negative prognostic impact on functional and cognitive outcome, as well as on morbidity and mortality. Haloperidol remains the standard treatment for delirium, while there is some evidence for the efficacy of risperidone. Other atypical antipsychotics, as well as cholinesterase inhibitors, have not yet been sufficiently studied. Results of studies on the effectiveness of systematic screening of populations at risk and standardized interventions to prevent delirium have been inconclusive. Summary: In recent years, the emphasis in the approach to delirium has shifted from ad hoc

treatment to systematic screening and prevention. Interest has been raised in treatment options other than haloperidol, such as atypical antipsychotics and procholinergic drugs. (PsycINFO Database Record (c) 2005 APA, all rights reserved) (journal abstract)

REF ID: 119

Level IV: Non-experimental study

Topic 1: Risks

Topic 4: Management

Leo, R. J., & Baer, D. (2005; 2005). Delirium associated with baclofen withdrawal: A review of common presentations and management strategies. *Psychosomatics: Journal of Consultation Liaison Psychiatry*, 46(6), 503-507.

Journal; Peer Reviewed Journal

The authors reviewed 23 published cases of psychiatric symptoms in association with baclofen withdrawal. Delirium, and not other functional psychiatric conditions, arose secondarily from abrupt baclofen cessation. Vulnerability to baclofen-withdrawal delirium appeared to be greater in individuals who received chronic baclofen therapy. Baclofen-withdrawal delirium can be difficult to distinguish from delirium of other etiologies, and unrecognized and inadequately treated baclofen-withdrawal delirium is associated with significant morbidity and mortality. Complete resolution of delirium symptoms was possible with reinstatement of baclofen. The clinical management of patients experiencing baclofen-withdrawal delirium includes supportive interventions to reduce complications of delirium until symptoms resolve. (PsycINFO Database Record (c) 2006 APA, all rights reserved) (journal abstract)

REF ID: 90

Level II: Individual experimental study

Topic 3: Assessment

McCarthy, M. C. (2003 Jun). Detecting acute confusion in older adults: Comparing clinical reasoning of nurses working in acute, long-term, and community health care environments. *Research in Nursing & Health*, 26(3), 203-212.

Journal Article. Multicenter Study

In an article on a previous study involving hospitalized older adults (McCarthy, 2003), it was argued that the theory of situated clinical reasoning explains why nurses often fail to recognize acute confusion. Further, the theory illuminates how nurses' perspectives toward health in aging affect the ways they regard and ultimately deal with older people in this particular clinical situation. The purpose of the current study was to challenge and refine the theory by exploring the influence of different care environments on clinical reasoning related to acute confusion. Following a period of participant observation, a purposive sample of 30 nurses, 10 each from a teaching hospital, a long-term facility, and a home care agency, participated in semistructured interviews. Dimensional analysis provided the methodological framework for data collection and interpretation. The results reinforce prior findings that the ability of nurses to recognize acute confusion and to distinguish it from dementia can be attributed to their personal philosophies about aging. Care environment was identified as a factor that influenced clinical reasoning in limited ways under certain conditions and within certain contexts. Copyright 2003 Wiley Periodicals, Inc. Res Nurs Health 26: 203-212, 2003

REF ID: 113

Level I: Systematic Reviews

Topic 1: Risks

McNicol, E., HorowiczMehler, N., Fisk, R. A., Bennett, K., GialeliGoudas, M., Chew, P. W. et al. (2003).

Management of opioid side effects in cancer-related and chronic noncancer pain: A systematic review.

Journal of Pain, 4(5), 231-256.

Journal Article, Research, Systematic Review, Tables/Charts

Side effects can limit opioid dosage and reduce quality of life. The purpose of this systematic review was to assess the management of opioid side effects in the context of cancer pain management or, in the event that no evidence was available for cancer pain, for chronic noncancer pain. The side effects studied were constipation, pruritus, nausea and vomiting, myoclonus, sedation, respiratory depression, and delirium. Opioid rotation to manage side effects was also studied. For each side effect, we searched MEDLINE and the Cochrane Controlled Trials Register and identified 657 possible titles for inclusion. Of these, 67 studies met inclusion criteria for analysis. The lack of well-designed, randomized controlled trials and the heterogeneity of populations and study designs made the drawing of firm conclusions difficult and precluded performance of meta-analysis. The type, strength, and consistency of evidence for available interventions to manage opioid side effects vary from strong

(eg, on the use of naloxone to reverse respiratory depression or constipation) to weak (eg, changing from the oral to epidural route of morphine administration to manage sedation). Well-designed trials in the specified populations are required to furnish clinicians with secure evidence on managing opioid side effects successfully.

REF ID: 124

Level VI: Opinion

Topic 6: Comprehensive

Topic 4: Management

Meagher, D. J. (2001; 2001). Delirium: Optimising management. *BMJ: British Medical Journal*, 322(7279), 144-149.

Journal; Peer Reviewed Journal

Delirium is a complex neuropsychiatric syndrome with an acute onset and fluctuating course; it is common in all medical settings and poses a substantial challenge for clinicians. Delirium occurs in about 15-20% of all general admissions to hospital; it occurs with higher frequency in elderly people and in those with pre-existing cognitive impairment. This article discusses clinical features, identification, risk factors, causes, and treatment of delirium, including supportive and environmental measures, drug treatment, emerging therapies, and managing patients after discharge. Delirium comprises a wide of range of symptoms, but the prevailing narrow definition impedes diagnosis and efforts to improve treatment. Diagnosis can be improved by clinicians becoming more aware of hypoactive presentations, incorporating cognitive assessment into routine practice, and using simple screening instruments. Environmental strategies for treatment are free of adverse effects but are underutilized. Neuroleptics (such as haloperidol) continue to be used as first line treatment, but benzodiazepines are indicated in specific situations. (PsycINFO Database Record (c) 2005 APA, all rights reserved)

REF ID: 127

QM: Quality Measures

Topic 5: Evaluation/Follow-up

Mentes, J., Culp, K., Maas, M., & Rantz, M. (1999 Apr). Acute confusion indicators: Risk factors and prevalence using MDS data. *Research in Nursing & Health*, 22(2), 95-105.

Journal Article, Research, Tables/Charts

OBJECTIVE: The purpose of this study was to use Minimum Data Set (MDS) data from LTC (long-term care) in one Midwestern state to test whether risk variables derived from a conceptual model developed from findings in acute care predicted acute confusion in long-term care residents. **DESIGN:** Cross-sectional. **SETTING:** MDS nursing home records. **POPULATION:** The sample was composed predominantly of women (n = 1,775). **INTERVENTIONS:** The 1995 MIS annual reviews of nursing home residents from a Midwestern state provided the data for analysis; however missing data, on the average about 10% for the acute confusion/delirium indicators, reduced the sample to 2,318. Based on the conceptual model and items available in the MDS, precipitating factors selected for analysis included: dehydration, hypoxia, infections, and medications. Individual vulnerability factors selected for analysis included: age, diagnosis of dementia, various chronic medical diagnoses/conditions, indicators of frailty such as falls; multiple medications; and sensory impairments. **MAIN OUTCOME MEASURE(S):** The prevalence of acute confusion found in these data (13.98%) is similar to other studies of acute confusion prevalence in abstracted data files. Frequencies of the indicators suggest that cognitive ability variation and periods of motor restlessness/lethargy are the most readily recognized symptoms of acute confusion by nursing home staff. Of the variables that were significant in the univariate analysis, the only variables that contributed to the explanation of acute confusion in the logistic regression analysis were inadequate fluid intake, dementia status, and a fall in the past 30 days. The strongest contributing factor to acute confusion in this population was inadequate fluid intake. Although medications are the most frequent cause of acute confusion in older hospital patients, possibly because of the age-related sensitivity of the brain to the effects of drugs, this was not the case in these LTC residents. **RESULTS/CONCLUSIONS:** Although these results support the hypothesized relationship of dehydration and acute confusion, limitations of this cross-sectional analysis need to be addressed. The items used for fluid intake lacked the accuracy of quantitative measurement in a more precise clinical investigation. There is a concern about the reliability of the delirium indicators. Hawes et al. conclude that nursing home staff do not consistently detect and document these indicators. Also, the amount of missing data is of concern. Future research endeavors should focus on refining the assessment of acute confusion in LTC. Other research efforts should focus on using the MDS data to identify areas for clinical intervention. The MDS is one of the few mandated clinical databases that captures nursing care. Nurses involved in health services research can use the data to affect nursing care issues in long-term care.

[CINAHL abstract]

Level I: Systematic Reviews

Topic 4: Management

Milisen, K., Lemiengre, J., Braes, T., & Foreman, M. D. (2005 Oct). Multicomponent intervention strategies for managing delirium in hospitalized older people: Systematic review. *Journal of Advanced Nursing*, 52(1), 79-90.

Journal Article. Meta-Analysis. Review

AIM: The aim of this systematic review was to determine the characteristics and efficacy of various multicomponent intervention strategies for delirium in hospitalized older people. BACKGROUND: Delirium is a common accompaniment to acute illness in hospitalized older people and has greater costs of care concurrent as well as greater morbidity and mortality. METHODS: A comprehensive search was undertaken involving all major databases (including the Cochrane Library, Medline, Cumulative Index for Nursing and Allied Health Literature and Invert) and reference lists of all relevant papers. Selection criteria were: evaluation of a multicomponent intervention for delirium, inclusion of an operational definition for delirium consistent with the Diagnostic and Statistical Manual of Mental Disorders-criteria, randomized controlled trials, studies with a quasi-experimental design and reporting on primary data. To generate a description of the characteristics of these multicomponent strategies, the components of these programmes were identified and categorized. Effects on incidence of delirium, cognitive functioning, duration and severity of delirium, functional status, hospital length of stay, and mortality were analysed. FINDINGS: Three randomized controlled trials, three controlled studies and one before-after study were identified. Intervention strategies to prevent delirium proved to be the most efficacious in reducing its incidence, both with surgical and medical patients. Some additional positive effects of preventive strategies were found on the duration and severity of delirium, and functional status. Conversely, strategies to treat delirium were rather ineffective in older people admitted to medical services. In a population of older people admitted for surgery, however, a shorter duration and a diminished severity of delirium were demonstrated. None of intervention strategies produced beneficial effects on length of stay or mortality. CONCLUSION: Multicomponent interventions to prevent delirium are the most effective and should be implemented through synergistic cooperation between the various healthcare disciplines. Nurses should play a pivotal role in prevention, early recognition and treatment. [References: 58]

REF ID: 89

Level II: Individual experimental study

Topic 1: Risks

Nishikawa, K., Nakayama, M., Omote, K., & Namiki, A. (2004 Feb). Recovery characteristics and post-operative delirium after long-duration laparoscope-assisted surgery in elderly patients: Propofol-based vs. sevoflurane-based anesthesia. *Acta Anaesthesiologica Scandinavica*, 48(2), 162-168.

Clinical Trial. Journal Article. Randomized Controlled Trial

BACKGROUND: Post-operative mental dysfunction may be an important problem in elderly patients. This study was designed to compare the effects of propofol and sevoflurane anesthesia on recovery characteristics and the incidence of post-operative delirium (POD) in long-duration laparoscopic surgery for elderly patients.

METHODS: Fifty ASA physical status I-II patients over the age of 65 scheduled for laparoscopic surgery lasting 3 h or more randomly received propofol (group P, n = 25) or sevoflurane (group S, n = 25) for both induction and maintenance of general anesthesia. Both groups were combined with continuous perioperative epidural analgesia. The level of primary anesthetics was adjusted to maintain changes in mean arterial pressure within 20% of the pre-anesthetic values. The emergence times from anesthesia (eye opening, extubation, response to command, and orientation) were recorded, and the occurrence of POD was assessed by the delirium rating scale (DRS) during the first 3 days after surgery. All patients received oxygen and continuous epidural analgesia postoperatively.

RESULTS: Immediate emergence, i.e. eye opening and extubation was significantly faster after sevoflurane ($P < 0.05$). There was no significant difference between the incidences of POD in the two groups during the first 3 days after surgery. The scores for DRS on day 2 and 3 after surgery, however, were significantly higher in group P than in group S ($P < 0.01$). CONCLUSION: Sevoflurane may be preferable to propofol for general anesthesia in combination with epidural analgesia with respect to less effect on mental function during the early postoperative period for long-duration laparoscopic surgery in elderly patients.

REF ID: 106

Level I: Systematic Reviews

Topic 4.3: Management-Medication

Olin, J., Schneider, L., Novit, A., & Luczak, S. (2006). Hydergine for dementia. *Cochrane Database of Systematic Reviews*, 1

Systematic Review

Background: Currently hydergine is used almost exclusively for treating patients with either dementia, or 'age-related' cognitive symptoms. Since the early eighties there have been over a dozen more clinical trials, yet hydergine's efficacy remains uncertain. Although previous reviews offer generally favorable support for hydergine's efficacy, they were, however, limited by a bias with respect to the particular clinical studies chosen (eg, the inclusion of case reports, and uncontrolled trials), and by authors' impressionistic assessments of results. Not surprisingly, there has been a lack of consensus among reviewers with regard to the efficacy of hydergine. In 1994, a meta-analysis was published by the present reviewers who reported that overall, hydergine was more effective than placebo. However they also observed that the statistical evidence for efficacy in 'possible or probable Alzheimer's disease' patients was so modest that one additional statistically non-significant trial would have reduced the results to non significance. Objectives: Because of uncertainty surrounding the efficacy of hydergine, the goals of this overview were to assess its overall effect in patients with possible dementia, and to investigate potential moderators of an effect. Search strategy: The trials were identified from a search of the Specialised Register of the Cochrane Dementia and Cognitive Improvement Group on 15 November 2000 using the terms hydergin*, ergoloid* and dihydroergo*. Two proprietary databases were searched also. Published reviews were inspected for further sources. Selection criteria: Trials to be included must be randomized, double-blind, parallel-group, and unconfounded comparisons of hydergine with placebo for a treatment duration of greater than 1 week in subjects with dementia or symptoms consistent with dementia. Data collection and analysis: Data were extracted independently by the reviewers, pooled where appropriate and possible, and the pooled odds ratios (95%CI) or the average differences (95%CI) were estimated. Where possible, intention-to-treat data were used. Outcomes of interest included clinical global impressions of change and comprehensive rating scales. Potential moderating variables of a treatment effect included: inpatient/outpatient status, trial duration, age, sex, medication dose, publication year, and diagnostic grouping. Main results: There were a total of nineteen trials that met inclusion criteria and that had data sufficient for analysis. Thirteen trials reported sufficient information to use a global rating of improvement and nine trials provided information on a comprehensive rating scale. Three trials provided both outcome measures. It was not possible to use many of the published results in a combined analysis owing to the lack of sufficient data to perform statistical analyses. For the twelve trials that used global ratings, there was a significant effect favoring hydergine (OR 3.78, 95%CI, 2.72-5.27). For the nine trials that used comprehensive ratings, there was a significant mean difference favoring

hydergine (WMD 0.96, 95% CI, 0.54-1.37). Hydergine was well tolerated in these trials, with 78% of randomized subjects available for data analyses. Greater effect sizes on global ratings were associated with younger age, and possibly higher dose, although most of the subgroup analyses were statistically insignificant. Conclusions: As in an earlier systematic review, we found hydergine to show significant treatment effects when assessed by either global ratings or comprehensive rating scales (based here on a smaller set of trials than in the earlier published systematic review because trials were required to have data that could conform with MetaView, the Cochrane Collaboration statistics software). The small number of trials available for analysis, however, limited the ability of subgroup analyses to identify statistically significant moderating effects. Unfortunately, most of the randomized, double-blind, and placebo-controlled trials of hydergine were conducted and published before the advent of consensus-based diagnostic standards of dementia in 1984; therefore diagnostic criteria were less specific. As a result, uncertainty remains regarding hydergine's efficacy in dementia.

REF ID: 84

Level II: Individual experimental study

Topic 4.3: Management-Medication

Topic 1: Risks

Papaioannou, A., Fraidakis, O., Michaloudis, D., Balalis, C., & Askitopoulou, H. (2005 Jul). The impact of the type of anaesthesia on cognitive status and delirium during the first postoperative days in elderly patients. *European Journal of Anaesthesiology*, 22(7), 492-499.

Clinical Trial. Journal Article. Randomized Controlled Trial

BACKGROUND AND OBJECTIVES: Postoperative confusion and delirium is a common complication in the elderly with a poorly understood pathophysiology. The aim of this study was to examine whether the type of anaesthesia (general or regional) plays a role in the development of cognitive impairment in elderly patients during the immediate postoperative period. **METHODS:** Forty-seven patients > 60 yr of age and undergoing major surgery were randomly allocated to receive either regional or general anaesthesia. The mental status of the patients was assessed preoperatively and during the first three postoperative days with the Mini Mental State Examination. The incidence of delirium was also examined during the same period with the use of DSM III criteria. **RESULTS:** Overall, during the first three postoperative days, the mean Mini Mental State Examination score decreased significantly ($P < 0.001$). However, this decline was very significant only in patients assigned to

receive general anaesthesia ($P < 0.001$) compared to regional anaesthesia. Nine patients developed delirium but the type of anaesthesia did not affect its incidence. The only important factor for the development of delirium was preexisting cardiovascular disease irrespective of anaesthesia type ($P < 0.025$). CONCLUSIONS: Elderly patients subjected to general anaesthesia displayed more frequent cognitive impairment during the immediate postoperative period in comparison to those who received a regional technique.

REF ID: 87

Level II: Individual experimental study

Topic 4.3: Management-Medication

Parellada, E., Baeza, I., de Pablo, J., & Martinez, G. (2004 Mar). Risperidone in the treatment of patients with delirium. *Journal of Clinical Psychiatry*, 65(3), 348-353.

Clinical Trial. Journal Article. Multicenter Study

BACKGROUND: The aim of this study was to evaluate the efficacy and safety of risperidone in the treatment of patients with delirium. METHOD: We conducted a prospective, multicenter, observational 7-day study in 5 university general hospitals. Sixty-four patients (62.5% male [N = 40]; mean age: 67.3 +/- 11.4 years) hospitalized due to a medical condition who met criteria for delirium according to DSM-IV were enrolled in the study. Fifty-six patients received 7 days of treatment or less, while 8 patients continued treatment for more than 7 days. Effectiveness was assessed using the Trzepacz Delirium Rating Scale (DRS), the positive subscale of the PANSS (PANSS-P), the Mini-Mental State Examination (MMSE), and the Clinical Global Impressions scale (CGI). Safety assessment included the UKU Side Effect Rating Scale. Risperidone was administered at the time of diagnosis, and treatment was maintained according to clinical response. Response to treatment was defined as a reduction in DRS score to below 13 within the first 72 hours. Data were gathered from April to December 2000. RESULTS: Risperidone (mean dose = 2.6 +/- 1.7 mg/day at day 3) was effective in 90.6% (58/64) of the patients and significantly improved all symptoms measured by the scales from baseline to day 7 (mean scores: DRS, 22.5 +/- 4.6 at baseline to 6.8 +/- 7.0 at day 7; PANSS-P, 21.5 +/- 8.8 to 10.1 +/- 7.3; MMSE, 13.1 +/- 10.9 to 26.4 +/- 8.9; and CGI, 4.5 +/- 0.9 to 1.9 +/- 1.2) (Friedman test, $p < .001$ in all cases). Two patients (3.1%) experienced adverse events, but none showed extrapyramidal symptoms. CONCLUSIONS: Low-dose risperidone proved to be a safe and effective drug in the treatment of symptoms of delirium in medically hospitalized patients. These data provide the rationale for a prospective randomized controlled trial.

Level II: Individual experimental study

Topic 3: Assessment

Pun, B. T., Gordon, S. M., Peterson, J. F., Shintani, A. K., Jackson, J. C., Foss, J. et al. (2005 Jun). Large-scale implementation of sedation and delirium monitoring in the intensive care unit: A report from two medical centers.[see comment]. *Critical Care Medicine*, 33(6), 1199-1205.

Journal Article. Multicenter Study

OBJECTIVE: To implement sedation and delirium monitoring via a process-improvement project in accordance with Society of Critical Care Medicine guidelines and to evaluate the challenges of modifying intensive care unit (ICU) organizational practice styles. DESIGN: Prospective observational cohort study. SETTING: The medical ICUs at two institutions: the Vanderbilt University Medical Center (VUMC) and a community Veterans Affairs hospital (York-VA). SUBJECTS: Seven hundred eleven patients admitted to the medical ICUs for >24 hrs and followed over 4,163 days during a 21-month study period. INTERVENTIONS: Unit-wide nursing documentation was changed to accommodate a sedation scale (Richmond Agitation-Sedation Scale) and delirium instrument (Confusion Assessment Method for the ICU). A 20-min introductory in-service was performed for all ICU nurses, followed by graded, staged educational interventions at regular intervals. Data were collected daily for compliance, and randomly 40% of nurses each day were chosen for accuracy spot-checks by reference raters. An implementation survey questionnaire was distributed at 6 months. MEASUREMENTS AND MAIN RESULTS: The implementation project involved 64 nurses (40 at VUMC and 24 at York-VA). Sedation and delirium monitoring data were recorded for 711 patients (614 at VUMC and 97 at York-VA). Compliance with the Richmond Agitation-Sedation Scale was 94.4% (21,931 of 23,220) at VUMC and 99.7% (5,387 of 5,403) at York-VA. Compliance with the Confusion Assessment Method for the ICU was 90% (7,323 of 8,166) at VUMC and 84% (1,571 of 1,871) at York-VA. The Confusion Assessment Method for the ICU was performed more often than requested on 63% of shifts (5,146 of 8,166) at VUMC and on 8% (151 of 1871) of shifts at York-VA. Overall weighted-kappa between bedside nurses and references raters for the Richmond Agitation-Sedation Scale were 0.89 (95% confidence interval, 0.88 to 0.92) at VUMC and 0.77 (95% confidence interval, 0.72 to 0.83) at York-VA. Overall agreement (kappa) between bedside nurses and reference raters using the Confusion Assessment Method for the ICU was 0.92 (95% confidence interval, 0.90-0.94) at VUMC and 0.75 (95% confidence interval, 0.68-0.81) at York-VA. The two most-often-cited barriers to implementation were physician

buy-in and time. CONCLUSIONS: With minimal training, the compliance of bedside nurses using sedation and delirium instruments was excellent. Agreement of data from bedside nurses and a reference-standard rater was very high for both the sedation scale and the delirium assessment over the duration of this process-improvement project.

REF ID: 96

Level II: Individual experimental study

Topic 3: Assessment

Topic 1: Risks

Sandberg, O., Gustafson, Y., Brannstrom, B., & Bucht, G. (1999 Nov). Clinical profile of delirium in older patients. *Journal of the American Geriatrics Society*, 47(11), 1300-1306.

Journal Article. Multicenter Study

OBJECTIVE: To examine the prevalence, psychiatric and behavior symptoms, differing symptom profiles, and diurnal variations of delirium in older patients. DESIGN: A descriptive, point prevalence study with a cross-sectional design. SETTING: One ordinary county hospital (n = 148), three nursing homes (n = 202), five old people's homes (n = 196), and home medical care patients (n = 171) in parts of a hospital catchment area in Mid-Sweden. PARTICIPANTS: A total of 717 patients 75 years of age and older were observed and assessed for the prevalence of delirium. Women accounted for 66.4% of the studied population, and the mean age for both sexes was 83.7 years. MEASUREMENTS: All patients were examined using the OBS (Organic Brain Syndrome) scale, and delirium was diagnosed according to DSM-III-R. RESULTS: Delirium was diagnosed in 315 of 717 (43.9%) patients, and 135 of 315 (42.9%) of the delirious patients had dementia. Thirty-seven percent of the patients with delirium were delirious in the afternoon, evening, or at night, and 47% of the delirious patients had morning delirium. The delirious patients presented a wide variety of psychiatric symptoms. More than half the patients exhibiting anxiety, psychomotor slowing, depressed mood, and irritability. Nearly 26% were classified as having hypoactive, 22% as having hyperactive, and 42% as having mixed delirium, whereas 11% had neither hypo- nor hyperactive delirium. Seventy-seven percent were classified as having delirium with pronounced emotional and 43% with pronounced psychotic symptoms. CONCLUSIONS: This study shows that patients with delirium have very different clinical profiles. This might indicate a need for different treatment strategies for patients with different types of delirium.

REF ID: 122

Level VI: Opinion

Topic 4.3: Management-Medication

Schwartz, T. L., & Masand, P. S. (2002; 2002). The role of atypical antipsychotics in the treatment of delirium. *Psychosomatics: Journal of Consultation Liaison Psychiatry*, 43(3), 171-174.

Journal; Peer Reviewed Journal

This paper reviews the pertinent literature and summarizes tentative guidelines for novel antipsychotic use in delirium. Delirium is generally characterized by acute disturbances of consciousness, cognition, and perception that are precipitated by an underlying medical condition. The gold standard of psychiatric treatment is to treat the underlying medical cause and use high-potency antipsychotics to treat the clinical manifestations of delirium. In the early 1990s, a new generation of novel antipsychotics was developed. Their mechanism of action, preferential serotonergic (5HT-sub-2-sub(a)) blockade, results in a markedly lower rate of extrapyramidal side effects, an advantage over the typical, older antipsychotic medications. These agents have been shown to be effective and well tolerated in common psychotic disorders (e.g., schizophrenia or bipolar disorder), but few studies have evaluated them in the treatment of delirium. (PsycINFO Database Record (c) 2005 APA, all rights reserved)

REF ID: 88

Level II: Individual experimental study

Topic 4.3: Management-Medication

Skrobik, Y. K., Bergeron, N., Dumont, M., & Gottfried, S. B. (2004 Mar). Olanzapine vs haloperidol: Treating delirium in a critical care setting. *Intensive Care Medicine*, 30(3), 444-449.

Clinical Trial. Journal Article. Randomized Controlled Trial

OBJECTIVE: To compare the safety and estimate the response profile of olanzapine, a second-generation antipsychotic, to haloperidol in the treatment of delirium in the critical care setting. DESIGN: Prospective randomized trial. SETTING: Tertiary care university affiliated critical care unit. PATIENTS: All admissions to a medical and surgical intensive care unit with a diagnosis of delirium. INTERVENTIONS: Patients were randomized to receive either enteral olanzapine or haloperidol. MEASUREMENTS: Patient's delirium severity and benzodiazepine use were monitored over 5 days after the diagnosis of delirium. MAIN RESULTS: Delirium Index decreased over time in both groups, as did the administered dose of benzodiazepines. Clinical

improvement was similar in both treatment arms. No side effects were noted in the olanzapine group, whereas the use of haloperidol was associated with extrapyramidal side effects. CONCLUSIONS: Olanzapine is a safe alternative to haloperidol in delirious critical care patients, and may be of particular interest in patients in whom haloperidol is contraindicated.

REF ID: 92

Level II: Individual experimental study

Topic 1: Risks

Somprakit, P., Lertakyamane, J., Satraratanamai, C., Wanicksamban, S., Silapadech, A., Chainchop, P. et al. (2002 Sep). Mental state change after general and regional anesthesia in adults and elderly patients, a randomized clinical trial. *Journal of the Medical Association of Thailand*, 85(Suppl 3), S875-83.

Clinical Trial. Journal Article. Randomized Controlled Trial

BACKGROUND: Mental state changes after anesthesia seemed to be more frequent in older patients, but the results were still unclear. OBJECTIVE: To compare the mental scores between adults and elderly patients after general and regional anesthesia. METHODS: This was a stratified randomized trial with factorial design. Sixty patients ≥ 60 years old and sixty patients < 60 years old were randomly assigned to receive general or regional anesthesia. Their mental states were assessed blind by investigators, using the Thai Mental State Examination score. RESULTS: The two anesthetic groups showed no difference in the mental scores, but the two age groups showed significantly different scores. The components of mental states that were significantly different were orientation and recall. There were no significant differences in registration, attention, calculation and language. The model for predicting the score included age, education level and narcotics given within six hours before assessment. Sex, weight, intraoperative hypotension, blood loss and duration of anesthesia could not explain the change in the scores. CONCLUSION: Age, but not anesthetic technique, affected the mental scores after anesthesia.