

21ST EDA ANNUAL CONFERENCE

Poster Abstracts

Delirium: From Mechanisms to Better Care

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For untitled abstracts, short descriptive titles have been added in italics.

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POSTER 1

THURSDAY 5 NOVEMBER 2026

Cefepime and Neurotoxicity An Underestimated Complication in the Geriatric Population

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Switzerland

Cefepime is a widely used fourth-generation cephalosporin for the treatment of nosocomial infections but is known for its potential neurotoxicity, particularly in elderly and frail patients. This condition, characterized by cognitive impairment and confusion, occurs more frequently in the presence of renal insufficiency and/or suboptimal dosing. This paper presents two cases of geriatric patients, who developed cefepime-associated neurotoxicity.

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POSTER 3

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Music interventions: number needed to treat

Jetske M. Stoop, Thomas H. Ottens, Markus Klimek

Netherlands

Background/Aims: This report aims to calculate a Number Needed to Treat to provide a clinically insightful statistic of the effectiveness of music interventions to prevent delirium in hospitalized patients.

Methods: The number of patients that need to be treated with an intervention to achieve the intended effect, is the inverse of the absolute risk reduction, which is calculated by multiplying the a priori risk of delirium, i.e. the prevalence, with the relative risk reduction as a result of music intervention.

Results: With a prevalence of 23% in all hospitalized patients, and 31% in critically ill patients, and a risk reduction of 0.48, the Number Needed to Treat of music intervention to prevent delirium is 9.1 and 6.9, respectively.

Conclusions: The relatively low Number Needed to Treat against delirium pleads for the implementation of music intervention, particularly given that the risk of side-effects is negligible and few resources are required.

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POSTER 5

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Delirium recognition in older medical inpatients

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United Kingdom

Introduction: Delirium is a complex neurological condition estimated to affect 30% of medical inpatients over 65. With an associated mortality rate of up to 39%, delirium leads to poorer patient outcomes, increased NHS cost and care demand. Although preventable, delirium remains under-recognised delaying integrated care planning and prolonging admissions.

Aim: To evaluate diagnosis and investigation of delirium in patients aged ≥ 65 with an admission 4AT score of ≥ 4 . To improve awareness of delirium and encourage completion of a 'delirium screen' by medics. **Methods / Intervention** Identified eligible patients, defined as those ≥ 65 years with an admission 4AT score of ≥ 4 , across four downstream medical wards within University Hospital Ayr. Reviewed medical notes, assessing documentation of 'delirium' and noting time relative to admission. Additionally, evaluated completion of functional and collateral history, Adults With Incapacity, stool chart and delirium screen. Delivered staff teaching session and located posters throughout medical receiving unit. Re-collected data. Implemented focused teaching to Foundation trainees and charge nurses and created a delirium screen sticker for medical notes. Re-collected data and compared with cycles 1 and 2 to conclude project. **Results / Discussion** Following dedicated delirium teaching documentation of delirium improved from 53% to 75% on day 1 of admission yet unfortunately this improvement was not seen in cycle 3. Capacity assessments were more readily completed reflected by AWI use which improved by 3% overall. Completion of collateral history improved by 18% and functional history by 49% yet establishment of legal powers remained static around 35% suggesting increased education is required. Delirium screen completion improved from 6% to 28% however this was not felt attributable to creation of the delirium screen sticker. Stool chart completion remained suboptimal likely reflective of nursing workload and knowledge.

Conclusion: Delirium diagnosis remains delayed despite use of a validated screening tool upon admission (with 88% sensitivity) and recognition of incapacity. Teaching sessions delivered positive results yet these may have been enhanced if delivered as part of a programme involving the MDT. An electronic delirium screen would be better used by staff.

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POSTER 6

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Psychometric Properties of Clinician-Reported Outcome Measures for Delirium in People with Dementia: A COSMIN-Based Systematic Review

Johanna Christina Seiters, Vincent Molitor, Jasmin Helbach, Natascha-Elisabeth Denninger, Max Zilezinski, Falk Hoffmann, Rebecca Palm

Germany

Background/ Aim: To identify delirium in people with dementia is often a major challenge for healthcare professionals. Therefore, validated screening and diagnostic tools are needed across healthcare settings. This systematic review evaluated the measurement properties and diagnostic accuracy of clinician-reported outcome measures (ClinROMs) used to identify delirium superimposed on dementia (DSD).

Methods: MEDLINE, CINAHL, PsycInfo and Embase were searched from inception to 17 February 2026. Studies focusing on the development, validation (including diagnostic accuracy) or cross-cultural adaptation of ClinROMs were included if at least one of the nine COSMIN measurement properties was reported. Measurement properties and certainty of evidence were evaluated in accordance with the COSMIN framework. Methodological quality was determined using the COSMIN Risk of Bias checklist.

Results: A total of 35,193 records were screened, of which 16 studies evaluating 13 ClinROMs were included. Sample sizes ranged from 26 to 141 participants, and most studies were conducted in hospital settings. All ClinROMs assessed delirium, including one specifically developed for DSD, and comprised 3-16 items. Four of the nine COSMIN measurement properties were evaluated, with criterion validity being the most frequently reported (n=16). High-quality evidence across multiple measurement properties was lacking for all ClinROMs. Consequently, according to COSMIN standards, none can currently be recommended for assessing DSD.

Conclusions: Overall, evidence on ClinROM measurement properties and diagnostic accuracy for DSD is limited. None of the 13 identified instruments can be recommended according to COSMIN standards. Further methodologically rigorous studies following COSMIN guidelines and assessing key properties (reliability, validity, responsiveness) are needed.

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Delirium Superimposed on Dementia in Nursing Homes: Prevalence, Incidence, and Prognosis – A Prospective Multicentre Cohort Study Protocol

Vincent Molitor, Johanna Seiters, Nina Willerscheidt, Burkhard Haastert, Imke Aits, Tim Stuckenschneider, Falk Hoffmann, Michael Freitag, Tania Zieschang & Rebecca Palm

Germany

Background /Aims: People living with dementia are at increased risk of delirium (delirium superimposed on dementia, DSD). However, reliable data on prevalence, incidence, risk factors, and clinical course in nursing home residents remain limited due to heterogeneous study designs. This study aims to generate robust epidemiological and clinical evidence on DSD in nursing homes.

Methods: This prospective multicentre cohort study will include approximately 300 residents with dementia from about 20 nursing homes. Participants without DSD at baseline will undergo weekly delirium screening for six months using the Informant Assessment of Geriatric Delirium, administered by trained staff. In cases of positive screening, delirium severity and motor subtype will be assessed. Cognitive and functional status and mobility will be assessed at baseline and after six months; precipitating factors (e.g. infections, hospitalizations) will also be monitored weekly; cognitive and functional status and mortality will be reassessed three months after completion of screening. Mortality will be recorded continuously throughout the study. Nursing and medical care processes related to delirium will be described systematically. Delirium prevalence and incidence will be estimated and potential risk factors will be investigated using mixed logistic and frailty Cox regression models considering cluster adjustment. Expected Results: The study will provide prospective data on the occurrence and course of DSD and improve understanding of risk profiles and care processes, supporting evidence-based prevention and management in nursing homes.

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POSTER 8

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Measurement properties of delirium tools in pediatric intensive care: a systematic review

M. Zilezinski, N.-E. Denninger, M. Müller, A. Tannen, J. Kottner

Germany

Background: Delirium affects about one-third of critically ill children in pediatric intensive care units and is associated with longer ICU stays, prolonged ventilation, mortality, and reduced post-discharge quality of life. To detect this condition early at the bedside, screening tools are required. Several tools exist, but evidence on their measurement properties remains fragmented and it is unknown which tool performs best.

Methods: A systematic review was conducted to evaluate the measurement properties of pediatric delirium screening tools in acute care. MEDLINE, EMBASE, PsycINFO, CINAHL, the Cochrane Library, and Web of Science were searched without language or date restrictions. Two reviewers independently screened studies, extracted data, and assessed risk of bias using adapted COSMIN methods; diagnostic accuracy studies were additionally assessed using QUADAS-2. Evidence was synthesised using an adapted GRADE approach.

Results: From 8,378 records, 41 studies were included, covering 15 language versions of six tools: CAPD, psCAM-ICU, pCAM-ICU, SOS-PD, PEDS, and CDAS. CAPD had the largest evidence base, followed by CAM-based tools. High-certainty evidence supported criterion validity for CAPD, CAM-based tools, with moderate-certainty evidence for their reliability. SOS-PD showed moderate-certainty evidence for criterion validity and high-certainty evidence for convergent validity and reliability. Evidence for CDAS and PEDS was limited to single studies. Across tools, evidence mainly addressed criterion validity and inter-rater reliability.

Conclusions: Most studies investigated the performance of the CAPD. In comparison, the SOS-PD currently performs the best. Future studies should address cross-cultural validity, measurement error, reliability in routine care, and subgroup performance.

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Delirium frequency and outcomes in older inpatients

Yamini Ajmera, Karandeep Paul, Maroof Ahmad Khan, Bharti Kumari, Nand Kumar, Prasun Chatterjee, Aparajit Ballav Dey, Avinash Chakrawarty

India

Background: Delirium is a common complication in hospitalized older adults with multifactorial etiology and poor health outcomes.

Aim: To determine the frequency and predictors of delirium and its short-term and long-term outcomes in hospitalized older adults.

Methods: A prospective observational study was performed in patients aged ≥ 60 years consecutively admitted to geriatric ward. Potential risk factors were assessed within 24 hours of hospital admission. Delirium screening was performed on admission and daily thereafter throughout the hospital stay using Confusion Assessment Method (CAM). Patients were followed up at 1-year post-discharge.

Results: The study included 200 patients with mean age 73.1 ± 8.83 years. Incidence and prevalence rate of delirium were 5% and 20% respectively. Multivariable regression analysis revealed emergency admission (OR=5.12 (1.94–13.57), $p=0.001$), functional dependency (Katz index of Independence in Activities of Daily Living (Katz-ADL) score <5) 2 weeks before admission (OR= 3.08 (1.30–7.33), $p=0.011$) and more psychopathological symptoms (higher Brief Psychiatric Rating Scale (BPRS) total score) (OR=1.12 (1.06–1.18), $p=0.001$) to be independently associated with delirium. Patients in delirium group had significantly high in-hospital mortality (OR= 5.02 (2.12–11.8), $p=0.001$) and post-discharge mortality (HR= 2.02 (1.13–3.61), $p=0.017$) and functional dependency (Katz-ADL score <5) (OR= 5.45 (1.49–19.31), $p=0.01$) at 1-year follow up.

Conclusion: Delirium is quite frequent in geriatric inpatients and is associated with high in-hospital and postdischarge mortality risk and long-term functional dependency. Emergency admission, pre-hospitalization functional dependency, and more general psychopathological symptoms are independently associated factors. Hence, earliest identification and treatment with early implementation of rehabilitation services is warranted.

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Serum leptin and delirium

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India

Background: Delirium is a complex, reversible neuropsychiatric disorder with multifactorial etiology and numerous knowledge gaps in the pathogenesis.

Aim: This study aim to establish an association between leptin levels and delirium in patients aged ≥ 60 years admitted under geriatric medicine department of a tertiary care hospital.

Methods: A prospective observational study was conducted in consecutively admitted patients to geriatric ward. Patients were assessed for delirium within 24 hours of admission and daily thereafter till the time they were discharged from the hospital or died using CAM or CAM-ICU with subsequent division into Delirium and Non-Delirium group. Serum leptin levels were measured using enzyme-linked immunosorbent assay.

Results: 200 patients were recruited in the study. The mean age of participants was found to be 73.1 ± 8.8 years. Prevalence rates of delirium at the time of admission and incidence rates during hospital stay were found to be 20% and 5% respectively. The occurrence of delirium was also found to be significantly associated with mortality (32.5% vs 8.7%, $p=0.001$). Serum leptin levels were found to be significantly lower in patients with delirium (2.58 ± 1.01 ng/mL vs 10.72 ± 1.46 ng/mL, $p=0.03$). Multivariable regression analysis revealed delirium to significantly correlate positively with age (OR: 1.63 (1.07-2.47), $p=0.021$) and negatively with leptin levels (OR: 0.94 (0.90-0.99), $p=0.018$).

Conclusion: Delirium is a frequently occurring condition in hospitalized older adults with high mortality rates. Leptin might serve as a potential predictor of delirium owing to its probable role in the pathophysiological processes of delirium.

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Admission risk factors for incident delirium**Tru Byrnes**

United States

Delirium is a serious complication in hospitalized older adults, making early risk identification essential. This study examined admission-based delirium risk factors, including electronic Frailty Index (eFI) categories, among medical and surgical older adults. This retrospective analysis included 608 hospitalized adults aged 65 years and older without delirium at admission. Patients were stratified by as medical or surgical. Delirium was identified using CAM documentation or physician documentation in the electronic health record. Admission risk factors and eFI categories were examined using logistic regression. Least absolute shrinkage and selection operator regression with 10-fold cross-validation supported variable selection. Incident delirium occurred in 44 patients (7%): 22 surgical patients (6.5%) and 22 medical patients (8.2%). eFI categories were not significantly associated with incident delirium in either admission population, likely reflecting the small number of patients categorized as frail and the high proportion with incalculable scores. Risk factors differed by admission population. In surgical patients, dementia, impaired mobility, alcohol abuse, and anticholinergic medication were associated with delirium. In medical patients, older age, dementia, traumatic brain injury, impaired mobility, and history of stroke or transient ischemic attack demonstrated associations with delirium. LASSO regression identified dementia, impaired mobility, and anticholinergic medication used in surgical patients and age, dementia, admission for stroke, and impaired mobility in medical patients. Delirium risk factors differed between medical and surgical older adults, supporting population-specific early identification. Although eFI categories were not predictive, dementia and impaired mobility were consistent risk factors and may guide development of a practical bedside risk stratification model.

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POSTER 16

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Alpha-2-adrenergic receptor agonists for the prevention of delirium and cognitive decline after open heart surgery (ALPHA2PREVENT): a randomised controlled trial

Thea Berntsen, Bjørn Erik Neerland, Torgeir Bruun Wyller

Norway

Background/Aims: Delirium has both acute and long-term consequences, and preventing it is important. Cardiac surgery patients are particularly susceptible to delirium and have therefore been the focus of several studies on delirium prevention. Dexmedetomidine, an alpha-2-adrenergic agonist, has shown promise, but studies have yielded conflicting results and considerable heterogeneity, leaving many questions unanswered. Fewer have examined clonidine, another alpha-2-adrenergic agonist with similar properties to dexmedetomidine. We aimed to assess the effectiveness of both dexmedetomidine and clonidine in preventing delirium and cognitive decline in cardiac surgery patients.

Methods: We conducted a randomized, double-blind trial, enrolling patients ≥ 70 years accepted for cardiac surgery with cardiopulmonary bypass at five medical centres in Norway. Patients were assigned in a 1:1:1 ratio to receive dexmedetomidine, clonidine or placebo, administered as an intravenous infusion from the start of cardiopulmonary bypass and for maximum 24 hours. The primary outcome was the seven-day cumulative incidence of postoperative delirium. Secondary outcomes included biomarkers and change in cognitive function, frailty status and patient rated health after one and six months.

Results: Inclusion ended on 30 June 2026, with a total of 766 patients having received the trial drug. Among the first 600 patients, mean age was 74 and 80 % were male. The final follow-up visits will be conducted during December 2026.

Conclusions: This trial will contribute to the evidence on the prophylactic effects of dexmedetomidine and clonidine on delirium and cognitive decline.

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The Impact of Dysphagia on Post-Stroke Delirium: A Post-Hoc Analysis Using Routine Data

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Switzerland · Germany · Austria

Background: Stroke incidence has risen significantly over the past three decades. Stroke patients are at increased risk of developing dysphagia and post-stroke delirium (PSD), common complications associated with poorer outcomes and higher care needs. Furthermore, stroke-related dysphagia appears to be an independent risk factor for PSD. This study aims to analyse dysphagia's effect on PSD.

Methods: This study was performed as a post-hoc analysis of an observational study in a Swiss stroke centre. The Confusion Assessment Method for the Intensive Care Unit was used to screen for PSD. Dysphagia was screened using the Gugging Swallowing Screen (GUSS), with scores of 20 indicating no dysphagia and ≤ 19 indicating dysphagia. Datasets are evaluated descriptively, before regression analysis and odds ratios (OR) for covariates were calculated.

Results: Across the entire cohort of patients ($n=199$), the prevalence of dysphagia was 24.1% ($n=48$) and the prevalence of PSD was 22.1% ($n=44$), while 47.9% ($n=23$) suffered from both. Dysphagia was in the regression analyses significantly associated with PSD, with an OR of 0.9. Meaning that an each one-point increase in GUSS is associated with a 10% decrease in the odds of PSD.

Conclusions: After adjusting for six established risk factors, dysphagia appeared to be an independent risk factor for PSD. Furthermore, dysphagia may serve as an early clinical marker for an increased risk of delirium after a stroke. This highlights the need for close monitoring and further research into potential mechanisms, including malnutrition, dehydration, infection, delirium treatment, and impaired neural networks shared by swallowing, attention, and cognition.

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Delirium and the subthreshold model of embodied consciousness

Eamonn Eeles, Phillip Karparti, Julian Ray, David Duc Tran

Australia · United Kingdom

Background: We propose a threshold-based model of embodied consciousness in which conscious function arises from the joint expression of Access-consciousness (A) and Phenomenal-consciousness (P).

Methods: Using theoretically derived thresholds we operationalized A and P through measurable behavioural proxies.

Results: Delirium emerges as a two-determinant failure—simultaneous disturbance of A and P despite preserved LoC—distinguishing it from coma (loss of LoC) and from isolated disruptions of A or P. The model predicts that subthreshold A or subthreshold P each increases vulnerability to delirium.

Conclusions: This threshold-based model provides a coherent mechanistic account of how A- and P-consciousness interact to generate embodied consciousness and offers a unified approach for interpreting disturbances across clinical states. By identifying subthreshold A or P as prodromal markers of delirium, the framework supports earlier detection, improved diagnostic differentiation, and a clearer conceptualization of delirium as a state-level disruption of embodied consciousness rather than a solely attentional or global cognitive disorder.

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A Preliminary Evaluation of a Novel Consciousness Assessment Tool in a Simulated Healthy Adult Population

Eamonn Eeles, Julian Ray, Tim Miller

Australia • United Kingdom

Background: Assessment of consciousness, including its disturbance as a key domain of delirium, is frequently superficial in routine clinical practice. We have previously developed a clinical instrument that aims to quantify experiential consciousness. However, this instrument may be criticised for either inadvertently capturing other cognitive domains or for lacking sufficient complexity. In the present study, we evaluated a novel experiential consciousness tool and compared its measurement properties with those of the 4AT in a simulated patient paradigm.

Methods: A simulated dataset representing 100 healthy adults (including older adults) was generated to approximate expected response patterns. Items were scored dichotomously. Analyses included item difficulty (proportion correct), variance, item-total correlations, and exploratory factor analysis (EFA). Factorability was assessed using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity. Item difficulty distributions were compared with a simulated sample of 4AT responses using parametric and non-parametric methods.

Results: EFA revealed no structure corresponding to established cognitive domains. KMO was low (0.48) and Bartlett's test was non-significant ($p = 0.99$), indicating that factor analysis was not appropriate. Mean item difficulty did not differ significantly between the consciousness tool and the 4AT ($p > 0.3$), although the consciousness tool showed greater dispersion and more extreme ceiling effects.

Conclusions: The Consciousness Tool does not appear to load within established cognitive domains and was of similar difficulty levels to the 4AT. While not proving that phenomenal consciousness is being assessed, these findings challenge the notion that such measures implicitly evaluate only standard cognitive functions or are of limited clinical value. Further validation in clinical populations is anticipated.

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Delirium resources for informal carers

Jenni Steffen, Michelle Bissett, Christina Aggar, Carla Sunner, Alison Craswell, Heidi Lindroth, Emma Vardy, Claire Pryor, Priyanka Shrestha, Tanya Bodnarchuk

Australia • United States • United Kingdom • Canada

Aim: To identify and map peer-reviewed digital resources designed to support carers and the general public in the prevention, detection, and management of delirium in community-dwelling older adults.

Design: Scoping review

Methods: The review followed Joanna Briggs Institute methodology. Eligible studies evaluated peer-reviewed digital delirium resources designed for informal carers of community-dwelling older adults. Methodological quality was assessed using the Mixed Methods Appraisal Tool.

Results: From 5,140 records, two studies met the inclusion criteria, both conducted in Canada. One evaluated 106 publicly accessible delirium websites and found that most exceeded recommended reading levels, lacked transparency, and contained inaccurate information. The second evaluated a co-designed e-learning resource and reported improved user acceptability and delirium knowledge.

Conclusion: Peer-reviewed evidence evaluating digital delirium resources for carers of community-dwelling older adults is extremely limited. Increasing global reliance on family carers highlights the need for internationally relevant and evaluated digital resources that improve access to delirium education, support earlier recognition and prevention, and facilitate culturally responsive, scalable interventions.

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Medication guidance for delirium superimposed on dementia

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Austria · Iceland · United Kingdom

Background/Aims: The paucity of clinical consensus guidelines and associated high-quality evidence make pharmacological management of delirium superimposed on dementia (DSD) challenging. Hence the current study aims to develop consensus guidelines on medication-related risks in the treatment, cause, and prevention of DSD using the stepwise approach of the ACcurate CONsensus Reporting Document (ACCORD) in combination with the RAND/UCLA Appropriateness Method.

Methods: A multi-method study in three phases: [1] a PRISMA reported systematic review to collate medication-related evidence on DSD; [2] COREQ checklist guided online focus groups with purposively sampled Austrian and Icelandic interdisciplinary healthcare providers to evaluate clinical relevance, completeness and applicability of the evidence to daily practice; and [3] a future CREDES checklist guided Delphi study with international delirium experts to achieve consensus.

Results: The systematic review (n=49 publications) identified key medication-related domains, including dosage, pharmacological properties, and special considerations for antipsychotics, cholinesterase inhibitors, opioids and benzodiazepines in DSD. Focus group participants (n=24) highlighted gaps between available evidence and clinical applicability, recommending incorporation of practical prescribing information such as drug-specific dosing, monitoring parameters, drug interactions, and safety warnings. Participants further emphasised the need for clearer, simplified formats to facilitate bedside use. These findings have refined the evidence and informed the iterative development of Delphi statements which will be distributed to approximately 150 international delirium experts for assessment.

Conclusions: Combining evidence synthesis, qualitative expert input and Delphi methodology provides a robust pathway to consensus guideline development for DSD, therefore improving prescribing practices and brain health in line with WHO dementia priorities.

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Empowering Nurses in Delirium Care: The Development of "DelirXR"

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Background: Nurses play a key role in early delirium detection and prevention, yet recognizing subtle symptoms remains a clinical challenge. To bridge the gap between theory and bedside practice, nursing-led initiatives are vital in designing target-audience-specific educational tools.

Objectives: Innovation Management at the University Hospital Vienna transformed the initial idea of DelirXR into an immersive virtual reality (VR) training tool for nurses, in collaboration with nursing experts. The tool aims to enhance delirium assessment and acute care while fostering a humanistic, person-centered approach.

Methods: Using a co-creation approach with VR developers and innovators, nursing experts designed an authentic clinical simulation. The VR scenario includes both a caregiver and a patient perspective to foster empathy, alongside various training modes covering both hyperactive and hypoactive delirium presentations.

Project Description: Within the immersive environment, nursing staff are guided through realistic patient encounters. Users observe and care for virtual patients, perform a structured Nu-DESC assessment, answer clinical knowledge prompts, and document their findings. Based on this assessment, they make immediate clinical decisions and select non-pharmacological preventive interventions. Tailored, real-time feedback and a reflection component are integrated to reinforce learning transfer.

Conclusion & Outlook: DelirXR demonstrates how nursing expertise can drive digital innovation in clinical education. By translating complex nursing assessments into an immersive experience, the tool strengthens nurses' clinical confidence and competence. Following this initial development phase, DelirXR will undergo systematic clinical testing and evaluation among acute care nursing staff to measure its usability and educational impact.

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Substance Use May - More Than Any Other Psychosocial Factor - Predict the Risk of Delirium After Allogeneic Stem Cell Transplantation

Pauline Matuschke, Fabienne Hoogendoorn, Barbara van Munster, Carin Hazenberg, Petra Fieten, Marcel Nijland, Anouschka Biswana, Gerwin Huls, Emanuele Ammatuna, Linde Morsink, Monika Trzpis

Netherlands

Background: Delirium is a common complication after allogeneic stem cell transplantation (alloHSCT), making its early prevention an important facilitator for better health outcomes. A potential tool for timely identification of patients at high risk of delirium before alloHSCT may be the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT). The pre-transplantation SIPAT screening contains information on several psychosocial domains that are well-established risk factors for delirium, including illness management capability, social network, psychopathology and substance use. We aimed to assess the association between delirium and the SIPAT score.

Methods: In this retrospective cohort study, we included hematological patients aged ≥ 50 years who were treated with alloHSCT at the University Medical Center Groningen, the Netherlands. Presence of delirium during alloHSCT admission was assessed using validated chart review. The association between delirium and SIPAT score was assessed with logistic regression models, adjusting for relevant confounders both at baseline and during admission.

Results: Out of 194 included cases, 30 (15%) experienced delirium. The 'substance use' domain was significantly associated with delirium after adjusting for age and diagnosis (OR 2.59, 95% CI: 1.07–6.28, $p = 0.035$). Additional adjustment for HLA-mismatched transplantation and opioid and/or corticosteroid use attenuated this association (OR 2.01, 95% CI: 0.83 – 4.86, $p = 0.121$). Neither the total SIPAT score nor the domains of 'illness management', 'social network' and 'psychopathology' showed significant association with delirium.

Conclusions: Our findings suggest that screening for substance abuse before treatment initiation may help identify patients at increased risk of delirium, enabling early preventive interventions.

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When the Brain Falter: Delirium as a Frequent, Multifactorial and Consequential Complication in Patients Undergoing Allogeneic Hematopoietic Stem Cell Transplantation for Hematological Diseases

Fabienne Hoogendoorn, Pauline Matuschke, Barbara van Munster, Carin Hazenberg, Marcel Nijland, Anouschka Biswana, Gerwin Huls, Emanuele Ammatuna, Linde Morsink, Monika Trzpis

Netherlands

Background: Delirium is a frequent complication following allogeneic hematopoietic stem cell transplantation (alloHSCT), especially in older patients. We aimed to determine the prevalence and associated risk factors of delirium after alloHSCT for hematological diseases.

Methods: This retrospective single-center cohort study included patients aged ≥ 50 years, who underwent alloHSCT for hematological diseases at the University Medical Centre Groningen between 2018 and 2026. Delirium was assessed using validated chart review based on the DSM-5 criteria. Subsyndromal delirium (SSD) was defined as the presence of < 3 DSM-5 criteria. Prevalence, risk factors and long-term outcomes associated with delirium were analyzed.

Results: In the cohort of 560 patients, delirium and SSD occurred in 15.5% and 4.3% of patients, respectively. Delirium was independently associated with higher age, reduced functional status, higher number of treatment-related complications, and increased medication use (p -value $< .05$ for all). Delirium was significantly associated with prolonged hospitalization (OR = 1.44, 95% CI [1.29 - 1.60]), more frequent ICU admission (OR = 9.73, 95% CI [4.88 - 19.38]), increased readmissions (OR = 1.32, 95% CI [1.16 - 1.51]), and higher mortality risk during (OR = 20.09, 95% CI [8.21 - 49.09]) and after hospitalization (OR = 2.02, 95% CI [1.18 - 3.44]).

Conclusions: Delirium has a relatively high prevalence in alloHSCT patients and reflects a state of clinical vulnerability and complex post-transplant recovery. Given its frequent association with adverse outcomes, our findings highlight the need for systematic awareness, early detection that would enable timely prevention, and risk stratification in clinical care.

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Delirium in Hospitalized Patients Undergoing Autologous Stem Cell Transplantation is a Highly Prevalent and Overlooked Syndrome with Significant Clinical Consequences

Fabienne Hoogendoorn, Marrit Bijlsma, Barbara van Munster, Carin Hazenberg, Marcel Nijland, Anouschka Biswana, Gerwin Huls, Emanuele Ammatuna, Linde Morsink, Monika Trzpis

Netherlands

Background: Autologous hematopoietic stem cell transplantation (autoHSCT) is an intensive treatment involving high-dose chemotherapy conditioning followed by reinfusion of autologous stem cells to restore haematopoiesis. The combination of cytotoxic therapy, prolonged cytopenias, infection risk, metabolic disturbances, and complex symptom burden creates a biologically plausible setting for delirium. We aimed to determine the prevalence of delirium and subsyndromal delirium (SSD), time to delirium onset, associated risk factors, and clinical outcomes following autoHSCT.

Methods: This retrospective cross-sectional cohort study included patients aged ≥ 50 years who underwent autoHSCT for haematological malignancies at the University Medical Centre Groningen, The Netherlands, between 2018 and 2026. Delirium and SSD were retrospectively identified using validated chart-based method based on DSM-5 criteria. Delirium prevalence, patient- and treatment-related factors, and clinical outcomes were analysed using descriptive analysis and regression analysis.

Results: Among 352 patients, 47 (13.4%) developed delirium and 13 (3.7%) developed SSD. The mean time to delirium onset was 8.9 days after autoHSCT. Factors significantly associated with delirium included older age, lower ADL function, opioid use, elevated C-reactive protein levels, and BEAM conditioning therapy. Delirium was significantly associated with increased complication rates, prolonged hospitalization, higher intensive care unit admission rates, and increased mortality.

Conclusion: Delirium is a frequent and clinically significant complication following autoHSCT, associated with substantial morbidity and mortality. Knowledge on patient- and treatment-related risk factors enables targeted risk stratification. Our findings highlight the importance of systematic delirium screening to support timely implementation of preventive management in this high-risk population.

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Developing an Initial Programme Theory for an APN-Led Delirium Management Programme: A Realist Evaluation Study

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Austria · Switzerland · Germany

Background/Aims: The Advanced Practice Nurse (APN)-led Delirium Management Programme (DMP) at University Hospital Basel (Switzerland) is a long-standing, multicomponent intervention. Previous evaluations focused on individual components, leaving unclear how, why, for whom, and under which conditions the programme works. Using a realist evaluation approach, this study aimed to develop an initial programme theory (IPT) as Context– Mechanism–Outcome (CMO) configurations to guide empirical testing.

Methods: The theory-building phase was conducted as a methodologically open, iterative, and retroductive analytic process. Data sources included programme documents, 12 interviews with nurses, programme and contextual knowledge held by research group members, and ward-level quantitative routine data on delirium screening performance and adherence to the assessment algorithm. In research group workshops, these data were synthesised to refine CMO-configurations and to construct the IPT.

Results: Facilitating contexts included institutional commitment to programme resources (programme leadership, education, consultation, standards, monitoring) and supportive leadership teams fostering a person-centred workplace. Adverse contexts were resource constraints, workload, staff turnover, and limited interprofessional commitment. These contexts activate mechanisms such as organisational legitimacy, recognition of expertise, clinical autonomy, standard-induced decisional certainty, proxy legitimacy in interprofessional collaboration, professional pride, and low- threshold support ensuring psychological safety. Nurses' self-efficacy emerged as the central intermediate outcome, driven by knowledge, clinical sensitisation, and relief through support. This enables adherence to the delirium management standard, measurable via screening, assessment, documentation, escalation, and non-pharmacological interventions.

Conclusions: The IPT provides an explanatory framework for understanding how context and resources shape DMP functioning and serves as the basis for iterative empirical refinement throughout the evaluation.

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Looking Beyond Parkinson's Disease: Hallucinations and Delusions as Markers of Delirium

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Background: Delirium is common in Parkinson's disease (PD) and increases the risk of dementia, institutionalisation and mortality. Diagnosis is challenging because hallucinations and delusions occur in both conditions. This study characterised hallucinations and delusions experienced in inpatients with PD with and without delirium.

Methods: Delirium was assessed daily using standardised Diagnostic and Statistical Manual of Mental Disorders 5th Edition criteria, comprising bedside tests, clinical observations and collateral history. Hallucinations and delusions were identified from the North-East Visual Hallucinations Index, participants, informants and researcher observations, then categorised using predefined definitions. Diagnostic accuracy was assessed using receiver operating characteristic analysis.

Results: 115 participants (200 admissions) were included; 66.1% experienced delirium. Compared with non-delirium admissions, delirium admissions had more frequent hallucinations (73.2% vs. 44.2%, $p < 0.001$) and delusions (61.8% vs. 16.9%). Complex visual (58.5% vs. 14.3%), auditory (18.7% vs. 5.2%), and panoramic hallucinations (10.6% vs. 0%), along with paranoid (23.6% vs 10.4%), confabulatory (22.8% vs 2.6%) and location (17.9% vs 1.3%) delusions were more common in delirium ($p < 0.05$ for all). Illusions (29.3% vs. 22.1%), shadows (20.3% vs. 18.2%) and a sense of presence (14.6% vs. 18.2%) were common to both groups, with no significant difference. Complex visual hallucinations had the highest diagnostic accuracy ($AUC = 0.72$), while delusions performed the best overall ($AUC = 0.73$). Combining both improved discrimination ($AUC = 0.80$, specificity 98.4%, $p < 0.001$).

Conclusions: Hallucinations and delusions should not be attributed to PD alone. Complex visual hallucinations and delusions, particularly when occurring together, should prompt a delirium assessment. This may improve recognition in this high-risk population.

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Delirium and BPSD in Geriatric Acute Care: A Staff Needs Assessment for APN-Led Guidance and Coaching

Olga Muser, Céline Heitzmann

Switzerland

Background/Aims: Delirium and Behavioral and Psychological Symptoms of Dementia (BPSD) are common and challenging conditions in geriatric acute care. Nursing staff play a crucial role in the recognition, assessment, and management of these syndromes, yet educational interventions are often developed without systematic competency assessment. This project aimed to assess knowledge, confidence, and perceived educational needs related to delirium and BPSD among registered nurses, licensed practical nurses, and nursing aides to inform and shape targeted bedside teaching initiatives.

Methods: A cross-sectional survey was conducted among the nursing staff of a geriatric acute care hospital. Out of n = 371 eligible staff members, n = 91 completed the questionnaire (24.5% response rate). Quantitative data were analyzed descriptively using R across professional roles. Qualitative free-text responses were evaluated using Rapid Assessment Procedure (RAP) sheets to efficiently summarize recurring strengths, knowledge gaps, and educational preferences.

Results: The descriptive analysis revealed distinct areas of confidence alongside significant educational needs. While 62.0% of respondents felt secure in recognizing delirium, only 40.7% reported the same level of confidence for BPSD. Notable knowledge gaps emerged: 29.8% felt insecure in differentiating between BPSD and delirium, and only 29.6% felt well-prepared to handle aggressive or agitated patient behaviors. Regarding APN-led educational delivery, the majority preferred flexible bedside teaching, either on-demand (40.0%) or scheduled monthly (32.0%).

Conclusions: Understanding staff learning needs is essential for developing effective, practice-oriented educational interventions. By translating staff needs into targeted APN education, this project bridges critical knowledge gaps to enhance patient safety in acute geriatric care.

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Medication use and acutely admitted older patients with delirium

Anne Katrine Bergland, Rune Tord Wathne Oftedal, Torunn Gudmestad Øvrebø, Dag Aarsland, Mathias Nikolai Petersen Hella, Ragnhild Djønne Østerhus

Norway · United Kingdom

Background/Aim: Medication use is a known precipitating factor associated with delirium. The aim of this study is to explore the possible association of medication use and delirium in older patients in the emergency department (ED).

Methods: This cohort study was conducted in the ED during a period of five weekdays and four nights. Patients ≥ 65 years who were acutely admitted to the ED were included in the study. A diagnosis of delirium was made according to The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition's criteria (DSM-V) by retrospectively reviewing the electronic health record. Medication data were extracted from the electronic medication charting system and the patient's national Summary Care Record, subsequently reviewed and validated by study personnel. Descriptive statistics were used to describe the cohort, and univariable logistic regression analyses were used to explore the possible association of medication use and delirium.

Results: A total of 233 patients were included. Median age 77 years (IQR 13). Regarding delirium, 13% ($n = 30$) patients fulfilled DSM-V criteria in the ED. Altogether 190 patients had polypharmacy (≥ 5 medications) and 118 hyper-polypharmacy (≥ 10 medication). Of the ten medication groups (Benzodiazepines and z-hypnotics, Antipsychotics, Opioids, Antidepressants, Anticholinergics, Antiepileptics, Diuretics, Alfa inhibitors, Antihistamines, Medication for overactive bladder, Peroral antidiabetics, Medication with anticholinergic effects) analysed, opioids and anticholinergic medications were found to be statistically significantly associated with delirium in older patients in the ED.

Conclusions: Use of opioids and anticholinergics are possibly associated with delirium in acutely admitted patients. Larger cohorts are warranted.

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Delirium is Associated with Severe Systemic Inflammation and Altered Hematopoietic Recovery in Hematological Patients Undergoing Allogeneic Hematopoietic Stem Cell Transplantation

Fabienne Hoogendoorn, Pauline Matuschke, Barbara van Munster, Carin Hazenberg, Marcel Nijland, Anouschka Biswana, Gerwin Huls, Emanuele Ammatuna, Linde Morsink, Monika Trzpis

Netherlands

Background: Allogeneic hematopoietic stem cell transplantation (alloHSCT) induces inflammatory responses and hematopoietic reconstitution, which may trigger delirium. We investigated the association between biomarkers reflecting these processes and delirium throughout the alloHSCT trajectory.

Methods: This retrospective study included patients aged ≥ 50 years who underwent alloHSCT for hematological diseases at the University Medical Centre Groningen (the Netherlands), between 2018 and 2026. Delirium was identified by DSM-5-based chart review. Inflammatory and hematopoietic biomarkers (CRP, blood cell counts) and blood cell ratios were compared between patients with and without delirium before, during, and after delirium onset, with corresponding time points in the non-delirium group based on the mean time between alloHSCT and delirium onset (14 days). Longitudinal changes, adjusted for relevant confounders, were analyzed using linear mixed-effects models.

Results: Among 560 patients, 15.5% developed delirium. CRP-levels were significantly higher in the delirium group throughout the alloHSCT trajectory than in the non-delirium group. Longitudinal analyses showed that CRP-levels followed similar patterns over time in both groups. Before delirium onset, the delirium group had lower hemoglobin, platelet, and leukocyte counts, as well as lower platelet-to-white blood cell ratio (PWR) than the non-delirium group. During delirium, lower platelet counts and PWR persisted. At 28 days after alloHSCT, patients with delirium continued to have lower hemoglobin, platelet counts, and PWR, while lymphocyte counts were higher. The hemoglobin, platelet counts, leukocyte counts, and PWR trajectories were significantly different between patients with and without delirium.

Conclusions: Delirium following alloHSCT is associated with persistently elevated systemic inflammation and altered hematopoietic recovery.

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Engaging healthcare workers to inform a systems engineering study of delirium care in emergency departments

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United Kingdom

Background: Delirium is common among hospitalised patients and is particularly challenging to prevent, recognise and manage in emergency departments (EDs), where busy and disorientating environments and competing clinical priorities can hinder optimal care. As part of a larger programme of work using the Systems Engineering Initiative for Patient Safety (SEIPS) framework to improve ED delirium care, we conducted stakeholder engagement workshops in two UK EDs.

Aims: To engage busy healthcare workers and draw on their experiences to inform the conduct of a SEIPS-based study of delirium care.

Methods: Flexible lunchtime drop-in workshops for ED staff at two hospitals to maximise accessibility and engagement. Activities using patient vignettes to explore and map the 'people' and 'tasks' involved in delirium care. Facilitator-prompted discussion about systems influences on delirium care and opportunities for improvement.

Results: Workshops engaged over 80 staff from a range of clinical and non-clinical roles. Participants identified and mapped diverse and interdependent teams, roles and tasks involved in delivering delirium care across the patient pathway, including often-overlooked organisational and coordination work alongside direct clinical care. Discussions generated further insights into bottlenecks and high-risk points in the pathway, examples of effective multidisciplinary collaboration and areas for improvement. The workshops informed purposive sampling, refinement of interview topic guides and recruitment to subsequent qualitative interviews.

Conclusions: Flexibly designed workshops successfully engaged a diverse, multidisciplinary workforce and revealed the breadth and complexity of the people, tasks, and processes underpinning delirium care, reinforcing the value of a systems engineering approach for understanding and improving care.

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Supporting Hospital Staff in Managing Challenging (Responsive) Behaviours in Dementia and Delirium Care

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Background/Aims: The growing presence of people with dementia in acute care highlights the need for effective approaches to managing challenging (responsive) behaviours. These behaviours may also occur in delirium, affecting patient safety. The Project Skills4Dem aims to develop and evaluate a digital learning and decision support system to strengthen the competencies of hospital staff, particularly nurses, in managing challenging (responsive) behaviours.

Methods: The software company Eurokey is developing a multilingual digital learning and decision support system comprising ten concise, practice-oriented learning modules and a mobile application providing just-in-time support in challenging clinical situations. The iso-institute develops the educational content based on the best available evidence using competency-based instructional design principles. The iso-institute is also responsible for the scientific evaluation of the development, implementation, and transfer phases.

Expected Results The project will deliver a scientifically developed and practice-oriented digital learning and decision support system for the acute care. The prototype learning modules have been positively evaluated by external experts regarding scientific quality, clinical relevance, and instructional design. The next project phase will focus on developing and pilot-testing the mobile application. The evaluation is expected to demonstrate high usability and acceptance and to improve staff confidence in managing challenging (responsive) behaviours.

Conclusions: Skills4Dem aims to support hospital staff, particularly nurses, by providing an innovative digital learning and decision support system for the management of challenging (responsive) behaviours in dementia and delirium care. By strengthening competencies and decision-making in complex care situations, the project seeks to reduce staff burden and improve patient safety.

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Source-localised EEG in hospitalised patients shows brain-wide slowing and reduced network integration during delirium

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Netherlands · Belgium

Background: Delirium is hypothesised to be a disconnection syndrome, but the spatial extent and topological organisation of the underlying disruption are not fully characterised.

Aim: To characterise regional spectral and functional EEG features and global network organisation in delirium, using source-reconstructed high-density EEG.

Methods: Resting-state 64-channel EEG was recorded in 81 hospitalised patients aged ≥ 50 years (40 delirious, 41 non-delirious) across three Dutch sites. LCMV beamforming reconstructed activity in 68 Desikan–Killiany regions. Peak frequency, relative power, phase lag index (PLI) and corrected amplitude envelope correlation (AECc) were compared per region (permutation-based Kruskal–Wallis, 5000 permutations, FDR-corrected). Minimum spanning trees (MSTs) were constructed per band and connectivity measure (PLI and AEC); leaf fraction, diameter, tree hierarchy and kappa were compared using ANCOVA with age and centre as covariates.

Results: The source-based EEG signature was predominantly global. Peak frequency was lower in delirium in all 68 regions. Relative power differed in all 68 regions in delta (higher), alpha and beta-1 (lower) higher delta, with no significant differences in theta band. AECc differed in 68 (delta), 62 (theta), 68 (alpha) and 68 (beta-1) regions, PLI in 39 (delta), 60 (alpha) and 14 (beta-1), with none in theta. Delirium was further associated with lower MST leaf fraction and higher diameter in theta and alpha, without differences in tree hierarchy or kappa.

Conclusions: Delirium does not result in specific regional disturbances. Slowing and reduced amplitude-based coupling span the entire cortex, and the functional network is less integrated and more path-like than in non-delirious patients.

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4AT and 3D-CAM in surgical patients

Rami Kamel Aldwikat, Emily Tomlinson, Elizabeth Manias, Patricia Nicholson

Qatar · Australia

Background: Delirium is a common and serious neurocognitive disorder among hospitalised older adults, particularly in surgical and intensive care settings, affecting up to 20% of patients in the Post-Anaesthetic Care Unit (PACU). It is associated with functional decline, prolonged hospitalisation, increased healthcare costs, and mortality. Early detection is essential; however, evidence regarding appropriate PACU screening tools and nurses' perspectives on their use remains limited.

Methods: A multi-methods study was conducted in three phases. Phase one comprised a systematic review and meta-analysis to identify accurate delirium screening tools. Phase two used a prospective cohort design to evaluate the diagnostic accuracy of the 4AT and 3D-CAM against DSM-5 criteria. Phase three used focus groups with nurses to explore the usability and clinical utility of these tools in PACU and orthopaedic wards.

Results: The systematic review identified the 4AT and 3D-CAM as the most accurate tools. In the cohort study, the 3D-CAM demonstrated 100% sensitivity and up to 93% specificity, while the 4AT demonstrated 93% sensitivity and up to 89% specificity. Nurses considered both tools clinically useful. PACU nurses preferred the 4AT because of its ease of use, whereas ward nurses favoured the 3D-CAM for its comprehensiveness. Key barriers included time constraints and tool formatting.

Conclusion: The 4AT and 3D-CAM are valid and feasible for delirium detection in surgical settings. Prioritising early PACU screening, supported by context-specific implementation and nurse-informed adaptations, may facilitate timely delirium recognition and improve care for older surgical patients.

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Nurses' perceptions and experiences of family participation in care of patients with postoperative delirium. A qualitative study

Rami K. Aldwikat, Edward Zimbudzi, Issa Almansour, Patricia Nicholson

Qatar · Australia

Background: Non-pharmacological interventions are widely recognised as best-practice approaches to delirium prevention and management. While Family involvement in patient care is increasingly recognised as an important component of patient-centered care and contribute to the delivery of non-pharmacological interventions, little is known about nurses' perceptions of family participation in the care of patients with delirium.

Aim: the study explores nurses' perceptions and experiences of family participation in the care of surgical patients with delirium.

Design: A qualitative descriptive study.

Methods: Four semi-structured focus groups were conducted with 18 registered nurses, clinical nurse specialists, and clinical nurse educators working in orthopaedic surgical wards at a tertiary hospital in XXX. Focus group discussions were audio-recorded, transcribed verbatim, and analysed using Braun and Clarke's 2006 thematic analysis approach.

Findings: Four themes emerged: (1) Challenges of caring for surgical patients with delirium, (2) Family members as essential partners in delirium care, (3) Barriers to effective family participation, and (4) The emotional and professional impact of delirium care.

Conclusion: Family members play a critical role in supporting the care of surgical patients with delirium. Their involvement may enhance communication, orientation, emotional wellbeing, and engagement in care. However, healthcare organisations must address barriers to family participation through staff education, family-centred policies, and adequate resourcing.

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Is hypernatremia associated with delirium in adult general ICU patients?

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Norway

Background: Delirium continues to be a serious problem in ICU-patients. Additionally, hypernatremia frequently complicates critical illness. We postulate that hypernatremia, by causing thirst, might be a modifiable risk factor for delirium, like other unpleasant/stressful experiences.

Aim: To investigate the possible association between hypernatremia ($s\text{-Na} \geq 146$ mmol/l) and delirium among patients treated in the general ICU at Haukeland University Hospital, Bergen, Norway.

Methods: Retrospective chart review of adult ICU patients with at least one complete delirium (CAM-ICU) score from Jan. 2017 to Dec. 2024. We expect to include 600-800 cases. Patients with acute intracranial pathology, ICU stay < 24h, and non-Norwegian residential status are excluded. We plan to fit a multivariable logistic regression model of the association between hypernatremia and the occurrence of delirium, adjusted for other known risk factors of ICU delirium.

Preliminary results: Of the first 64 patients assessed, 26 had delirium according to CAM-ICU scores, and 38 did not. Patients had a mean age of 66,6 yrs and 25% were females, comparable to our general ICU population. There was no difference in highest measured blood sodium values, but a non-significantly higher proportion of cases with delirium had sodium values >150 mmol/L.

Conclusion and future directives: To make justified conclusions on the association between hypernatremia and ICU delirium, we will correct for the effect of other known risk factors, such as age, somatic and psychiatric comorbidities, length of stay, illness severity, organ support modalities, and certain ICU medications.

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DNA methylation in postoperative delirium

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Germany

Background: Postoperative delirium (POD) is a common and serious complication in older adults undergoing major surgery, associated with prolonged hospitalization, long-term cognitive decline, and increased mortality. Increasing evidence suggests that POD may reflect an underlying vulnerability to neurodegenerative processes, including Alzheimer's disease (AD). Previous analyses of the Bio-PAWEL cohort identified changes in AD- and neurodegeneration-related plasma biomarkers, including amyloid- β , phosphorylated tau, neurofilament light chain, and glial fibrillary acidic protein, in patients who developed POD. However, the role of epigenetic regulation, particularly DNA methylation, in POD susceptibility and risk remains unclear. **Aims and Methods:** The goal of this project is to determine whether patients who develop POD show distinct DNA methylation patterns before and after surgery compared with patients who do not develop POD. From 535 available Bio-PAWEL samples, 32 paired pre- and postoperative blood samples from 16 patients were selected for genome-wide DNA methylation profiling using the recently developed 5-base sequencing solution to identify candidate differentially methylated CpG sites associated with POD.

Results: Genome-wide DNA methylation patterns were compared between patients who developed POD and those who did not. Among the top POD- associated changes, PDE4D ($\Delta\beta = -0.155$), TRIM27 ($\Delta\beta = -0.153$), ATP8B4 ($\Delta\beta = -0.126$), and TAB2 ($\Delta\beta = -0.122$) showed marked hypomethylation in POD patients and were selected for further targeted validation due to their potential relevance to neuroinflammatory and neuronal/synaptic processes.

Conclusion: These findings suggest that POD is associated with distinct peripheral DNA methylation changes and identify promising candidates for further validation that may help identify patients at increased risk before surgery.

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Palliative-psychological care in inpatient psychiatry

Gabi Gübel

Switzerland

Background/Aims: People with severe and persistent mental illness (SPMI) and advanced dementia are at high risk of delirium, yet inpatient psychiatry remains predominantly cure oriented. This study examined which contents, goals and limits of palliative-psychological care can be defined for inpatient psychiatry, and how these form an integrative concept.

Methods: Qualitative exploratory design. Eight semi-structured expert interviews were held with professionals from psychiatry, psychology, nursing and hospice care, plus one family representative, purposively sampled in Germany, Switzerland and the United States, each with at least five years of clinical experience. Transcripts were analysed using Mayring's qualitative content analysis, combining deductive and inductive category building.

Results: Palliative-psychological approaches were barely established. Existing activities were fragmented and conceptually unclear, and the term itself was often unfamiliar. Advanced dementia was named as a core target group in four of eight interviews, alongside treatment-refractory schizophrenia, bipolar disorder, severe depression and personality disorders. Barriers were structural (staff shortage, financing), professional resistance, and ethical uncertainty, particularly respecting the will of patients with fluctuating or absent decisional capacity. Continuity of care, interdisciplinary teamwork, biography work, music therapy and systematic family involvement emerged as success factors.

Conclusions: Findings were consolidated into a seven-module concept: structured indication, existential and psychotherapeutic support, family integration, therapeutic continuity, spiritual and cultural care, interdisciplinary team structure, and cross-sector transition management. Several modules address prerequisites for delirium care: relational continuity, families as informants on baseline cognition, and a structured response to fluctuating capacity. Prospective studies should test the concept where delirium and dementia overlap.

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Effect of anesthesia induction speed on intraoperative EEG patterns associated with the risk for postoperative delirium

Sandra Widmann, Svenja Letz, David Obert, Eleni Ostertag, Christian Uebelacker, Anna Schormair, Gerhard Schneider, Matthias Kreuzer, Stefanie Pilge

Germany

Background: Intraoperative electroencephalographic (EEG) patterns during general anesthesia are associated with postoperative neurocognitive outcomes. Specifically, sustained alpha oscillations have been identified as markers of favourable brain states, whereas burst suppression has been linked to an increased risk of postoperative delirium [1]. Retrospective data suggest that slower induction of anesthesia may promote more favorable intraoperative EEG patterns [2], but prospective evidence in larger patient cohorts is lacking.

Methods: In this prospective observational study, 125 patients aged ≥ 65 years undergoing elective surgery under general anesthesia are enrolled. Anesthesia is induced either with a propofol bolus or a slow constant-rate propofol infusion. Time to loss of responsiveness is recorded. Frontal EEG is recorded continuously throughout the perioperative period. The primary endpoint is relative alpha power during anesthesia maintenance. Secondary endpoints include the occurrence of burst suppression and post-anesthesia care unit (PACU) delirium, assessed with the CAM-ICU at 15 and 45 minutes after PACU admission. Preoperative cognitive status is evaluated using the Montreal Cognitive Assessment.

Results: Data collection and analysis will be completed before the conference. We hypothesize that slower anesthesia induction is associated with increased alpha power, reduced burst suppression and a lower incidence of PACU delirium.

Conclusion: This prospective study will provide insight into whether anesthesia induction speed influences intraoperative EEG signatures linked to postoperative neurocognitive outcomes. It may identify a simple, feasible strategy to optimize anesthetic management by adjusting the induction procedure.

[1] Xu et al. Br J Anaesth. 2025 Dec;135(6):1684-1703. [2] Obert et al., Sci Rep. 2020 Nov 10;10(1):19444.

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POSTER 53

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UK hospital practice on delirium and cognitive assessment and follow-up: a national survey

Rose S Penfold, Katherine Chin, Katherine E Walesby, Sarah J Richardson, Jennifer K Burton, on behalf of the Geriatric Medicine Research Collaborative

United Kingdom

Background/Aims: Delirium screening is increasingly embedded in routine care, but less is known about pathways after a positive screen. We aimed to describe current hospital practice in delirium screening and management, post-discharge follow-up, and inpatient dementia assessment.

Methods: We conducted a UK-wide cross-sectional survey through the trainee-led Geriatric Medicine Research Collaborative between 10/03/2026 and 06/05/2026. We collected data on delirium screening, actions following a positive screen, post-discharge pathways and inpatient dementia assessment. Quantitative responses were summarised descriptively; content analysis was used for free-text responses.

Results: Responses from 46 hospitals were included. Among hospitals responding to delirium screening items, 30/43 (69.8%) reported screening adults aged ≥ 65 years for delirium most or all the time; 39/43 (90.7%) used the 4AT. Screening was usually undertaken in emergency or acute admission areas or when delirium was clinically suspected. Following a positive screen, confirmation by a doctor was reported as occurring most or all of the time in 27/41 (65.9%) hospitals. Use of structured management tools (e.g. TIME bundle), written or verbal information for patients and families, specialist delirium referral and post-discharge follow-up was variable; 17/42 (40.5%) hospitals reported no delirium follow-up pathway. Assessment or diagnosis of possible dementia during admission was reported by 26/42 (61.9%) hospitals, but approaches varied and were limited by diagnostic uncertainty, short admissions, limited collateral history and lack of specialist pathways.

Conclusion: UK hospitals commonly use the 4AT, but post-screening pathways vary substantially. Findings suggest an implementation gap between delirium detection and structured management, follow-up and reassessment of persistent cognitive impairment.

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Timing matters: admission, postoperative-only and persistent delirium after hip fracture in a national registry cohort

Rose S. Penfold, Kirsty Ward, Lorraine Donaldson, Stephen Bridgman, Antony Johansen, Alasdair M. J. MacLulich

United Kingdom

Background/Aims: Delirium is common in patients with hip fracture, but whether admission and postoperative delirium represent the same clinical phenotype is uncertain. Scotland recently introduced postoperative 4AT delirium assessment alongside longstanding admission assessment, enabling evaluation across both timepoints.

Methods: We analysed national Scottish audit data for adults aged ≥ 50 years with a hip fracture between 1 April 2023 and 31 December 2025. Delirium was assessed prospectively using the 4AT on admission and postoperatively. We compared baseline characteristics and, among patients assessed at both timepoints, used multivariable logistic regression to examine associations with 30-day mortality and return home.

Results: Among 22,782 patients (mean age 80 years; 69% female), 4AT completion was substantially higher on admission (87.8%) than postoperatively (45.0%; 10,019/22,244 operatively managed patients). Delirium was present in 3854 (19.3%) on admission and 3023 (30.2%) postoperatively. Of 8967 patients assessed at both timepoints, 528 (5.9%) had admission-only delirium, 1424 (15.9%) postoperative-only delirium and 1189 (13.3%) delirium at both timepoints. Patients with admission delirium were older and had higher ASA grades than those with postoperative-only delirium (84.5 vs 83.0 years; ASA 4–5, 25.5% vs 19.1%). Delirium at both timepoints had the poorest outcomes: compared to no delirium, 30-day mortality was higher (aOR 3.33, 95% CI 2.62–4.24) and return home less likely (aOR 0.20, 95% CI 0.15–0.27).

Conclusions: Admission, postoperative-only and persistent delirium identify clinically distinct groups with different baseline vulnerability and short-term outcomes. Assessment at both timepoints may provide useful prognostic information, although low postoperative completion rates remain a major implementation gap.

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Relative EEG band powers and altered arousal in inpatients with delirium and Parkinson's disease: an exploratory study

Daisy Rusdale, Martha Walker, Jahfer Hasoon, Florence Gerakios, Alison J. Yarnall, Sarah J. Richardson, Louise Allan, John-Paul Taylor, Mark Baker, Rachael A. Lawson

United Kingdom

Background: People with Parkinson's disease (PD) are at increased risk of delirium, which is associated with poor clinical outcomes. Diagnosing delirium in PD is challenging because core clinical features including altered arousal, cognitive fluctuations and hallucinations overlap. Electroencephalography (EEG) shows promise as an objective biomarker of delirium, yet there remains a paucity of literature investigating its relationship with clinically assessed arousal in PD delirium.

Objective: To investigate the association between EEG measures and altered arousal in hospitalised people with PD, with and without delirium.

Methods: Hospitalised people with PD were recruited. Delirium was diagnosed using Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM- 5) criteria. Participants underwent resting-state EEG with eyes-closed (EC) and eyes-open (EO) recordings. Relative delta, theta, pre-alpha, alpha and beta band powers, and the reactivity index (RI), were calculated. Altered arousal was assessed using the Observational Scale of Level of Arousal (OSLA) and Modified Richmond Agitation-Sedation Scale (m-RASS). Associations between EEG measures and altered arousal were explored using Spearman's rank correlation.

Results: Six participants were included (delirium, n=4; no delirium, n=2). Relative EEG band powers did not differ significantly between groups. Greater altered arousal was associated with increased relative beta power (EO: $\rho=0.841$, $p=0.036$; EC: $\rho=0.754$, $p=0.084$). Greater delta reactivity was associated with more hypoactive presentations (m-RASS: $\rho=-0.886$, $p=0.019$), while reduced theta reactivity was associated with greater altered arousal (OSLA: $\rho=-0.841$, $p=0.036$).

Conclusion: EEG reactivity may provide additional information about altered arousal in PD delirium beyond resting EEG band power. These exploratory findings warrant further investigation in larger prospective studies.

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Can Mobile EEG identify delirium in Lewy Body Disease? The EEG-DEL Protocol

Daisy Rusdale, Louise Allan, Sarah J Richardson, John-Paul Taylor, Mark Baker, Rachael A Lawson
United Kingdom

Background: People with Lewy body disease (LBD) are at increased risk of delirium during hospitalisation. Delirium is associated with mortality, cognitive decline and loss of independence. However, recognising delirium in LBD is challenging because key clinical features overlap. Electroencephalography (EEG) shows promise as an objective biomarker in delirium and Lewy body disease, yet little is known about EEG in inpatients with delirium and LBD, or after recovery.

Objective: Can we use EEG as a biomarker of delirium Lewy Body Disease (EEG-DEL) study aims to determine the feasibility of EEG as a biomarker of delirium in inpatients with LBD.

Methods: EEG-DEL is a prospective observational feasibility study recruiting adults with Parkinson's disease (PD), PD mild cognitive impairment (PD-MCI), PD dementia (PDD), dementia with Lewy bodies (DLB) and DLB with MCI (MCI-LB). Hospitalised inpatients with LBD will undergo a 10-minute bedside mobile EEG (eyes closed and eyes open) and standardised delirium assessments using Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria. Feasibility outcomes include recruitment, retention, tolerability and EEG signal quality. Clinical assessments of delirium severity, motor function, cognition, frailty and sleep will be performed. Participants will complete a three-month follow-up assessment and repeat EEG.

Conclusion: This study addresses a gap in LBD research by investigating the feasibility of mobile EEG during delirium in acute hospitalisation. The findings of this study will further our knowledge of the mechanisms of delirium in LBD, informing larger studies evaluating EEG biomarkers to improve delirium diagnosis, prognosis and patient outcomes.

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4AT screening: acute medical unit audit

A. Dhawn, C. Shi

United Kingdom

Background/Aims: Delirium affects 20–30% of older inpatients and independently increases mortality, length of stay and long-term cognitive decline. However, it is frequently missed when diagnostic attention is shifted to a primary acute illness or when confounded by baseline cognitive impairment. NICE guidelines recommend routine 4AT screening of older patients on acute admission (audit standard $\geq 90\%$). We audited 4AT completion in patients aged ≥ 65 on an acute medical unit (AMU) and examined which presentations were least likely to be screened.

Methods: A 2 cycle audit was performed reviewing whether a 4AT was completed during the admission of AMU patients aged ≥ 65 during one week in September 2025 (cycle 1) and July 2026 (cycle 2). The intervention was a departmental teaching session presenting the baseline results and highlighting the importance of compliance.

Results: There was an improvement in 4AT documentation from 4/30 (13%) to 15/52 (29%). However, this remained far below the $\geq 90\%$ target. Completion was lowest in patients with infection/sepsis (3/15 or 20%) and known dementia (4/11 or 36%), compared with those presenting with falls (7/12 or 58%). Only 3/9 (33%) of patients presenting with confusion or altered mental state had a 4AT completed. During cycle 2, 6/15 (40%) with 4AT completed scored ≥ 4 (probable delirium).

Conclusions: Delirium was recognised least in those who were acutely unwell or who had cognitive impairment. To drive further improvement in 4AT screening, targeted feedback and trigger-based alerts on electronic health record systems for patients aged ≥ 65 may offer an effective next step.

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Healthcare Professionals' Perspectives on Single-Channel EEG and Delirium Observation Screening Scale after Cardiac Surgery: A Qualitative Study on Beliefs and Dilemmas

Miarca ten Broeke, Anna Weierink, Ron G. H. Speekenbrink, Job van der Palen, Jutta Arens, Frank R. Halfwerk

Netherlands

Background/Aims: Older patients frequently develop delirium after cardiac surgery. Nurse-reported screening instruments, such as the Delirium Observation Screening Scale (DOSS), are used to detect delirium. Nevertheless, hypoactive delirium is often overlooked. Single-channel electroencephalography (SC-EEG) was developed for earlier and more objective identification, even before clinical manifestations become apparent. This study explored beliefs and dilemmas of healthcare professionals regarding the use of SC-EEG and DOSS in daily clinical practice.

Methods: A qualitative descriptive design with a constructivist approach was used. Four focus group interviews were conducted with nursing assistants, registered nurses, and advanced nurse practitioners from the cardiac surgery ward at Thorax Centrum Twente, MST. Focus group data were analysed using thematic analysis.

Results: Five themes were identified. The three dominant themes based on ten subthemes were: (1) factors influencing early detection including recognition of delirium subtypes, timing of screening, enhanced awareness, and clinical judgement versus instrument-based assessment; (2) interpretation, communication, and knowledge, addressed result interpretation, communication with patients and families, and professionals' knowledge and skills; and (3) adherence and barriers, involved non-adherence to screening protocols and follow-up procedures. Across all themes, beliefs and dilemmas were interwoven. Beliefs mainly related to perceived added value of delirium screening for early detection and awareness; dilemmas were particularly evident in interpreting screening results.

Conclusions: Healthcare professionals' expressed beliefs and dilemmas for both delirium screening instruments. Based on our study we recommend combining clinical judgement, family involvement, and delirium screening outcomes to enhance early detection of all delirium subtypes, particularly hypoactive delirium.

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Baseline incidence and clinical impact of postoperative delirium before implementation of a hospital-wide prevention strategy: a prospective cohort study in a Dutch hospital

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Netherlands

Background/Aims: Postoperative delirium (POD) is a common complication in older surgical patients and is associated with prolonged hospitalization, delayed recovery, and increased healthcare burden. A recent meta-analysis including Dutch cohorts reported an overall POD incidence of 18%. Project Operatie HELDER aims to identify patients at increased POD risk and implement targeted evidence-based perioperative prevention strategies. This baseline study determined the incidence of POD before implementation.

Methods: This is an ongoing prospective observational cohort study in patients aged ≥ 50 years undergoing surgery in a large Dutch hospital. POD was identified using clinical assessments (Delirium Observation Screening Scale, Intensive Care Delirium Screening Checklist), specialist consultation, and concomitant antipsychotic treatment. We studied POD incidence, associated factors, and postoperative hospital length of stay using univariable and multivariable analyses.

Results: At the time of this preliminary analysis, 500 of the intended 1000 patients had evaluable POD follow-up. The median age was 70 (IQR 63–77) years and 62.2% participants were male. POD occurred in 57 patients (11.4%). Patients with POD had a longer postoperative hospital stay than patients without POD (median 8 vs. 4 days; $p < 0.001$), and this association persisted after multivariable adjustment. Older age, emergency surgery, history of delirium, cognitive impairment, and higher ASA scores were associated with POD.

Conclusions: The incidence of POD was lower than previously reported. POD remained independently associated with prolonged postoperative hospitalization. Older age, emergency surgery, history of delirium, cognitive impairment, and higher ASA scores were associated with POD, underscoring the importance of targeted perioperative identification and prevention strategies.

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Pain, attention and EEG alpha activity

Francesca Storey, Mariya Prokhorenko, Michael L. Keaser, Patrick Skippen, Andrew J. Furman, David A. Seminowicz, Ali Mazaheri

United Kingdom · United States · Australia · Canada

Background/Aims: Chronic pain is associated with reduced cognitive function, potentially due to a diversion of cognitive resources to processing pain. However, reduced cognitive function during pain is not always consistently evidenced, perhaps due to individual differences in the attentional cost of pain processing. In the current electroencephalography investigation, we therefore examined differences in the top-down modulation of oscillatory activity in a cognitive task, between participants who performed better, and worse, during experimentally induced neuropathic-like pain. We aimed to investigate whether pain's effect on attentional performance is associated with a behavioral strategy, reflected by modulation of alpha power.

Methods: We employed a cross-modal attention task in which visual cues indicated whether participants needed to judge the visual orientation or discriminate the auditory pitch of an upcoming target. The visual and auditory targets were presented either simultaneously or individually, enabling us to assess the “cost” of having a distractor present in each modality. Participants engaged in the task under two conditions: prolonged pain via the capsaicin- heat pain model, and pain-free.

Results: Participants less “costed” by visual distraction during pain demonstrated a greater increase in alpha power (8–12 Hz) over frontal/central electrodes during pain. This may reflect inhibition of regions related to the processing of painful stimuli (somatosensory cortex), which could increase availability of resources to meet task-demands – a possible task-favouring pattern.

Conclusion: In conclusion, our results support the notion that better cognitive function during pain is associated with a behavioral strategy.

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Cerebrospinal fluid/serum albumin quotient and delirium in 499 hip fracture patients: a prospective cohort

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Norway

Background/Aims: Barrier disruption is widely assumed, but remains unproven, in delirium. The cerebrospinal fluid-serum albumin quotient (QAlb) is commonly used as a marker of blood-cerebrospinal fluid barrier function. In this prospective cohort of patients with hip fracture, we aimed to assess the association between preoperative QAlb and delirium.

Methods: Albumin was analysed in CSF and serum obtained in conjunction with spinal anaesthesia in patients with hip fracture. Elevated QAlb was defined as a value above the age-adjusted upper reference limit ($4 + \text{age}/15$). Delirium was diagnosed according to DSM-5 criteria, and pre-fracture dementia status was determined using the Informant Questionnaire on Cognitive Decline in the Elderly (IQCODE). Multivariable logistic regression was used to assess the association between QAlb and delirium, adjusting for age, sex, pre-fracture dementia status, and American Society of Anaesthesiologists physical status.

Results: Overall, 228/499 (45.7%) patients had delirium at any time during the hospital admission and 71.9% of these had pre-fracture dementia. The proportion of patients with elevated QAlb did not differ between those with and without delirium. This pattern persisted after stratification by pre-fracture dementia status. In multivariable regression, QAlb was not associated with delirium (OR 1.00, 95% CI 0.96–1.05), and most patients with delirium did not have elevated QAlb (78.9%).

Conclusions: In the largest study to date, preoperative QAlb was not associated with delirium after hip fracture, and most patients with delirium had normal QAlb.

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Not All Burst Suppression Is Equal: EEG and Postoperative Delirium Vary with Its Timing

Magdalena Fabian, Nirooshee Bronebakk, Stephan Kratzer, Julian Ostertag, Gerhard Schneider, Matthias Kreuzer

Germany · Norway

Background/Aims: Burst suppression during general anaesthesia has been associated with postoperative delirium (POD). However, the electrophysiological changes surrounding its occurrence remain incompletely explored. We therefore examined EEG alterations associated with burst suppression and assessed whether electrophysiological characteristics and the incidence of POD differ depending on its timing during induction or maintenance.

Methods: Frontal EEG recordings from 157 patients undergoing general anaesthesia were retrospectively analysed. We classified patients as having induction- related, maintenance-related, or no burst suppression. EEG activity was examined in windows surrounding burst suppression, before incision, during maintenance, and throughout emergence, focusing on alpha-band power, with additional spectral and aperiodic analyses. POD was assessed using the Confusion Assessment Method.

Results: Alpha-band power and the aperiodic exponent showed no consistent changes in the EEG windows surrounding burst suppression. During emergence, however, absolute alpha-band power was highest in patients without burst suppression, intermediate with induction-related, and lowest with maintenance-related burst suppression (no vs maintenance: $p < 0.001$, $r = 0.521$; maintenance vs induction: $p < 0.001$, $r = 0.359$). Relative alpha-band power showed a similar pattern, while induction-related and no burst suppression did not differ significantly ($p = 0.187$). POD occurred in 37.5% with maintenance-related, 10.9% with induction-related, and 18.0% with no burst suppression ($p = 0.004$).

Conclusions: Our findings indicate that not all burst suppression is equal. EEG alterations may already be present around maintenance-related burst suppression rather than developing due to an episode. Overall, the results support the hypothesis that this pattern may reflect a more vulnerable brain state, depending on when it occurs.

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Plasma pTau217 and Incident In-Hospital Delirium in Older Adults in Norway – a HUNT Study

Kristine Ringnes Verlo, Wilhelm Frich, Geir Selbæk, Bjørn Heine Strand, Gro Gujord Tangen, Bjørn Erik Neerland

Norway

Background/Aims: Plasma phosphorylated tau at threonine 217 (pTau217) is a blood biomarker of Alzheimer's disease (AD) pathology. Some small studies have found pTau217 to be associated with postoperative delirium in patients without dementia. We aimed to study the association between pTau217 and incident in-hospital delirium in a large population-based cohort of older adults.

Methods: We included 9956 participants aged ≥ 70 years from HUNT4 70+ (2017–2019). At inclusion, cognitive function, frailty, and pTau217 levels were assessed. In-hospital delirium was assessed through retrospective chart review of electronic health records from study inclusion to 31 December 2023. We used Cox regression analyses with incident delirium as the primary outcome.

Results: Of 9956 participants, 1507 had ≥ 1 episode of in-hospital delirium during follow-up. In Cox regression models adjusted for age, sex, cognition, and frailty, those with intermediate pTau217 levels (≥ 0.40 pg ml $^{-1}$ and < 0.63 pg ml $^{-1}$) had a hazard ratio (HR) of 1.34 (95% confidence interval (CI) 1.13–1.59) compared with low pTau217 (< 0.40 pg ml $^{-1}$). Those with high pTau217 levels (≥ 0.63 pg ml $^{-1}$) had a HR of 2.01 (95% CI 1.72–2.35) compared with low pTau217. Sensitivity analyses with non-postoperative delirium as the outcome, and analyses restricted to cognitively unimpaired participants, supported the main results.

Conclusions: pTau217 levels were associated with incident in-hospital delirium in our cohort. The association remained in non-postoperative delirium and in cognitively unimpaired participants, suggesting that AD pathology increases vulnerability to delirium before clinical cognitive impairment and in delirium beyond the postoperative setting.

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Anticholinergic burden in older patients with delirium

Hashir Rana, Junaid Azhar

United Kingdom

Background: Delirium is a common and serious condition in older adults, frequently triggered or exacerbated by medications with anticholinergic properties. The Anticholinergic Cognitive Burden (ACB) scale provides a validated method to quantify cumulative anticholinergic load, with scores 3 associated with increased risks of cognitive impairment, falls, and mortality.

Aim: To evaluate the anticholinergic burden among patients admitted with acute delirium and identify opportunities to reduce high-risk prescribing.

Methods: A retrospective clinical audit was conducted on 48 patients aged 65 years admitted with delirium (4AT positive) to acute and general medical wards at Northampton General Hospital. Patients with stroke, end-of-life care, ITU admission, learning disability, alcohol excess, or recent surgery were excluded. A validated ACB calculator was used to determine each patients cumulative score.

Results: The mean patient age was 83 years; 60% were female. The average ACB score was 2.77. Half of the cohort (50%) had an ACB 3, indicating clinically significant anticholinergic burden. Common high-ACB contributors included amitriptyline, mirtazapine, oxybutynin/solifenacin, antipsychotics (risperidone/quetiapine), paroxetine, and antihistamines. Polypharmacy, inconsistent documentation, and frequent medication changes were notable challenges during data collection.

Discussion: A substantial proportion of delirium patients were exposed to potentially avoidable anticholinergic medications. This represents a modifiable risk factor for delirium recurrence and poorer cognitive outcomes. Findings highlight the need for routine medication review, prescriber education, and integration of ACB assessment into delirium pathways.

Conclusion: High anticholinergic burden is prevalent among older adults presenting with delirium. Targeted interventions including deprescribing, improved documentation, and staff training may reduce risk and improve patient outcomes. A prospective second audit cycle is planned to evaluate the impact of these measures.

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Prospective cohort study exploring modifiable risk factors of delirium in critical care: protocol for the DELIGHT-P study.

Sean Harrington, Rowena Carter, Daniel Hadfield, Thomas A. Pollak, Carly Welch

United Kingdom

Background/Aims: Despite high delirium prevalence in critical care (up to 70%)(1), underlying mechanisms remain poorly understood. Some evidence suggests circadian rhythm disruption and neuronal damage may play a role in its pathophysiology but further exploration is required (2–5).

DELirium and LIGHT: Exploring modifiable risk factors of delirium – A Pilot study (DELIGHT-P) is a prospective observational cohort study. The primary objective is to assess study feasibility by evaluating recruitment capability, retention rate and data collection procedures. Exploratory objectives will examine relationships between light exposure, circadian/neuronal biomarkers, delirium and cognitive outcomes.

Methods: This study is taking place in a tertiary critical care centre in London. We will recruit ten participants (inclusion: age >50, admitted <24hours, invasive line present, expected LOS >36hours; excluding primary neurosurgical diagnoses or severe cognitive impairment). Light sensors will collect environmental light data continuously for seven days alongside serial clinical assessments and blood samples to map circadian rhythm and delirium. Participants will be followed up at 30, 90 and 180 days. Primary feasibility outcomes include recruitment/retention rates and protocol adherence.

Results: Feasibility and exploratory clinical data will be summarised using descriptive statistics to inform the design of a future fully powered study.

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It's Not What, It's When: Temporal course as the missing discriminator between delirium and psychosis

Emily ML Bowman, Emma L Cunningham, Philip McGuire

United Kingdom

Background: Delirium is common but under-recognised in people with severe mental illness (SMI) (1), where its features are often misattributed to existing psychiatric disturbance. Recognising delirium in this population matters because it signals an acute, often reversible medical precipitant. Left unrecognised, delirium carries excess mortality and long-term cognitive risk. Delirium is not routinely screened for in mental healthcare. Whether routine psychiatric assessments capture the features that would distinguish delirium from a patient's existing mental illness, and so permit its retrospective detection from healthcare records, has not been systematically examined.

Methods: Using a linking rules content comparison approach, we extracted items from four delirium instruments (CAM, 4AT, DRS-R98, MDAS) and four SMI (PANSS, PSYRATS, HoNOS, BFCRS) instruments. We mapped 123 extracted items inductively onto 22 symptom domains. Domain-level instrument coverage was cross-referenced against pooled delirium symptom frequencies from our published systematic review which provided a library of 78 individually described postoperative delirium symptoms (2).

Results: Ten of 22 symptom domains were captured by both delirium and psychosis toolkits, including domains most frequently reported in our previous systematic review: attention, orientation, and perception. Therefore, the most commonly presenting features of delirium may be conflated with psychosis. Only three domains were delirium tool-specific, the clearest being temporal course (acute onset/fluctuation), followed by sleep-wake cycle disturbance and visuospatial ability. Conversely, aggression/behavioural dyscontrol was not reported by any core delirium instrument, but we previously reported that 17 studies which described this symptom in delirium.

Conclusions: Delirium and psychiatric assessment instruments overlap heavily in cross-sectional symptom content. The symptoms which may discriminate delirium and SMI rely on encoding change from baseline, which psychiatric instruments rarely capture. This mismatch may offer a plausible mechanism for delirium under-detection in SMI and motivate new approaches to extracting temporal instability from routine mental health records.

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Music intervention for rEduction of preoperative anxiety and prevention of postoperative deLirium in Older aDults undergoing cardiac surgerY (MELODY): a protocol of a randomized controlled trial

Sining Zeng, Kelu Yang, Elke Detroyer, Katleen Fagard, Danny Feike Hoogma, Johan Flamaing, Bart Meuris, Bart Meyns, Geert Verbeke, Steffen Rex, Koen Milisen

Belgium

Background/Aims: Postoperative delirium (POD) occurs in 25%-52% of older adults undergoing cardiac surgery and is associated with prolonged hospital stay, increased morbidity, and healthcare burden. Preoperative anxiety (PA) may increase the risk of POD and may represent a modifiable target for intervention. Music intervention is a simple, low-risk strategy that may reduce PA and prevent POD; however, current evidence remains limited. We hypothesize that perioperative music intervention reduces POD incidence.

Methods: MELODY is a prospective, two-arm, parallel-group, open-label randomized controlled trial. A total of 256 participants aged ≥ 65 years undergoing elective cardiac surgery will be randomly assigned (1:1) to music intervention plus standard care versus standard care alone. Participants in the intervention group will receive eight individualized music sessions (20-30 minutes each) from the day before surgery through postoperative day 5. The primary outcome is POD incidence within five postoperative days, assessed using the 3D Confusion Assessment Method (3D-CAM). Secondary outcomes include PA (assessed before and after the preoperative music interventions), POD severity, postoperative complications, and length of hospital stay. Exploratory analyses will assess whether baseline PA and preoperative changes in PA are associated with POD incidence.

Results: Recruitment is scheduled to commence in October 2026. As this is a study protocol, no outcome data are currently available.

Conclusions: MELODY will determine whether perioperative music intervention can reduce POD in older adults undergoing elective cardiac surgery, while providing further insight into the relationship between PA and POD.

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CT brain measures of cortical atrophy, but not white matter change, are associated with delirium in an acute general medicine population.

Jill F Betts, Jasmine M Gan, Jasmine J Thomas, Emma Colbourne, Sarah T Pendlebury

United Kingdom

Background: Detection and quantification of white matter changes (WMC) and atrophy on routinely acquired CT-brain scans in the acute setting could serve as a valuable resource in delirium prediction. We aimed to determine the prevalence and severity of WMC and atrophy on routinely acquired CT images in acute general medicine (AGM) patients using visual rating scales, and to assess for association with delirium.

Methods: Patients ≥ 65 years from a consecutive AGM cohort with prospective ascertainment of delirium according to DSMIV criteria were included. Visual ratings were applied to CT-brain scans < 5 years from admission for WMC (Fazekas scale) and atrophy (global cortical atrophy scale, GCA).

Results: Among 492 patients (mean/SD age=82/8.2years), 326 (66%) had substantial WMC (periventricular WM [PVWM] Fazekas=3 and/or deep WM [DWM] Fazekas=2). Age was associated with presence but not severity of WMC; patients with PVWM/DWM Fazekas score=0 were younger than those with score ≥ 1 (mean/SD age=82.1/8.1 vs 72.6/4.5years, $p=0.001$). WMC was not associated with delirium. Mean/SD GCA score was 19.1/5.9, with moderate correlation with age ($R=0.335$, $p<0.001$). Delirium was associated with higher GCA (delirium vs no delirium mean/SD=20.6/5.8 vs 18.0/5.8, $p<0.001$). After adjustment for age and sex, the severity of atrophy (highest vs lowest tertile) remained significant in patients with delirium- superimposed-on-dementia (adjOR 11.4[4.25-30.5], $p<0.001$) but not delirium only (adjOR 1.45[0.83-2.56], $p=0.197$).

Conclusions: Routine CT-brain imaging in AGM patients may have clinical utility in delirium risk prediction but would require automated neuroimaging analysis to avoid time-consuming human input. Future studies should determine whether atrophy in those with delirium predicts future dementia.

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4AT screening timeliness: service evaluation

Jasmine Jane Shaw, Karishma Moochooram, Charlotte Kenten, Mark Rawle, Alexandra Feast, Elizabeth Sampson

United Kingdom

Background/Aims: At the Barts Health NHS Trust, the 4 A's Test (4AT) is electronically prompted for all admissions aged ≥ 65 years to improve delirium identification. This formative service evaluation assessed 4AT use at one of the trusts hospital sites, focusing on fidelity, timeliness and equality of delirium screening.

Methods: Routinely collected Barts Health NHS Trust data were collected for non-elective inpatient admissions, aged ≥ 65 years, to Whipps Cross Hospital (WXH) from 1st January 2023 to 1st January 2026. Demographic, clinical and admission characteristics (including 4AT results and datetime) were analysed and reported descriptively. Missing data were treated as missing.

Results: Included admissions ($n=22,722$) were majority female, White, Christian, married/ in a civil partnership, spoke English as their preferred language, and resided within North East London (NEL). Mean age was 80.54 years ($SD=8.58$). Overall, 49.02% of admissions were screened using the 4AT; peaking in 2025 (68.78%). Median time-to-screen was 2.18 days (IQR: 1.06-4.51) and the proportion screened within the first 24 hours of admission was 23.75%; peaking in 2023 at 26.59%. Proportions screened increased with age and was higher for female and White admissions, those residing outside NEL, and those with dementia or moderate-to-severe frailty. Median time-to-screen generally increased with age but showed little variation across other demographic or clinical characteristics.

Conclusions: This service evaluation identified variations in 4AT screening fidelity and timeliness at WXH. Future studies could investigate inconsistencies in delirium screening practices to better understand and address their impact on delirium identification across patient groups.

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Personalized Auditory Communication Platform and Delirium Burden in Mechanically Ventilated Adults: The EMERGE Randomized Clinical Trial

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Israel • United States

Background: Delirium is common in mechanically ventilated ICU patients. Recommended non-pharmacologic interventions are resource-intensive and inconsistently implemented. We evaluated whether EyeControl-Pro, an automated bedside communication platform, reduces delirium burden.

Methods: In this single-blind trial, mechanically ventilated adults aged ≥ 50 years at three academic centers in the United States and Israel were randomized 1:1 to EyeControl-Pro (personalized orientation, family voice recordings, and music) or sham-control. Primary outcome was the proportion of patients with any delirium through Day 7 (D7), defined as ≥ 1 CAM-ICU-7 score > 2 . A prespecified Bayesian analysis complemented frequentist analyses.

Results: 148/149 randomized participants were analyzed. Mean age was 68.3 years, 42.3% female, and 94.5% were delirious at enrollment. Delirium burden through D7 was 69.2% with EyeControl-Pro versus 73.1% with sham (adjusted difference, -3.9 percentage points; 95% CI, -9.0 to 1.3 ; $p=0.14$). Using non-informative priors, Bayesian analysis yielded a posterior median odds ratio of 0.42 (95% highest-density interval, 0.13–1.33) and 93.4% probability of benefit. Exploratory longitudinal analysis showed a treatment-by-day interaction during the 7-day intervention period (nominal $p=0.03$); on D7, model-estimated delirium rates were 62% versus 79.1% (difference, -17.1 percentage points; OR, 0.43; 95% CI, 0.22–0.85; nominal $p=0.015$) favoring Eye Control-Pro. Lower delirium burden persisted through D14 (61.9% vs 70.7%; difference, -8.8 percentage points; 95% CI, -15.4 to -2.2 ; nominal $p=0.009$). No device-related serious adverse events occurred.

Conclusions: Although delirium burden through D7 was not significantly different between groups, prespecified Bayesian analyses suggested a high probability of benefit, and longitudinal analyses demonstrated lower delirium burden over time with EyeControl-Pro.

Trial registration: ClinicalTrials.gov Identifier: NCT06029244.

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Validation of Biomarkers for Postoperative Delirium in Cardiac Surgery Patients: FINDERI Cohort.

Fatima Irfan, Carlotta Derad, Maike Hohberg, Arghavan Fadavieslam, Ihtaz A. Malik, Irina Günther, Tobias Titsch, Iryna Krasiuk, Katharina Packroß, Matilda-Marie Becker, Alina Isabel Rediske, Nicholas Paul Süttmann, Clara Maria Knopp, Mohammed Chebbok, Stephanie Heinemann, Paul T. Itting, Ingo Kutschka, Barbara Morgado, Hermann Esselmann, Thomas Asendorf, Christopher M. Celano, Niels Hansen, Hassina Baraki, Monika Sadlonova, Jens Wiltfang, Christine A.F. von Arnim, FINDERI investigators

Germany · Switzerland · United States · Portugal

Background: Postoperative delirium (POD) remains a frequent complication after cardiac surgery. Biomarkers reflecting neuroinflammatory, vascular, and neurotrophic pathways were selected a priori based on findings from the multicentre PAWEL (Patientensicherheit, Wirtschaftlichkeit und Lebensqualitäts) cohort of cardiac and non-cardiac surgical patients, in which these pathways were implicated in postoperative delirium. Validation in homogeneous cardiac surgery populations is required. This study investigated the association of perioperative inflammatory and neuromodulatory biomarkers with POD in the FINDERI (FIND DELirium Risk factors) cohort.

Method: In the prospective, observational FINDERI study, 491 patients aged ≥ 50 years undergoing elective cardiac surgery were included. POD was prospectively assessed for 5 days using the Confusion Assessment Method (CAM) algorithm. Plasma samples were available preoperatively (N=462) and on postoperative day 7 (N=421). ANGPT-2, BDNF, TNF- α , CXCL-10, and CCL2 concentrations were quantified using ELLA multiplex immunoassays. Laboratory analyses were performed blinded to clinical outcomes. Besides descriptive analyses, associations between biomarkers and POD were evaluated using multivariable logistic regression models adjusted for age, female sex, education, geriatric patient status, surgery type, surgery duration, and modified Charlson comorbidity index.

Results: Amongst 491 patients, 106 developed POD. Descriptively, patients with POD had higher pre-op and post-op ANGPT2 (pre-op: $2,884.33 \pm 2,655.71$ vs. $2,156.51 \pm 1,881.35$ pg/ml, $p=0.012$; post-op: $5,817.21 \pm 5,807.63$ vs. $4,329.60 \pm 3,237.99$ pg/ml, $p=0.022$), higher pre-op TNF- α (14.19 ± 8.65 vs. 11.70 ± 5.38 pg/ml, $p=0.008$) and lower post-op BDNF (932.93 ± 606.04 vs. $1,202.52 \pm 1,584.34$ pg/ml, $p=0.013$) levels compared to non-POD patients. In the multivariable analysis, preoperative ANGPT2 (OR:1.39, 95% CI 1.09–1.77, $p=0.007$) and TNF- α (OR=1.42, 95%-CI 1.04–1.97, $p=0.032$) were associated with POD.

Conclusion: In this cardiac surgery cohort, POD was associated with perioperative alterations in biomarkers related to vascular permeability and neurotrophic pathways, supporting further evaluation of biomarker-based risk stratification for POD.

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Identifying Independent Preoperative Risk Factors for Postoperative Delirium: Toward an Efficient Assessment Tool for Perioperative Care

Gabriel Werner, Max Riegelsberger, Matthias Kreuzer, Johanna Müller, Alexander Hapfelmeier, Gerhard Schneider, Stefanie Pilge, Svenja Letz

Germany

Background: Despite guideline recommendations for standardized preoperative risk stratification, translating known risk factors into clinically applicable prediction remains challenging across heterogeneous care settings. This study aimed to identify independent preoperative risk factors for postoperative delirium (POD) to inform development of an efficient assessment tool to improve perioperative care at a university hospital.

Methods: This study included 2,975 patients aged ≥ 65 years undergoing elective surgery. Preoperative assessment comprised demographics, cognition using the MoCa, comorbidities, functional status, medication, and delirium risk factors. POD was assessed using 3D-CAM and CAM-ICU, accompanied by assessment of pain (NRS/VAS) and sedation status (RASS), from the post-anaesthesia care unit through postoperative day 3. Multivariable logistic regression was performed in a universal cohort and a cohort with complete assessment data. Missing data were multiply imputed according to the assumed missing-data mechanism.

Results: POD occurred in 193 patients (6.5%). In the universal model, older age (OR 1.12), female sex (OR 1.47), higher ASA category (OR 1.38), neurological comorbidity (OR 1.55), and “not-tested” geriatric assessment (OR 2.34) were associated with increased POD risk. In the tested cohort, frailty was additionally associated with increased risk (OR 1.29), while higher MoCA scores were protective (OR 0.82).

Conclusion: Model-specific, older age, cognitive function, frailty, female sex, higher ASA category, and pre-existing neurological conditions were confirmed as independent risk factors for POD. Notably, “not tested” should not be considered a missing value, but may represent a clinically relevant finding. These results can help guide the development and validation of an efficient clinical assessment tool.

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Delirium guideline implementation in surgery

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Germany

Background/Aims: Despite the availability of evidence-based guidelines for the prevention and management of delirium, their sustained and interprofessional implementation in clinical practice remains challenging. Bridging this implementation gap requires the systematic integration of evidence into routine care. Since 2023, we have been developing a best-practice approach for the systematic implementation of the S3 Guideline on Delirium in Older People in eight surgical disciplines at TUM University Hospital, aiming to bridge the theory–practice gap through continuous knowledge transfer.

Methods: Four implementation strategies are employed: (1) weekly 30-minute mandatory continuing education sessions; (2) bedside teaching integrated into clinical practice; (3) evidence-based informational materials for patients, family members, and healthcare professionals; and (4) “One- Minute-Wonder,” a brief, practice-integrated educational format delivered at the point of care. Ongoing anonymous assessments focus on knowledge and attitudes towards delirium care.

Results: Approximately 2,600 participations have been documented across 140 continuing education sessions. The combination of repetitive education and practice-integrated knowledge transfer has contributed to sustained changes in team culture and fostered a more consistent, delirium-sensitive approach to care. Delirium-sensitive care is openly discussed, and clinical decisions are increasingly addressed collaboratively and interprofessionally. Interim knowledge assessments indicate improvement in knowledge scores.

Conclusions: Delirium-sensitive care requires shared interprofessional responsibility. Bridging the theory–practice gap is achieved by continuous, practice-oriented, and repetitive knowledge transfer embedded in clinical workflows. A combination of different educational methods and their integration into routine care were key factors for successful implementation. Next, standardized assessment of knowledge and attitudes will evaluate the implementation process.

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Repeated-session EEG spectral shifts in Parkinson's disease: exploratory implications for delirium monitoring

Yong Jiang, Nursena Armagan, Emily Zahn, Annika Jeck, Lea Köslich, Angelika Fleischmann, Robert Fleischmann, Johanna Ruhnau

Germany

Background: Earlier identification of impending episodes may facilitate timely management of modifiable precipitants and limit delirium severity in Parkinson's disease (PD) patients. Repeated electroencephalography (EEG) may capture evolving cerebral dysfunction; however, evidence on multisession spectral changes in PD and their relationship with delirium remains limited.

Method: Five EEG sessions were conducted on five consecutive days in each patient, with 60-second eyes-open (EO) and eyes-closed (EC) recordings in a defined order. Twenty-three patients were included. Recordings with incorrect/missing markers or poor signal quality were excluded. Welch's method estimated power spectral density, and relative delta, theta, alpha, and beta power was calculated from 0.5–30 Hz sensor signals. Linear mixed-effects models assessed ordinal session, condition, and their interaction in 19 participants contributing 49 paired EO/EC non-delirium sessions. Sensor-level tests were exploratory and uncorrected for multiple comparisons. Robustness was assessed in participants with ≥ 3 usable sessions (9 patients, 32 sessions) and an expanded EC-only analysis (23 patients, 69 sessions). Delirium-tagged sessions were compared with same-participant non-delirium sessions.

Results: Relative delta power increased across sessions during both EO (slope=2.01, $p=0.046$) and EC (slope=2.19, $p=0.030$), while relative alpha power decreased during EC (slope=-0.95, $p=0.006$). Sensitivity analyses showed directionally similar, generally stronger effects. In two delirium-tagged sessions, EC delta/alpha and slow-to-fast power ratios were higher during delirium than in same-participant non-delirium sessions.

Conclusion: Repeated EEG showed an exploratory shift toward greater slowing across non-delirium PD sessions. Within-subject comparisons also suggested greater EEG slowing during delirium, supporting further investigation in larger samples with prospectively defined assessment timing.

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PACU Delirium Assessments are strongly biased by receding sedation

Viktor Bublitz, Sophie Leroy, Falk von Dincklage

Germany

Background: A growing body of research applies tools derived from the Confusion Assessment Method (CAM) to detect post-anaesthesia care unit (PACU) delirium. However, PACU assessments could also simply reflect receding sedation. To assess this entanglement, we examined the 3-minute diagnostic interview for CAM-defined delirium (3D-CAM) and its four features for their coupling with receding sedation across the first postoperative hour.

Methods: We retrospectively investigated elderly patients undergoing general anaesthesia ($n = 397$, MoDeSt-Study, DRKS00033703). 3D-CAM items and Richmond Agitation-Sedation Scale (RASS) were recorded at 0, 30 and 60 minutes postoperatively. Logistic mixed models were fitted for patients with either no (noPOD) or mild postoperative delirium symptoms (mildPOD) on the postoperative days 1-5.

Results: The correlation of RASS and 3D-CAM declined postoperatively. In noPOD, the 3D-CAM was strongly coupled to within-patient RASS (-1.74 log-odds per RASS point; 95% CI -2.18 to -1.31): strongest for altered level of consciousness (LOC), moderate for disorganised thinking and fluctuation, weak for inattention. In mildPOD, 3D-CAM coupling was weak and non-significant (-0.48 ; -1.28 to $+0.31$), of the features only LOC remained significant.

Conclusion: As expected, the LOC feature of the 3D-CAM mirrors RASS. But in noPOD patients the 3D-CAM and its features except for inattention are substantially driven by RASS. In these patients, PACU 3D-CAM may thus largely index residual anaesthetic effect rather than the intended construct of delirium, warranting caution when using CAM-based tools as an endpoint in perioperative delirium studies.

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Preoperative cerebral perfusion and arterial transit time: related to postoperative delirium severity?

Laura Ambrosius, Maria Scheutz, Gabriel Hoffmann, Adriana Usheva, Franziska Knolle, Anika Fix, Julia Schwarz, Juliana Zimmermann, Franziska Zistler, Christine Preibisch, Stefanie Pilge, Gerhard Schneider, Svenja Letz, Rachel Nuttall

Germany

Background/Aims: Postoperative delirium (POD) risk is linked to pre- (cognitive impairment, older age) and intraoperative risk factors (surgical stress, e.g., blood loss). Altered preoperative cerebral blood flow (preopCBF) and arterial transit time (preopATT) may play a mechanistic role in POD symptom severity (PODss). However, previous studies revealed mixed findings. To explore whether mixed results may be explained by arterial transit time (ATT) influences on arterial spin labeling (ASL)-based CBF, we measured ATT-corrected CBF for assessing the influence of CBF on POD risk in elderly patients.

Methods: Preoperative ASL-MRI, yielding ATT-corrected CBF and ATT, intraoperative blood-loss, and postoperative 3D-CAM assessment (5 days, 2x/day) of PODss were performed in 76 surgical patients (≥ 65 years); 36 were included in the final analysis. Mean gray matter CBF (gmCBF), mean gray matter ATT (gmATT), an interaction term between both values, and intraoperative blood-loss served as predictors in linear regression models built to predict PODss (maximum 3D-CAM severity score across all assessments per patient).

Results: Intraoperative blood-loss was positively correlated with PODss ($R^2=0.22$, $p=0.0039$). The main effect of gmCBF ($R^2=0.028$, $p=0.33$) and gmATT ($R^2=0.0032$, $p=0.75$) was not significant, yet a significant interaction was observed between gmCBF/gmATT and intraoperative blood-loss in predicting PODss ($R^2=0.25$, $p=0.0084$ / $R^2=0.21$, $p=0.025$).

Conclusion: Preoperative CBF and ATT, with surgical stress as intraoperative modulator, significantly predicted PODss. This corresponds with our current understanding of POD risk as a combination of pre- and intraoperative factors, suggesting disrupted preopCBF and preopATT as potential mechanisms of POD.

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Predicting Residual Delirium Risk at Hospital Admission Following Implementation of Multicomponent Prevention

Sophie Leroy, Mira Schomann, Annika Haase, Liane Janßen, Johanna Ruhnau, Agnes Flöel, Robert Fleischmann

Germany

Background/Aims: Multicomponent prevention (MCP) can reduce delirium, yet clinically relevant cases persist. Identifying vulnerable patients already at hospital admission could enable targeted intensification of preventive measures. We aimed to determine whether residual delirium risk after MCP can be predicted from routinely available admission data and to identify the most relevant baseline risk factors.

Methods: We analyzed 7,442 admissions of patients aged ≥ 65 years to neurology, internal medicine, and general surgery. Predictors were restricted to information available before delirium onset and included age, sex, admitting department, care dependency level, baseline Montreal Cognitive Assessment (MoCA), MoCA missingness, and admission. Elastic Net regression was used for feature selection, and eXtreme Gradient Boosting (XGBoost) for non-linear prediction. Performance was evaluated in an independent 20% test set, with SHapley Additive exPlanations (SHAP) used for interpretation.

Results: Delirium occurred in 737 patients (9.9%). Higher MoCA scores were protective (aOR 0.82, 95%CI 0.76-0.88), whereas inability to obtain a baseline MoCA was the strongest predictor (aOR 22.09, 95%CI 12.10-44.07). After accounting for cognition, chronological age was no longer significant (aOR 1.01, $p=0.44$), indicating that residual delirium risk after MCP is more strongly linked to baseline cognitive vulnerability than to age itself. XGBoost achieved an AUROC of 0.847, sensitivity of 83.7%, specificity of 73.4%, and NPV of 97.6%.

Conclusions: Residual delirium risk after MCP implementation can be identified with good accuracy at hospital admission. Cognitive vulnerability outweighed chronological age as a risk marker. Admission-based prediction may therefore support targeted, resource-efficient intensification of delirium prevention in patients at highest risk.

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Prognostic Impact of Delirium on Hospital Admission Across Ward and ICU Settings: A Systematic Review and Meta-analysis

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United Kingdom

Background/Aims: Delirium present on hospital admission is associated with adverse outcomes, but the magnitude of its prognostic effect and whether this differs between ward and intensive care unit (ICU) settings remain uncertain. We evaluated the association between admission delirium and mortality in older hospitalised adults.

Methods: Observational studies comparing outcomes in older adults with and without delirium on admission were included. Meta-analysis was performed in R using random-effects models with restricted maximum likelihood estimation. Odds ratios (ORs) with 95% confidence intervals (CIs) were pooled. Heterogeneity was quantified using I^2 . Prespecified subgroup analysis and meta-regression compared ward and ICU settings. Longer-term mortality, ICU admission and hospital readmission were analysed when reported by at least two studies.

Results: Fifteen studies involving 33,884 patients were included; 6,708 had delirium and 27,176 did not. Delirium on admission was associated with higher in-hospital mortality (OR 4.49, 95% CI 3.52–5.74; $I^2=67.3\%$). The association remained significant in ward studies (OR 4.88, 95% CI 3.70–6.45) and ICU studies (OR 3.78, 95% CI 2.35–6.07), with no significant difference between settings. Delirium was also associated with longer-term mortality (OR 3.73, 95% CI 3.08–4.52) and ICU admission (OR 5.05, 95% CI 1.37–18.66), but not hospital readmission (OR 0.98, 95% CI 0.69–1.40).

Conclusions: Delirium present on hospital admission is a strong prognostic marker for in-hospital and longer-term mortality. Its adverse association is consistent across ward and ICU settings, supporting early recognition and risk stratification.

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Brief Quantitative EEG for Simplified Delirium Risk Stratification in Parkinson Disease: A Proof-of-Concept Study

Nursena Armagan, Yong Jiang, Emily Zahn, Annika Jeck, Lea Köslich, Angelika Fleischmann, Johanna Ruhнау, Robert Fleischmann

Germany

Background/ Aims: Delirium is a common complication in hospitalized patients with Parkinson's disease (PD). Clinical risk assessment captures phenotypic vulnerability but is experience-dependent and time-consuming, whereas quantitative electroencephalography (qEEG) may provide a neurophysiological signature. We examined whether brief qEEG combined with routine clinical information could support delirium risk stratification.

Methods: We analyzed 31 participants with PD (12 women; mean age 76, range 66–89 years). EEG and delirium screening were performed daily for 5 days, with additional EEG during delirium. A theory-driven clinical risk score (sum: 0–10) incorporated age (65–74 years=0; 75–84=2; ≥85=4) cognitive impairment (MoCA<23=1 or MoCA<17=2), frailty (GFI≥4=2), comorbidity (CCI≥2=1), and anticholinergic burden (GABS≥3=1). A qEEG risk score (0–7) comprised peak frequency, relative spectral δ , θ , and β power, β phase-lag index, and δ - and β -band corrected amplitude-envelope correlation using literature-derived midpoint cut-offs. qEEG scores were summarized per participant as the mean (EEGmean) and maximum (EEGmax). Clinical and qEEG scores were stratified using three cut-off schemes to assess risk-classification concordance.

Results: Three participants developed delirium. Clinical–qEEG concordance was highest for EEGmean in Model 2 (71.0%; $\kappa=.324$) versus 54.8% for EEGmax ($\kappa=.162$). Delirium profiles were heterogeneous; PD34 was low risk clinically across all models but moderate/high by qEEG. In exploratory outcome analyses, adding EEGmean or EEGmax to the clinical score increased AUC from .583 to .643 in both models, without significant improvement.

Conclusions: Brief qEEG showed moderate concordance with clinical risk stratification, with EEGmean outperforming EEGmax. qEEG may add complementary information, but predictive validity was limited by only three delirium events. Further evaluation of qEEG with basic clinical data as an objective delirium risk assessment tool is warranted.

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Brain organoids and delirium patient CSF

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Norway

Background/Aims: Delirium is a common, serious disturbance of consciousness whose cellular basis remains poorly understood, as it is hard to model in animals and impossible to interrogate directly in patients. Dementia is one of the strongest risk factors for delirium, and APOE4 is one of the strongest genetic risk factors for dementia. We aim to develop a human cell model of delirium and to test the hypothesis that delirium involves an acute cellular energetic failure.

Methods: We are establishing a model in which cortical brain organoids of APOE3 and APOE4 genotypes are exposed to cerebrospinal fluid (CSF) from delirium and non-delirium patients. The model is still under development, and the first endpoints have now been assessed, beginning with cellular energy status.

Results: As an initial endpoint, delirium CSF led to a reduction in ATP levels while NAD levels were maintained, independent of APOE genotype, suggesting a selective effect on cellular energy status.

Conclusions: These early findings support the potential of patient-derived CSF to model aspects of delirium in human organoids. The model remains in development, with further mechanistic work assessing inflammation, mitochondrial morphology, and cytokine responses to dissect the underlying pathways.

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From Mania to Malignant Catatonia: Anti-NMDA Receptor Encephalitis Presenting as a Primary Psychiatric Disorder

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United States

Background: Anti-N-methyl-D-aspartate receptor (NMDAR) encephalitis frequently presents with prominent psychiatric symptoms, potentially mimicking primary psychiatric illness. Recognition of atypical features and evolving catatonia is critical for timely diagnosis and treatment.

Case: A 24-year-old woman with depression and anxiety presented with decreased need for sleep, mood lability, agitation, and psychosis after taking additional doses of venlafaxine. She was initially psychiatrically hospitalized for presumed antidepressant-associated mania and discharged on quetiapine. Worsening irritability, aggression, and behavioral changes prompted psychiatric readmission. Although initially concerning for first-episode mania with psychotic features, waxing and waning attention and cognitive impairment raised concern for an underlying medical process. She subsequently developed mutism, rigidity, and automatic obedience, followed by fever, hypertension, tachycardia, and creatine kinase elevation consistent with malignant catatonia. Antipsychotics were discontinued, and catatonia was treated with high-dose lorazepam and four bitemporal electroconvulsive therapy treatments. Serum and cerebrospinal fluid studies supported anti-NMDAR encephalitis, prompting discontinuation of ECT and discharge from inpatient psychiatry with transfer to the Neurology service for further evaluation and treatment. Her neurologic course included seizures and multidomain cognitive impairment. She received intravenous methylprednisolone and plasma exchange and enrolled in the ExTINGUISH trial. Whole-body FDG PET-CT revealed no underlying malignancy. Neuropsychiatric and functional symptoms gradually improved with immunotherapy.

Conclusion: Anti-NMDAR encephalitis can closely resemble first-episode mania, particularly when antidepressant exposure provides a plausible psychiatric explanation. Fluctuating attention, cognitive decline, catatonia, seizures, and autonomic instability should prompt evaluation for autoimmune encephalitis and reconsideration of an initial psychiatric diagnosis.

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Pediatric delirium awareness among PICU physicians

Mohammed Kanan

Saudi Arabia

Background: Pediatric delirium, a neuropsychiatric disorder, affects up to 66% of critically ill children, disrupting cerebral functioning. Often misdiagnosed or confused with other conditions, delirium remains a challenge in pediatric care. Objectives: to evaluate the awareness, practices, and management strategies for pediatric delirium in Saudi Arabia among healthcare professionals working in pediatric intensive care units (PICUs).

Method: A cross-sectional study assessed pediatric delirium awareness and management among physicians practicing in PICUs across various healthcare facilities in Saudi Arabia. The study spanned from December 2023 to February 2024 and included physicians with expertise in pediatric delirium. Utilizing a validated tool, data analysis was performed using SPSS version 24®. Statistical analyses included chi-square and Fisher exact tests for categorical variables with two groups and One-Way ANOVA for those with more than two groups. A p-value of less than 0.05 was deemed statistically significant.

Results: Ninety-eight participants responded to the emailed questionnaire (response rate: 61.25%). Most were PICU consultants (53.1%) working in government hospitals (85.7%). Uncertainty prevailed regarding delirium prevalence in their units (53.1%), with hyperactive delirium being the most reported type (31.6%). Preventive measures included maintaining a regular sleep-wake cycle (85.7%), modifying contributing factors (75.5%), and optimizing sedation goals (75.5%). The primary assessment tool was the Cornell Assessment of Pediatric Delirium (CAP-D). Supportive treatment (60.2%), non-pharmacological interventions (58.2%), and benzodiazepines (41.8%) were common preventive measures. A statistically significant association was found between professional qualification and recognition of delirium-mistaken conditions (p-value=0.001). PICUs with at least one consultant (p-value=0.023) and a nurse-to-patient ratio of 1:1 (p-value= <0.001) had significantly higher awareness, while single-patient rooms showed greater awareness compared to multiple-patient occupancy settings (p-value= 0.009) among healthcare professionals.

Conclusion: The study identified inadequate knowledge of delirium and assessment in PICUs, underscores the importance of enhancing consultants' knowledge working in these units, and considers the side effects of pharmacological interventions. Modifiable factors and non-pharmacological management should be encouraged to achieve an optimal outcome of pediatric delirium.

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CSF Proteomic Signatures of Delirium Differ by Dementia Status: Insights from a Hip Fracture Cohort

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Background/Aims: Delirium frequently occurs after hip fracture, particularly in people with pre-existing dementia, but whether its molecular signature differs according to dementia status remains unclear. We aimed to characterize cerebrospinal fluid (CSF) proteomic networks associated with delirium and determine how pre-existing dementia modifies these molecular responses.

Methods: We analysed CSF proteomic data from 208 participants, including 163 patients with hip fracture and 45 cognitively unimpaired controls. After quality control, normalization and imputation, 1,385 proteins were retained. Weighted gene co-expression network analysis was used to identify co-expression modules and their associations with hip fracture, delirium and dementia status. Machine-learning models were additionally used to evaluate the discriminative information contained within the proteomic signatures.

Results: Delirium was associated with markedly different proteomic responses depending on pre-existing dementia. In participants without dementia, delirium was associated with disruption of seven of eight protein modules, involving immune, complement, acute-phase and signalling pathways. In participants with dementia, only one module showed a delirium-associated change, predominantly involving metabolic processes. Proteomic classifiers distinguished delirium most strongly in participants without dementia, with an AUC up to 0.994, compared with 0.794 in those with dementia.

Conclusions: Pre-existing dementia substantially modifies the CSF proteomic signature of delirium. The broader molecular perturbation observed without dementia, compared with the more restricted metabolic alteration in dementia, supports a model in which chronic vulnerability lowers the biological threshold required to precipitate delirium. These findings highlight the importance of stratifying delirium studies by baseline dementia status.

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Quetiapine for pediatric delirium: systematic review

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Saudi Arabia

Background: Delirium in pediatric intensive care units (PICUs) is a significant neuropsychiatric condition that affects consciousness, attention, cognition, and perception. Its management is crucial due to its high incidence and potential severe outcomes.

Objective: This review aims to evaluate the safety and efficacy of quetiapine, an atypical antipsychotic, in managing pediatric delirium within PICUs, given its prevalent use in adults and emerging application in pediatric settings.

Methods: A systematic literature search was conducted across databases, including PubMed, Cochrane Library, EMBASE, and Scopus, with no restriction on publication date. Studies were selected based on their focus on the safety and efficacy of quetiapine in pediatric delirium management. Data extraction and synthesis were performed, pooling quantitative data for meta-analysis and assessing study quality and bias using standardized tools.

Results: The literature search yielded six studies suitable for inclusion, encompassing randomized controlled trials and observational studies. Quetiapine was generally well tolerated, with few serious side effects, such as QTc prolongation and metabolic issues. Efficacy outcomes were mixed, with some studies reporting reduced symptoms and duration of delirium. In contrast, others indicated no significant improvement compared to other treatments or placebo.

Conclusions: Quetiapine shows potential for managing pediatric delirium in PICUs, with a safety profile that is acceptable in short-term use. However, the evidence is inconclusive regarding its overall efficacy in reducing delirium incidence and duration. More robust, controlled trials are needed to establish clear guidelines and assess long-term safety and efficacy.

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