ABSTRACT BOOK

PATHOPHYSIOLOGY
REHABILITATION
RISK FACTORS
COVID-19
BIOMARKERS
NON-HOSPITAL CARE SETTINGS
PEDIATRIC MANAGEMENT
DELIRIUM
SLEEP DISTURBANCES
NEUROCOGNITIVE SEQUELAE

16TH ANNUAL MEETING OF THE EUROPEAN DELIRIUM ASSOCIATION

EUROPEAN DELIRIUM ASSOCIATION

DELIRIUM
POST-COVID PANDEMIC
lessons learned and future perspectives

Chaired by

- Prof. Giuseppe Bellelli
- Prof. Giuseppe Citerio
- Dr. Alessandro Morandi

NOVEMBER 3-4, 2022

MILAN, ITALY Grand Hotel Villa Torretta

AUSPICES

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OC 01 - ID 305

THE ROLE OF PREOPERATIVE ANXIETY IN THE DEVELOPMENT OF POSTOPERATIVE DELIRIUM IN OLDER SURGICAL PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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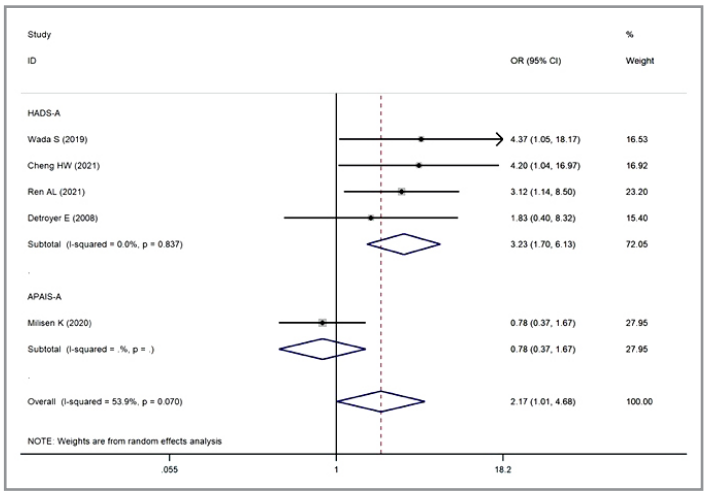
Background: Postoperative delirium (POD) is a common complication following surgery, being associated with multiple adverse outcomes and higher health care costs. Preoperative anxiety has been suggested to precipitate POD. We aimed to explore the association between preoperative anxiety and POD in older surgical patients.

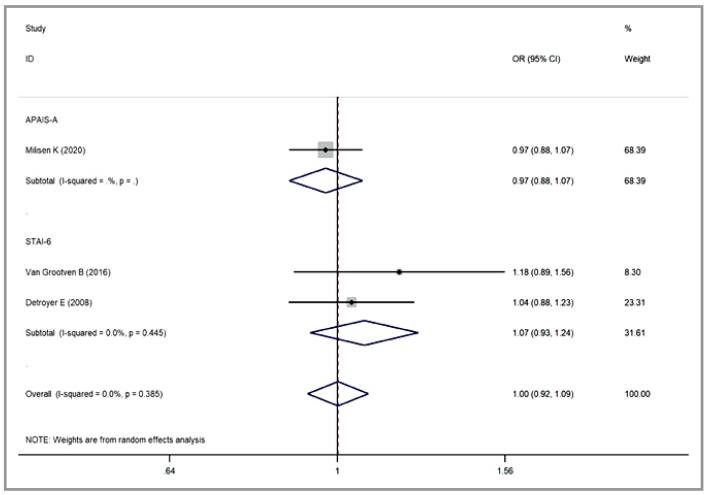
Materials and Methods: Electronic databases was systematically searched to identify prospective studies examining preoperative anxiety as a risk factor for POD in older surgical patients. Quality was assessed using the Joanna Briggs Institute Critical Appraisal Checklist for Cohort Studies. The association was summarized with odds ratios (ORs) and 95% confidence intervals (CIs) using random-effects meta-analysis.

Results: Eight studies with a total of 1140 participants aged between 63.1-82.3 years proved eligible. Four studies theoretically defined preoperative anxiety, and the most utilized assessment instrument for preoperative anxiety was Anxiety subscale of Hospital Anxiety and Depression Scale (HADS-A). Preoperative anxiety was significantly associated with POD when using dichotomized measures (OR= 2.17, 95%CI: 1.01-4.68, I^2=53.9%, n=5, Figure A) and the subgroup analysis of HADS-A (OR= 3.23, 95%CI: 1.70-6.13, I^2=0, n=4). No association was found when using continuous measurements (OR= 1.00, 95%CI: 0.93-1.09, I^2=0, n=3, Figure B), nor in the subgroup analysis of STAI-6 (six-item version of state scale of Spielberger State-Trait Anxiety Inventory, OR= 1.07, 95%CI: 0.93-1.24, I^2=0, n=2). The overall quality of included studies was moderate to good.

Conclusions: There is an uncertain association between preoperative anxiety and POD in older surgical patients, and the results need to be interpreted cautiously due to the ambiguity in conceptualization and measurement instruments used for preoperative anxiety.



OC 01 Figure 1A.



OC 01 Figure 1B.

OC 02 – ID 320

CO-OCCURENCE OF ANAEMIA AND DELIRIUM IN OLDER INPATIENTS WITH HIP FRACTURES

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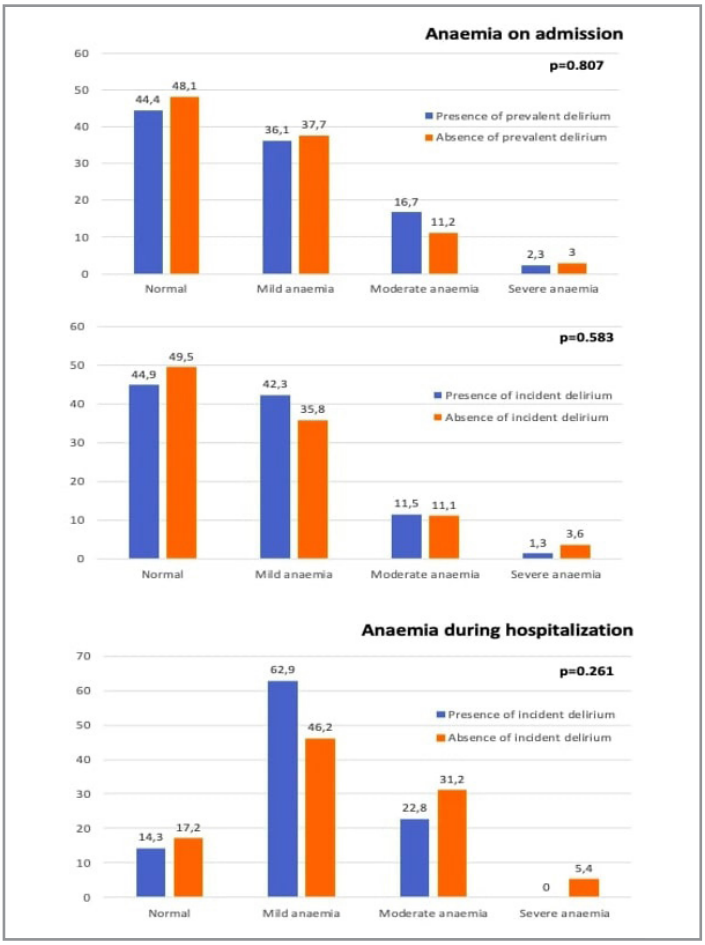
Background/Aims: The incidence of anaemia and delirium in older inpatients with hip fractures is extremely high. By reducing the amount of circulating oxygen, anaemia might contribute to the development of delirium. This study investigated the relationship between anaemia and delirium in hospitalized older people with hip fractures.

Materials and Methods: This prospective study involved older patients with hip fractures admitted to the Orthogeriatric Unit of Sant'Anna University Hospital of Ferrara (Italy) between January 2021 and February 2022. For each patient, we collected sociodemographic and clinical data and assessed delirium through the 4-AT test.

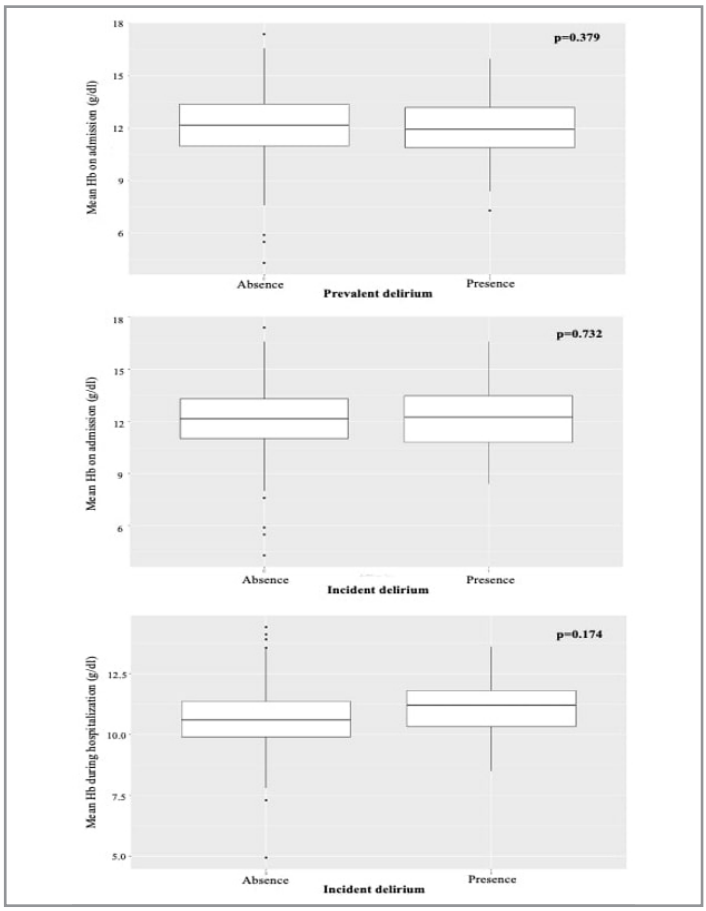
Results: The included 304 participants had a mean age of

83 years, with 74.7% women. The prevalence of anaemia was 52.3% (mild in 71.7% cases), while its incidence during hospitalization was 86.2% (mild in 60% cases). The mean haemoglobin at admission was higher than during the hospitalization (12.1 vs 10.0 g/dl, p<0.001). The prevalence of delirium was 11.8%, while its incidence during hospitalization was 29.1%. Advanced age and disability were higher among those with both prevalent (86.8 vs 82.7 years old, p=0.002; preserved BADL/IADL, respectively: 3.7 vs 5.4, p<0.001 - 2.0 vs 4.6, p=0.001) and incident delirium (86.2 vs 81.3 years old, p<0.001; preserved BADL: 3.8 vs 4.6, p=0.002; preserved IADL: 2.4 vs 4.1, p<0.001), compared with those with no delirium. The prevalence of dementia was higher among those with anaemia at admission (41.7% vs 15.9%, p=0.001). No significant differences were found in delirium frequency by presence and severity of anaemia (Figure 1) or comparing haemoglobin values at admission and during the hospitalization between patients with vs without delirium (Figure 2).

Conclusions: Our results do not suggest a strong relationship between anaemia and delirium, likely because of the multifactorial aetiology of delirium, for which anaemia is only one of several risk factors in this highly vulnerable population.



***OC 02** Figure 1.*



***OC 02** Figure 2.*

OC 03 – ID 321

DYSREGULATION OF CEREBRAL AUTOREGULATION AS A PATHOPHYSIOLOGICAL MECHANISM UNDERLYING DELIRIUM: A PRECISION MEDICINE APPROACH TO ICU DELIRIUM

Jasmine M Khan[1], Abby Shore[1], Kevin FH Lee[2], Michael D Wood[3], David Maslove[2,4], John Muscedere[4], Shane W English[5,6], Ian Ball[7], Marat Slessarev[7], Kirsten Fiest[8], Timothy Girard[9], J Gordon Boyd[1,3,4]

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Background/Aims: Cerebral autoregulation (CA) is a mechanism that acts to maintain consistent cerebral perfusion across a range of blood pressures. Impaired CA is associated with delirium[1,2], and individualized blood pressure targets can be derived from non-invasive CA monitoring. Blood pressure maintenance within the target autoregulation range reduces postoperative delirium rates in cardiac surgery[3], however, the impact of individualized MAP targeting to reduce ICU delirium has not yet been elucidated. Our goal is to determine whether non-invasive cerebral autoregulation monitoring and derivation of personalized blood pressure targets (MAPopt) is feasible in ICU patients.

Methods: Critically ill adults were enrolled if they had shock and/or respiratory failure requiring invasive mechanical ventilation for >24hrs. Patients' MAP and regional cerebral oxygenation (rSO2) were monitored for 72hrs. Patients were screened daily for delirium up to 30 days using the CAM-ICU. Impaired CA and MAPopt were determined using previously described algorithms[2,4], and were used to calculate area (time X magnitude) outside MAPopt.

Results: 113 patients were assessed. Mean physiological (3 SD) values over 72 hours were: rSO2 (68.5 3 6.0%), duration of disturbed autoregulation (209 3 243 minutes), MAPopt (77.6 3 9.2 mmHg), and proportion of area outside MAPopt (34.8 3 11.0%). 80(71%) patients experienced delirium. Cerebral autoregulation targets did not differ based on delirium status (Figure 1). However, target ranges were above the current recommendation of 65mmHg in the majority (72%) of patients.

Conclusions: We demonstrate that MAPopt targets are higher than the Surviving Sepsis guidelines in the majority of patients. The current one-size-fits-all approach may put patients at risk of cerebral hypo- or hyperperfusion. This work is part of an ongoing prospective multicentre study examining the association between parameters of cerebral perfusion, delirium, and long-term cognitive outcomes. Further, this work paves the way for interventional studies assessing whether applying patient-specific MAP targets improves ICU delirium.

Clinicaltrials.gov ID: NCT03141619

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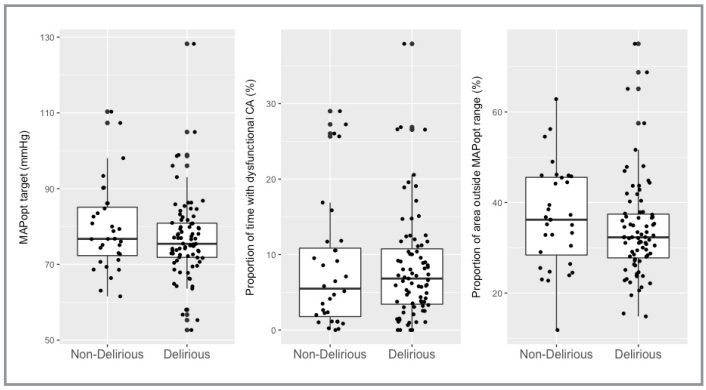

***OC 03** Figure 1.*

OC 04 – ID 362

DELIRIUM-RELATED DISTRESS AND RECOVERY CHALLENGES ASSOCIATED WITH COVID-19: AN ONLINE SURVEY

Heidi Lindroth[1,2], Caroline Shumaker[3], Minmin Pan[4], Annmarie Hosie[5], Roberta Castro[6,7], Sikandar Khan[2,8], Babar Khan[2,8]

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Background/Aims: COVID-19 has been associated with acute and chronic neurological syndromes including delirium and cognitive impairments. The purpose of this study was to describe the prevalence of self-reported confusion, related distress, and other cognitive, functional, and psychological symptoms in COVID-19 survivors.

Materials and Methods: Adults (>18yo) with a self-reported positive COVID-19 status were eligible to complete the anonymous online survey from May 2020-June 2022. The survey was distributed via social media channels including the Survivor Corps Facebook public group. Survey questionnaires collected data on demographics (age, sex, race, country of residence), comorbidities, the Delirium Experience Questionnaire, and the Healthy Aging Brain Care Monitor. Descriptive statistics are reported based on data structure. All analysis were performed using SAS 9.4.

Results: 2,715 people accessed the survey. Of those reporting demographic data (n=1,472), mean (standard deviation, SD) age was 49.2 (12.8) years, and most were female (n=1,355/1,664, 81.4%), White (n=1,517/1,709, 88.8%)

and reside in North American (n=2,588/2,884, 88%). Of the 1,606 who reported health care place during acute COVID-19, 76% were at their own or a family/friend's home and 14% were treated in hospital. The Delirium Experience Questionnaire was completed by 1,830 participants (60%), with 82% of these recalling feeling confused and 65% reporting moderate to severe related-distress. Mean (SD) self-reported symptom scores on the Healthy Aging Brain Care Monitor sub-sections were 6.49 (4.83) for cognition (n=1,762); 8.18 (7.16) for function (n=1,744); and 9.63 (5.77) for psychological (n=1,728), with higher scores indicating increasing symptom severity. Most (90%) participants reported these were new symptoms following COVID-19 illness.

OC 05 – ID 372

FRAILTY AND DELIRIUM: PREVALENCE IN A COHORT OF OLDER PATIENTS UNDERGOING ELECTIVE NEUROSURGERY

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Background/Aims: Frailty is a geriatric syndrome characterized by a progressive decline in homeostatic capacity and greater vulnerability to adverse events[1]. Post-operative delirium (POD) represents one of the most frequent complications of frail patients undergoing surgical procedure[2]. There is, however, paucity of studies that assessed the prevalence of POD in older patients undergoing elective neurosurgery.

The primary aim of this study is to assess the prevalence of frailty and the incidence of POD in a cohort of older people electively admitted to a neurosurgical ward to undergo a neurosurgical intervention.

Materials and Methods: This is a single-center, prospective, observational study recruiting older (≥ 65 years) patients admitted to the Neurosurgical Unit of ASST San Gerardo Hospital-Monza, to perform elective neurosurgery due to central nervous system diseases. After informed consent, all patients are evaluated on admission to the ward with the Comprehensive Geriatric Assessment (CGA). Frailty is assessed by Clinical Frailty Scale (CFS), Frailty Index-CGA (FI-CGA) and Frailty Phenotype with reference to the 15 days prior to hospitalization and delirium is assessed by 4AT from admission to the third post-operative day.

Results: On a sample of 50 patients, we found that the prevalence of frailty varied according to the instrument used: 38% using the Frailty Phenotype, 28% using the CFS (score > 4) and 26% using the FI-CGA (> 0.2). The incidence of the POD was 8%. The complete analysis of the data will be presented during the congress. The minimum expected number of patients enrolled in the study is 100.

Conclusions: This study aims to define the prevalence of frailty and the incidence of POD in an area that has not yet been explored enough. Data will be useful to plan appropriate interventions for the early identification and management of older patients at high risk of POD.

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OC 06 – ID 407

IMPAIRMENT OF CENTRAL LANGUAGE PROCESSING IN CRITICALLY-ILL COVID-19 PATIENTS WITH DELIRIUM

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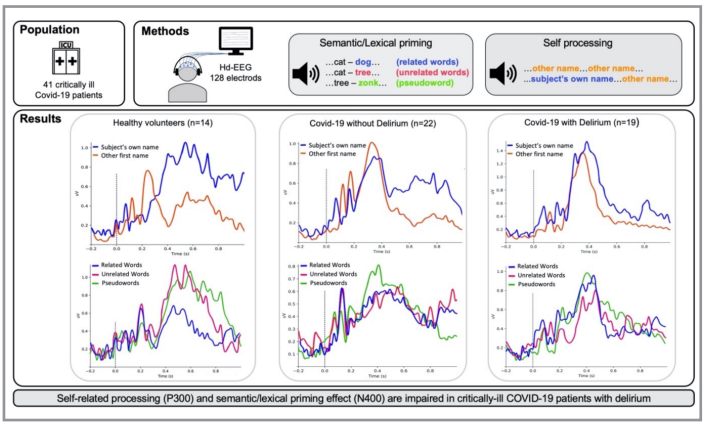
Background/Aims: Accumulating evidence indicates that coronavirus disease 2019 (COVID-19) is a major cause of delirium. Given the global dimension of the current pandemic and the fact that delirium is a strong predictor of cognitive decline for critically ill patients, this raises concerns regarding the neurological cost of COVID-19. Currently, there is a major knowledge gap related to the covert yet potentially incapacitating higher-order cognitive impairment underpinning COVID-19 related delirium.

Materials and Methods: The aim of the current study was to analyse the electrophysiological signatures of language processing in COVID-19 patients with delirium by using a specifically designed multidimensional auditory event-related potential battery to probe hierarchical cognitive processes, including self-processing (P300) and semantic/lexical priming (N400). Clinical variables and electrophysiological data were prospectively collected in controls subjects (n =14) and in critically ill COVID-19

patients with (n =19) and without (n =22) delirium. The time from ICU admission to first clinical sign of delirium was of 8 (3.5 - 20) days and the delirium lasted for 7 (4.5 – 9.5) days.

Results: Overall, we have specifically identified in COVID-19 patients with delirium, both a preservation of low-level central auditory processing (N100, P200) and a coherent ensemble of covert higher-order cognitive dysfunctions encompassing self-related processing (P300) and semantic/lexical language priming (N400) (spatial-temporal clustering, p-cluster ≤ 0.05).

Conclusions: We suggest that our results shed new light on the neuropsychological underpinnings of COVID-19 related delirium, and may constitute a valuable method for patient's bedside diagnosis and monitoring in this clinically challenging setting.



OC 06 Figure 1.

OC 07 - ID 316

TARGETED METABOLOMICS OF THE CEREBROSPINAL FLUID SUGGESTS IMPAIRED GLUCOSE UTILIZATION IN THE BRAIN IN DELIRIUM FOLLOWING HIP FRACTURE

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Background: Alterations in cerebral energy metabolism have long been proposed as a pathophysiological event in delirium. Although altered glucose uptake has been detected in positron-emission tomography (PET) studies, evidence is scant, and metabolic profiling studies of key metabolites in the cerebrospinal fluid (CSF) are lacking.

Aim: To investigate metabolites related to insulin resistance and energy metabolism in the serum and CSF of patients with hip fracture and assess whether their concentrations are associated with delirium.

Methods: The study included 450 patients acutely admitted to the hospital for surgical repair of a hip fracture. Delirium was assessed daily. Pre-fracture cognitive impairment status was assessed with the IQCODE. CSF was collected at the onset of spinal anesthesia, and blood samples were taken at admission. Glucose and lactate were measured using an arterial blood-gas instrument. Branched-chain amino acid (BCAA), 3-hydroxyisobutyric acid (3-HIB), acetoacetate (AcAc), and β-hydroxybutyrate (β-HB) serum and CSF concentrations were measured using gas and liquid chromatography-tandem mass spectrometry.

Results: In total, 224 (55%) of the patients developed delirium during hospitalization. Ketone bodies and BCAAs were elevated in the CSF among patients with delirium. However, there were no significant associations between delirium and elevated ketone bodies and BCAAs in serum, except for 3-HIB, which was significantly elevated in both CSF and serum. CSF lactate was elevated in delirium, however, this could be explained by age and comorbidity.

Conclusions: In our data, we find evidence of impaired glucose utilization mostly in the CSF with elevated 3-HIB also systemically. Our data suggest that the brain is not properly utilizing available glucose in delirium.

OC 08 – ID 338

PREDICTORS OF SEVERE DELIRIUM IN COVID-19: AN OBSERVATIONAL STUDY ON 2288 CONSECUTIVE HOSPITALIZED PATIENTS

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Background/Aims: Since the outbreak of SARS-CoV2 pandemic, delirium has been described as a common condition among older COVID-19 hospitalized patients, whereas its prevalence varies greatly between studies.
In this study, we aim at evaluate the predictors of severe delirium and its impact on in-hospital mortality in a large population of Covid-19 Italian patients.

Methods: 2288 COVID-19 patients were admitted in the ASST Spedali Civili of Brescia, form March 2020 to May

2022. Demographic and clinical features of patients with and without delirium were compared and logistic regression analysis was performed to evaluate predictive factors associated to severe delirium and mortality.

Results: Out of 2288 patients, 223 (9.7%) experienced severe delirium needing pharmacological treatment.

Subjects with delirium were older (80.9+12.6 vs 67.2+16.2, p <0.0001), exhibited worse pre-morbid conditions, expressed by Cumulative Illness Rating Scale (CIRS) (1.16+0.9 vs 1.05+0.9, p<0.0001) and modified Rankin Scale (mRS) (1.62+0.4 vs 1.44+0.4, p<0.0001) compared to patients without delirium. The two groups showed significant differences in terms of SARS-CoV2 severity disease namely quick sequential organ failure assessment (qSOFA) (2.34+1.4 vs 1.7+1.2, p <0.0001) and Brescia-COVID Respiratory Severity Scale (BCRSS) (2.35+1.3 vs 1.26+1.3, p<0.0001) score, with worse inflammatory blood parameters, compared to subjects without delirium. Interestingly, there was a higher percentage of vaccinated patients among patients without delirium (15.9% vs 19.7%, p=0.019). Mortality rates and mRS were worse in the delirium group compared to subjects without delirium, 31.4% vs 12.9% (p<0.0001) and 2.78+1.3 vs 1.57+1.3 (p<0.0001), respectively.

Finally, logistic regression analysis confirmed age, mRS and BCRSS as the strongest predictive factors for severe delirium, adjusted for gender, pre-morbid CIRS, vaccination and inflammatory blood parameters.

Conclusions: Larger studies are warranted to confirm these findings in order to identify COVID-19 patients with extreme vulnerability and a higher risk of delirium and poor outcomes.

	COVID-19 patients Total (n=2288)	COVID-19 patients with delirium (n=223)	COVID-19 patients without delirium (n=2065)	*p Value
Age, years		80.9±12.6	67.2±16.2	**<0.001**
Sex, Female		108 (48.4%)	900 (43.5%)	0.155
Hospital length of stay, days		20.7±16.4	15.2±16.5	**<0.001**
Full-dose Covid-19 vaccine		44 (19.7%)	330 (14.5%)	**0.019**
qSOFA score		2.34±1.4	1.7±1.2	**<0.001**
BCRSS		2.35±1.3	1.26±1.3	**<0.001**
Modified Rankin Scale premorbid		1.62±0.4	1.44±0.4	**<0.001**
CIRS pre-admission		1.05±0.9	1.16±0.9	**<0.001**
Lymphocytes		71.9±68.4	60.8±62.7	0.133
C-reactive protein (mg/L)		50.5±67.4	31.96±54.2	**0.025**
D-dimer (mg/L)		2535.8±186.4	1900.7±4036.8	**0.053**
Therapy:				
Low-flow oxygen therapy		95 (42.6%)	826 (40.0%)	0.952
High-flow oxygen therapy/NIV		93 (41.7%)	425 (20.6%)	**<0.001**
Steroid Treatment		132 (59.1%)	1018 (49.3%)	0.998
Outcomes measures				
Modified Rankin Scale at discharge (with death)		3.92±1.8	2.30±2.0	**<0.001**
Modified Rankin Scale at discharge (without death)		2.78±1.3	1.57±1.3	**<0.001**
In Hospital mortality		70 (31.4%)	266 (12.9%)	**<0.001**

OC 08 *Figure 1. Demographic, clinical, laboratory characteristics of all included patients.*
**p values were calculated by t-test and χ^2 test, as appropriate; BCRSS: Brescia-COVID Respiratory Severity Scale; CIRS: Cumulative Illness Rating Scale; qSOFA: quick sequential organ failure assessment; NIV: non-invasive ventilation.*

OC 09 – ID 344

DELIRIUM AND DYSPHAGIA: IS THERE AN ASSOCIATION IN ELDERLY PATIENTS ADMITTED TO A REHABILITATION SETTING?

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Introduction: Dysphagia is a swallowing disorder that affects 8% of the world population, more frequent in the institutionalized elderly with an incidence ranging from 7 to 16% depending on age, pathology and cognitive impairment. Dysphagia is underdiagnosed in the geriatric population; in addition to the physiological involution of swallowing, preliminary data indicate that the presence of delirium is a risk factor for the development of dysphagia, with a prevalence ranging from 22 to 59.4% in hospitalized elderly patients. The aim of this study is to evaluate the association between delirium and dysphagia in elderly patients admitted to a rehabilitation setting.

Methods: Retrospective cohort study for the analysis of patients admitted to the rehabilitation setting after an acute hospitalization (Ancelle-Nursing-Home, Cremona), between January-2018 and November-2019. Delirium on admission was ascertained with the 4AT, dysphagia with the 3OZ Test and confirmed by a speech-therapist evaluation. The association between delirium and dysphagia was investigated with a multivariate logistic regression analysis.

Results: We included 1040 patients,63.16%females,158 with dysphagia (mean age 82.4738.61),982 without (79.15310.71). The overall prevalence of delirium was 9.4%%, and 31.17% in those with dysphagia. The prevalence of dysphagia on admission was 13.86%, with a mild to moderate degree of severity (DOSS=4.4231.41), with a higher rate (51.27%) in patients admitted a neurological diagnosis followed by those admitted with an orthopedic diagnosis. In the multivariate logistic regression delirium was indeed associated with dysphagia (OR-2.06; IC-1.08-3.93) along with other factors including greater impairment in Instrumental-Activities-of-Daily-Living (IADL) before hospital admission (OR-1.26; IC-1.14-1.10), a greater loss in functional state between premorbid and admission (OR-1.02; IC-1.01-1.04), the number of antibiotics (OR-1.63; IC-1.01-2.62).

Conclusions: Delirium has a high prevalence in patients with dysphagia and is associated with a two times higher risk of having dysphagia regardless of other clinical conditions. The study indicates the need to further investigate the correlation between delirium and dysphagia and its clinical evolution.

OC 10 – ID 352

POSTOPERATIVE DELIRIUM IS ASSOCIATED WITH GREY MATTER BRAIN VOLUME LOSS

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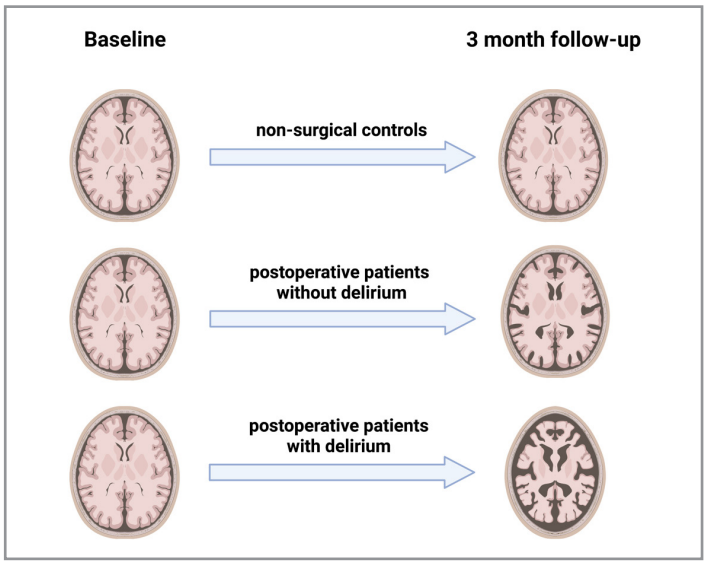
On behalf of the BioCog Consortium

Background/Aims: Delirium is associated with long-term cognitive dysfunction and with increased brain atrophy. However, it is unclear whether these problems result from or predispose to delirium. We aimed to investigate preoperative to postoperative brain changes, as well as the role of delirium in these changes over time.

Materials and Methods: We investigated the effects of surgery and postoperative delirium with brain MRIs made before and three months after major elective surgery in 299 elderly patients, and an MRI with a three-months follow-up MRI in 48 non-surgical control participants. To study the effects of surgery and delirium, we compared brain volumes, white matter hyperintensities, and brain infarcts between baseline and follow-up MRIs, using multiple regression analyses adjusting for possible confounders.

Results: Within the patients' group, 37 persons (12%) developed postoperative delirium. Surgical patients showed a greater decrease in grey matter volume than non-surgical control participants (linear regression: B (95% Confidence Interval) = -0.65% of intracranial volume (-1.01 to -0.29, $p < 0.005$). Within the surgery group, delirium was associated with a greater decrease in grey matter volume (B (95% Confidence Interval): -0.44% of intracranial volume (-0.82 to -0.06, $p = 0.02$). Furthermore, within the patients, delirium was associated with a non-significantly increased risk of a new postoperative brain infarct (logistic regression: odds ratio (95% Confidence Interval): 2.8 (0.7 to 11.1), $p = 0.14$).

Conclusions: Our study was the first to investigate the association between delirium and preoperative to postoperative brain volume changes, suggesting that delirium is associated with increased progression of grey matter volume loss.



***OC 10** Figure 1.*

OC 11 – ID 354

PRE-CRITICAL ILLNESS FRAILTY AND DELIRIUM-COMA FREE DAYS IN CRITICALLY ILL ADULTS

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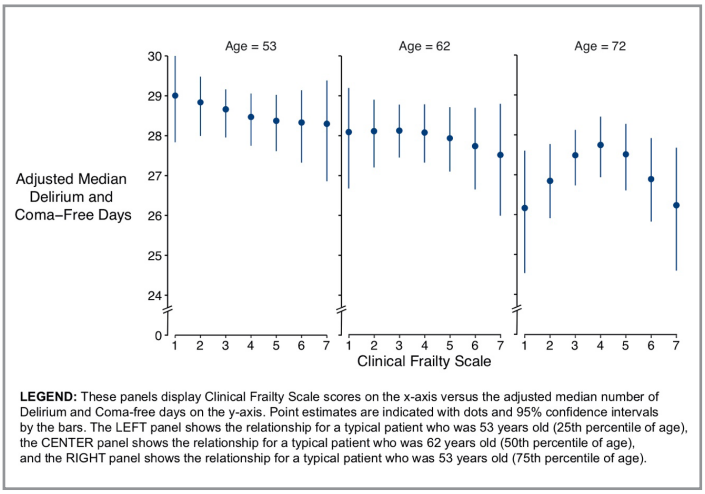
Background: Delirium develops due to patients' underlying vulnerabilities to an acute stressor. While stressors associated with delirium are well described, the relationship between underlying vulnerability and delirium is less clear. Clinically, underlying vulnerability is known as frailty—a syndrome of diminished physiologic reserve. We hypothesized that, in adults with critical illness, more severe baseline frailty is associated with fewer days alive without delirium or coma and differed by age.

Methods: We tested this hypothesis in participants ≥ 18 years old with respiratory failure and/or shock enrolled in the BRIAN-ICU and MIND-ICU prospective, multicenter cohort studies. We measured frailty using the 7-point Clinical Frailty Score (CFS, higher scores indicate more severe frailty) using clinical data, medical records, patient or proxy interviews,

and measures of comorbidity or disability. Twice per day in the ICU, and daily after ICU discharge for up to 30 days, we assessed delirium using the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU) and coma using the Richmond Agitation Sedation Scale (RASS). We calculated the number of days participants were alive and free of delirium and/or coma (delirium/coma-free days, DCDFs). To determine the association between frailty and DCDFs, we used proportional odds logistic regression adjusted for age, sex, race, education, comorbidities, baseline cognition, disability in basic and instrumental activities of daily living, mean daily modified SOFA score, mean benzodiazepine and non-benzodiazepine sedative doses, days of mechanical ventilation, days of severe sepsis, and an interaction term between age and CFS. We allowed all covariates to be non-linear via restricted cubic splines. Nonlinear and interaction terms were excluded if the p-value for the global test for nonlinearity or interaction was greater than 0.20.

Results: We enrolled 1040 patients who were a median [IQR] age of 62 [53-72], 40% female, and 89% were mechanically ventilated. The median CFS score at enrollment was 4 [3-5]. Among those with delirium or coma, the median number of days was 4 [2-7] and 3 [1-6], respectively. After adjusting for covariates, more severe frailty at enrollment was not independently associated with fewer DCDFs (p = 0.09); however, the association between frailty and delirium was modified non-linearly by age (p-value for interaction = 0.07, Figure).

Conclusions: Pre-critical illness frailty was not independently associated with days alive and free of delirium and coma. Nevertheless, this relationship differed significantly by age. Future studies should investigate how age and frailty combine to affect the risk of delirium.



LEGEND: These panels display Clinical Frailty Scale scores on the x-axis versus the adjusted median number of Delirium and Coma-free days on the y-axis. Point estimates are indicated with dots and 95% confidence intervals by the bars. The LEFT panel shows the relationship for a typical patient who was 53 years old (25th percentile of age), the CENTER panel shows the relationship for a typical patient who was 62 years old (50th percentile of age), and the RIGHT panel shows the relationship for a typical patient who was 53 years old (75th percentile of age).

OC 11 *Figure 1.*

OC 12 – ID 365

ASSESSING RECOVERY FROM DELIRIUM IN OLDER HOSPITALISED PATIENTS: VALIDATION OF THE 4AT

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Background: A crucial part of delirium care is assessing for recovery. Although the 4AT is currently only validated for detecting delirium at a single timepoint, it is often used on repeat occasions. The aim of this study is to assess the 4AT's performance as a tool for assessing delirium recovery.

Materials and Methods: Acute older hospitalised inpatients (≥70 years) with confirmed delirium were assessed on 2-4 occasions over ≤9 days. Paired researchers independently carried out blinded assessments of (a) a reference standard (DSM-5), including the Delirium Rating Scale-Revised 98, and (b) the 4AT plus additional brief measures of distress/psychotic symptoms.

Results: 111 participants with delirium took part in the study (median age 87, range 70-99, 61 (55%) female, 51 (46%) with dementia). All participants completed the first two assessments, 96 (86%) completed three assessments and 65 (59%) completed four assessments. According to the DSM-5 reference standard, 67 (70%) had delirium at 3rd assessment and 49 (75%) had delirium at 4th assessment. According to the 4AT, 77 (80%) had delirium at 3rd assessment (sensitivity 96%, specificity 87%) and 49 (75%) had delirium at 4th assessment (sensitivity 94%, specificity 100%). At first assessment, 70 (63%) participants experienced some distress, 27 (24%) of whom had moderate-to-severe distress. This decreased to 59 (53%) in the final assessment, with 23 (21%) experiencing moderate-to-severe distress. Psychotic symptoms were reported by 44 (40%) participants at first assessment and 22 (20%) participants at 4th assessment.

Conclusions: The 4AT appears to be suitable for capturing delirium recovery across repeat assessments. It is quick to administer and requires no training so may be most efficient to assess delirium recovery in acute hospital settings. There may also be value in adding a distress measure to

assessments of delirium recovery as many participants were still experiencing distress at the final assessment.

OC 13 – ID 378

QUALITY OF LIFE, COGNITIVE AND FUNCTIONAL TRAJECTORIES ASSOCIATED WITH POSTOPERATIVE DELIRIUM: A PROSPECTIVE COHORT STUDY IN HIP FRACTURE PATIENTS WITH 1- AND 3-MONTH FOLLOW-UP

Lucía Lozano Vicario[1], Román Romero-Ortuno[2], Bernardo Abel Cedeño-Veloz[1], Joaquín Fernández-Irigoyen[3], Enrique Santamaría[3], Fabricio Zambom-Ferraresi[4,5], Fabiola Zambom-Ferraresi[4], Antón De la Casa-Marín[4], Iranzu Ollo-Martínez[4], Chenhui Chenhuichen[1], Mikel Izquierdo[3], Nicolás Martínez-Velilla[1,4,5]

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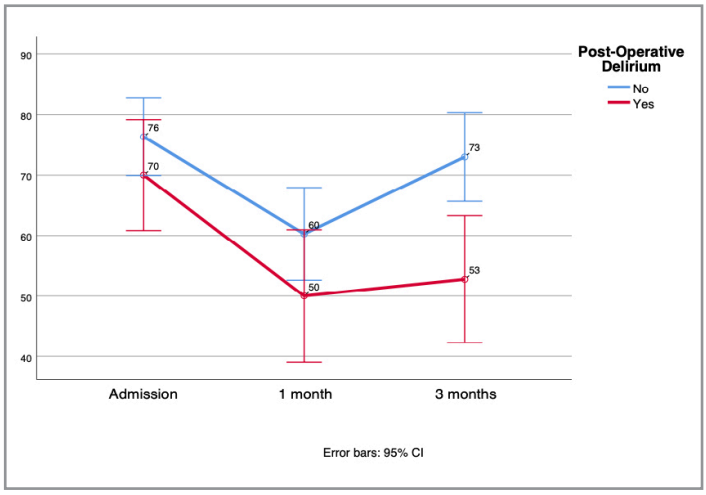
Background: Postoperative delirium (POD) is a common complication in geriatric patients after surgery and its occurrence is associated with poor outcomes. The aim of this study was to evaluate and compare the quality of life (QOL) and the functional and cognitive status of patients with and without POD after hip fracture surgery in a study with 1-and 3-month follow-up.

Materials and Methods: 60 hip fracture patients aged 75 or older without delirium at admission were recruited at Hospital Universitario de Navarra (Pamplona, Spain). Baseline characteristics and geriatric syndromes were assessed at admission and POD was determined daily using the 4-AT tool. A telephone follow-up at 1 and 3 months after discharge was undertaken to evaluate QOL (EuroQoL-5D), function (Barthel Index), and cognitive status (Informant Questionnaire on Cognitive Decline in the Elderly short form-IQCODE-sf total score). Repeated measures ANOVA was used to identify significant (P<0.05) within-subjects effects for the interaction POD timepoint.

Results: 21 patients developed POD and 39 did not. Patients with POD had worse outcomes at 1- and 3-month follow-up. QOL was 70 vs. 76 on admission, 50 vs. 60 at 1 month and 53 vs. 73 at 3 months (P=0.035); Barthel was 81 vs. 89 on admission, 45 vs. 61 at 1 month and 54 vs. 68 at 3 months (p=0.288); IQCODE-sf was 60 vs. 52 on admission, 63 vs. 53 at 1 month and 63 vs. 54 at 3 months (P=0.044).

Conclusions: POD after hip fracture surgery was associated with significantly worse quality of life and cognitive impairment 3 months after discharge compared to older adults who did not developed POD. These results emphasize the importance of a correct prevention, detection and management of POD in older surgical patients.



OC 13 Figure 1.

OC 14 – ID 396

RANDOMISED DOUBLE-BLIND, PLACEBO-CONTROLLED PHASE III TRIAL OF ORAL MELATONIN FOR THE PREVENTION OF DELIRIUM IN HOSPITAL IN PEOPLE WITH ADVANCED CANCER

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On behalf of Cancer Symptom Trials - melatonin delirium prevention trial group

Background: Delirium is highly prevalent in advanced cancer. Delirium causes significant symptom burden, high levels of patient and carer distress, morbidity, and mortality. Non-pharmacological delirium prevention strategies may be unachievable for some people with advanced cancer so alternative strategies are needed. Melatonin has shown promise as a safe preventative agent in other populations.

Aim: The primary objective was to determine if oral prolonged release melatonin compared to placebo

can increase the number of delirium-free days during hospitalisation of advanced cancer patients.

Methods: Prospective, randomised, double-blind, placebo-controlled, parallel-arm, multicentre phase III trial of oral prolonged release melatonin 2mg versus placebo taken each night during inpatient oncology or palliative care admission commenced within 48 hours of admission. Participants were adults with a diagnosis of advanced cancer who did not have delirium on admission and could take medication orally. The primary endpoint was delirium-free days. Delirium was defined as a Delirium Rating Scale-R-98 score of 17.75 or more.

Results: The study recruited to its full sample size (melatonin arm n=110, and control n=111) (mean age 68.8 years, 50.7% male). The majority (84.5%) had been admitted for symptom control. Median delirium free survival was not reached (95% Confidence interval 28 - not reached). The mean (SD) delirium free days in the melatonin arm was 13.4 days (45.3) and in the placebo arm 11.7 days (35.1) (p=0.75).

Conclusions: Delirium free days were higher in those who received melatonin, but this did not reach statistical significance. Further studies are needed to explore whether benefits are seen in selected higher risk patient groups or with higher doses.

Source of Funding Priority-driven Collaborative Cancer Research Scheme, Cancer Australia APP1127727

OC 15 – ID 401

EIGHT YEAR FOLLOW-UP OF AN OBSERVATIONAL COHORT OF POSTOPERATIVE DELIRIUM IN AN OLDER ELECTIVE ARTHROPLASTY POPULATION – PRELIMINARY COGNITIVE OUTCOMES

Sweeney A.M.[1], Passmore A.P.[1,2], Beverland D.[2], McGuinness B.[1,2], McAuley D.F.[4], Mawhinney T.[2], O'Brien S.[3], Schott J. M.[5], Zetterberg H.[6,7,8,9], Cunningham E.L.[1,2]

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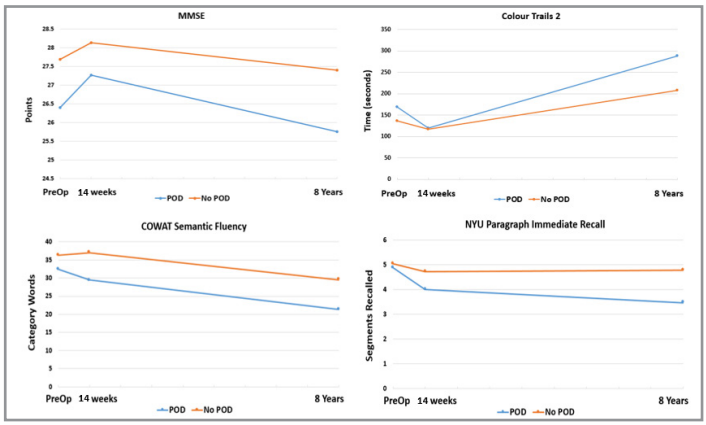
Background/Aims: In 2012-2014, an observational cohort study of postoperative delirium (POD) in an elective arthroplasty population recruited 315 individuals without a diagnosis of dementia aged over 65. Pre-operatively participants underwent cognitive assessments and had plasma and cerebrospinal fluid (CSF) were sampled. These cognitive assessments were repeated 14 weeks postoperatively. The current follow-up study aims to determine what effect POD has on cognition eight years later.

Materials and Methods: In spring 2021, n=264 surviving participants were contacted; n=172 participants completed telephone interviews, n=92 declined. In-person follow-up visits commenced in July 2021. Study visits replicated pre-operative cognitive assessments. Change in test scores were calculated and compared between those who developed POD at baseline and those who did not using Mann Whitney U tests.

Results: At the conclusion of data collection in June 2022, n=139 participants completed in-person follow-up reviews, n=57 had died and n=119 declined to complete in-person follow-up assessments. Those who declined were no more likely to have had delirium at baseline. People who consented or declined an in-person visit did not differ in age at surgery, preoperative Mini Mental State Examination (MMSE), Charlson comorbidity index, years in education or CSF Aβ42, total or phospho-tau. They did however differ in preoperative activities of daily living (p=0.007), IQ (p=0.03) and several cognitive tests, for example colour trails 2 (p=0.02). Generally, those who declined performed worse pre-operatively. People who developed POD at baseline (n=16) had significantly greater decline over the subsequent eight years on Colour Trails 1 (p=0.01); Colour Trails 2 (p=0.04); semantic fluency (p=0.04) and NYU Paragraph Immediate Recall (p=0.03).

Conclusions: At eight-year follow-up, most participants are alive although a significant minority declined to take part. People who developed delirium postoperatively displayed greater decline on a number of executive function and recall tests over the subsequent eight years.



OC 15 Figure 1. Performance on the Mini Mental State Examination (MMSE), Colour Trails 2, Controlled Oral Word Association Test (COWAT) of semantic fluency and the New York University (NYU) by those who developed POD (n=16) and those who did not (n=123) at three time-points – preoperatively, fourteen weeks post-operatively and eight year follow-up.

PO 01 – ID 412

A PROSPECTIVE MULTICENTER CLINICAL VALIDATION STUDY OF DELTASCAN FOR THE ASSESSMENT OF ACUTE ENCEPHALOPATHY AND DELIRIUM IN ICU AND NON-ICU PATIENTS

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Background/Aims: Acute encephalopathy (AE), which presents clinically as delirium, is characterized in EEG by arrhythmic slow waves known as polymorphic delta activity (PDM). It can be detected with single-channel electroencephalography (EEG, Fp2-Pz). To deliver an objective brain monitoring tool suitable for routine daily care, a self-functional device is needed that provides health care workers with an AE and/or delirium probability score within several minutes. We evaluated the performance of DeltaScan, a portable self-functioning brain state monitor.

Methods: This prospective cross-sectional multicentre study included patients from 6 ICU and 15 non-ICU-departments from 9 different Dutch hospitals. Participants underwent a 4-minute resting-state eyes closed DeltaScan measurement using the portable EEG monitor. A built-in automated algorithm that was previously trained and calibrated on two independent datasets, selected the first 96 seconds of artefact-free data and subsequently detected the amount of PDA using wave shape analyses. Detection of PDA was translated to probability score ranging from 1 (highly unlikely) to 5 (highly likely). We compared DeltaScan results with the diagnosis of AE based on visual inspection of three EEG experts (neurophysiologists) and with the diagnosis of delirium based on evaluations of three clinical experts (e.g. psychiatrists, geriatricians).

Results: Of the 636 enrolled patients, we included 487 of whom 54% male, a mean age of 73.2 years (SD = 13) and of which 45% were admitted to the ICU-department. DeltaScan achieved an AUC of 0.86 for AE and 0.72 for delirium. When comparing positive results (DeltaScanScore 3-5) and negative results (DeltaScanScore 1-2) we found a sensitivity of 76% for AE and a specificity of 86%. Sensitivity and specificity for delirium were 65% and 70%, respectively. Specificity within another 84 non-delirious hospitalized psychiatric patients was 94%.

Conclusions: The fully-automated DeltaScan Monitor can accurately provide the probability of AE, clinically manifesting as delirium, within several minutes.

Clinical Trial Identifier: NCT03966274

Funding: This work was supported by European Union Horizon 2020 [grant number 820555].

Disclosure statement: The sponsor and Prolira, had no role in the study design, data analysis, data interpretation, or the decision to submit for publication.

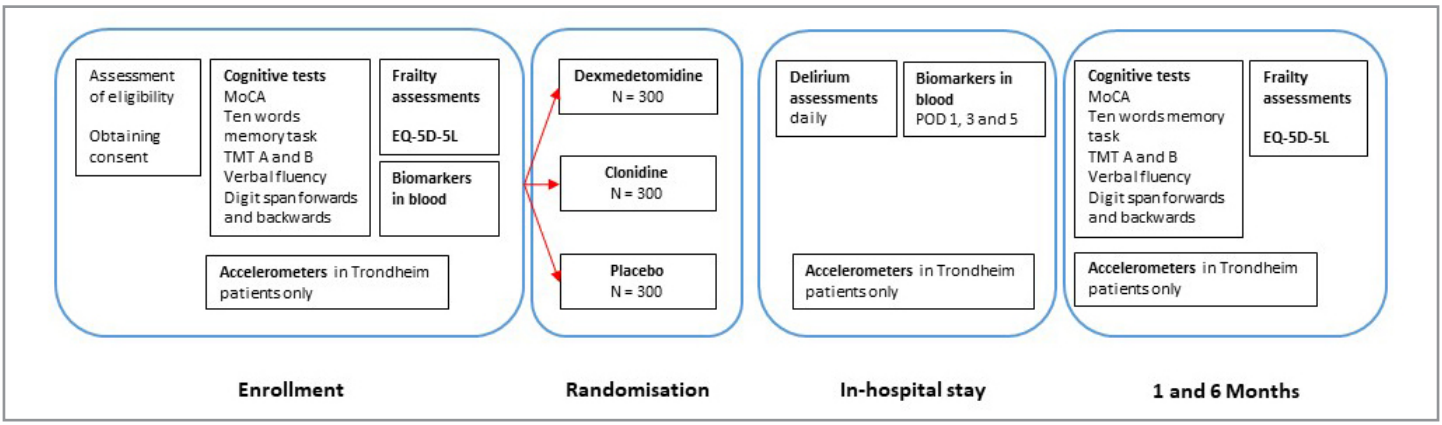
PO 02 – ID 308

ALPHA-2-ADRENERGIC RECEPTOR AGONISTS FOR THE PREVENTION OF DELIRIUM AND COGNITIVE DECLINE AFTER OPEN HEART SURGERY (ALPHA2PREVENT): PROTOCOL FOR A MULTICENTRE RANDOMISED CONTROLLED TRIAL

Bjørn Erik Neerland

Oslo Delirium Research Group, Department of Geriatric medicine, Oslo University Hospital, Oslo, Norway
on behalf of all ALPHA2PREVENT researchers

Background/Aims: Postoperative delirium is common in older cardiac surgery patients and associated with negative short-term and long-term outcomes. The alpha-2-adrenergic receptor agonist dexmedetomidine shows promise as prophylaxis and treatment for delirium in intensive care units (ICU) and postoperative settings.



***PO 02** Figure 1.*

Clonidine has similar pharmacological properties. We aim to study whether repurposing of clonidine can represent a novel treatment option for delirium, and the possible effects of dexmedetomidine and clonidine on long-term cognitive trajectories, motor activity patterns and biomarkers of neuronal injury, and whether these effects are associated with frailty status.

Materials and Methods: This five-centre, double blind randomised controlled trial will include 900 cardiac surgery patients aged 70+. Participants are randomized 1:1:1 to dexmedetomidine or clonidine or placebo. The study drug is given as a continuous intravenous infusion from the start of cardiopulmonary bypass, at a rate of 0.4 Qg/kg/h. The infusion rate is decreased to 0.2 Qg/kg/h postoperatively and is continued until discharge from the ICU or 24 hours postoperatively, whichever happens first.

Results: Inclusion started 17.1.22. Primary endpoint is the 7-day cumulative incidence of postoperative delirium (DSM-5). Secondary endpoints include the composite endpoint of coma, delirium or death, in addition to delirium severity and motor activity patterns, levels of circulating biomarkers of neuronal injury, cognitive function and frailty status 1 and 6 months after surgery.

Conclusions: This trial will provide evidence for prophylactic efficacy of dexmedetomidine and clonidine in reducing the incidence of postoperative delirium as well as decline in cognitive function 1 and 6 months postoperatively. Inclusion of preoperative frailty assessments will provide evidence for frailty as a predictive marker of treatment effect. The analysis of biomarkers will provide insights into the neural mechanisms in postoperative delirium and long-term cognitive dysfunction. The analysis of activity by accelerometers will provide insight into motor activity patterns in subtypes of delirium.

PO 03 – ID 326

ASSOCIATION OF ICU DELIRIUM WITH COGNITIVE FUNCTION AFTER HOSPITAL DISCHARGE AMONG COVID-19 SURVIVORS

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Background/Aims: The Johns Hopkins Post-Acute COVID Team (PACT) clinic cares for COVID-19 survivors with persistent symptoms. The goal of this study was to examine the association of ICU delirium with cognition after hospital discharge among PACT patients.

Materials and Methods: PACT patients were administered a battery of cognitive tests by phone (T-Cog) an average of four months after hospital discharge. Those who had both Confusion Assessment Method (CAM-ICU) assessments (N=62) in ICU and later T-Cog assessments were included in the analysis. Outcomes included processing speed [Oral Trails A, Letter Fluency] and Category Fluency. The composite was calculated as the mean of the standardized scores for trails A, letter verbal fluency, and category verbal fluency. The individual measures and the composite were compared between those who did and did not have delirium during hospitalization via t-tests. The analyses were done in STATA v17.0.

Results: Mean participant age was 61 years (SD=12.6), 50% female, 50% Black. Participants with in-hospital delirium (62% (38/62)) had longer lengths of stay [37.4 (25.7) vs. 12.5 (6.9) days, p<0.001] and were more likely to require mechanical ventilation [79% (30/38) vs. 8% (2/24), p<0.001] compared to those without delirium. Participants with in-hospital delirium performed better on Letter Fluency [84.7(17.7) vs. 95(10.7), p=0.008]. There were no significant differences in other cognitive measures. In multivariable analysis, adjusted for age, sex, race, and ethnicity, delirium was not associated with the composite scores [β=1.87 (3.1), n.s].

Conclusions: PACT patients with delirium performed better on Letter Fluency test. One of the limitations of this study is that PACT patients on ventilators during their ICU stay were less likely to undergo T-Cog assessment, which may have created a selection bias. Currently, we are conducting 6- and 12- month follow-up studies, which may give a better understanding of the delirium on long-term cognition.

PO 04 – ID 332
UTILITY OF A NATIONAL EARLY WARNING SCORE SYSTEM IN UK (NEWS2) FOR DELIRIUM DETECTION

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Background/Aims: The NEWS2 is an aggregate early warning scoring system to identify acutely unwell patients, calculated from routinely collected physiological measurements, developed in 2012 by the Royal College of Physicians and updated to include new confusion in 2017. In this study we sought to assess the sensitivity of the NEWS2 for non-alert states for a 4AT score of 4 or above, indicating probable delirium, as a primary outcome.
Methods: All non-elective admissions aged 65 years and over to Salford Royal hospital between 1st March 2020 and 30th March 2022 were included, where at least one 4AT was completed within 24 hours of first attendance, and at least one NEWS2 assessment occurred within 4 hours either side of this delirium screen. All analyses were conducted using R.
Results: The analysis population included 13,908 consecutive admissions. There were 2,802 (20%) admissions with a 4AT≥4 consistent with probable delirium. A total of 594 (4.3%) admissions had a non-alert recorded on NEWS2. The sensitivity of a NEWS2 non-alert assessment for a 4AT≥4 was 17.8% (95% confidence interval [CI] 16.4%–19.2%), with a specificity of 99.1% (95% CI 98.9%–99.3%). The alertness question on the 4AT identified 980 (7%) of admissions with 'clearly abnormal' arousal and 825 (6%) with 'mild sleepiness'. Of the patients classed as 'clearly abnormal' arousal, 70.8% were assessed on NEWS2 as alert and of patients classed as 'mild sleepiness', 88.5% were assessed as alert.
Conclusions: Our analysis shows that NEWS2 has low sensitivity but high specificity for probable delirium based on 4AT scoring. Of those assessed as having clearly abnormal arousal on 4AT more than three quarters of these were assessed as being alert on the NEWS2. This single centre study shows that NEWS2 alone is not reliable for delirium detection.

PO 05 – ID 333
A DELIRIUM TOOLKIT IS ACCEPTABLE TO HEALTHCARE STAFF WORKING IN COMMUNITY TEAMS

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Background/Aims: There is increasing demand for delivery of healthcare in the community. The Greater Manchester (GM) community delirium toolkit was developed and was successfully piloted by four teams between August 2020 and January 2021. In this study we sought to explore the opinions of healthcare workers working in community teams on the implementation and content of the community delirium toolkit, gaining insights that might assist other community teams.
Methods: A qualitative evaluation with healthcare professionals working with teams with the highest level of adoption of the toolkit were approached, with a total of 8 healthcare professionals from 4 teams. Questions around implementation provided a natural structure for thematic coding.
Results: Four main themes emerged around the community delirium toolkit . (1) set-up, (2) usage (3) opinion of toolkit and leaflet, and (4) the wider dissemination. Example quotes are in Table 1.
Set up: Teams were provided with an initial launch meeting with support around issues of governance and implementation. The sites then took a 'train the trainer' approach, aiming to train all members of the team at all grades/levels.
Usage: Teams acknowledged that the toolkit helped them to recognize delirium cases earlier, decreasing time spent on subjective decision making. As a result of increased knowledge and awareness, a delirium diagnosis was considered for patients earlier in the pathway than previously.
Opinion: Teams appreciated that the toolkit took the evidence around delirium assessment and management and turned it into an easy to remember, simple to use, practical tool.
Dissemination: All teams attempted to disseminate the

Theme	Quote from Interview
Set up	*The information I've received, I don't think it could have been done any other way so I do feel that was a good method. (G1)*
Usage	*I think we are recognising delirium quicker and therefore we're able to make changes to try and reverse it a little bit quicker. (F1)*
Opinion	*But the feedback's been really good from the patients that I've heard, and the staff have said. So, they have…it's the only information that they've ever been given about delirium. (I2)*
Dissemination	*I think it is a very useful toolkit that potentially could be rolled out to care homes who are there all the time.(G1)*

***PO 05** Table 1.*

toolkit to other services, their quality boards, or long-term care homes.

Conclusions: The GM community delirium toolkit was easy for the teams who participated in the pilot to use and adopt. Key enablers were development of a co-produced toolkit and project management with sharing of resources.

PO 06 – ID 334

DELIRIUM ASSESSMENT USING THE 4AT TEST IN NON-ENGLISH SPEAKING PATIENTS

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Background/Aims: Delirium identification at the earliest opportunity on admission to hospital is important. A significant number of users of the UK National Health Service do not speak English as first language which can create language barriers and missed or misdiagnosis. This study explores how the 4AT delirium test is utilised in one hospital in North West England in non-English speaking patients. The use of translators during the 4AT assessment for these patients was also studied.

Methods: A list of all non-English speaking non-elective admissions aged 65 years and over, for Salford Royal Hospital from 2/11/21 until 27/4/22 was generated. The study was approved as an audit by the hospital. In total there were 16 different languages spoken, with Urdu being the most prevalent followed by Polish and then Arabic. Whilst the 4AT has been translated into various languages, it has not yet been translated into any of these languages.

Results: Only 22 out of 76 patients episodes (29%) had the 4AT completed on admission. In 17 of 22 episodes an interpreter was present, however 13 of these interpreters were lay. This compares to 42% of all non-elective episodes for patients aged 65 years and over who had the 4AT on admission during the same time period.

Conclusions: Patients who do not speak English have an assessment using the 4AT in less than a third of cases. We found that healthcare interpreters were not used in the majority of cases and we found no cases documenting the use of a translation of the 4AT. National guidelines make it clear that all attempts should be made to provide patients with an interpreter, and this is the responsibility of healthcare providers. There is much room for improvement, including raising awareness, so that more patients who do not speak English have a delirium assessment.

PO 07 – ID 340

DELIRIUM INCREASES IN-HOSPITAL AND POST-DISCHARGE MORTALITY IN COVID-19 PATIENTS: THE FRACOVID MULTICENTER PROSPECTIVE STUDY

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Background/Aims: Delirium is a common feature in COVID-19 patients. Although its association with in-hospital mortality has previously been reported, scarce results concern post-discharge mortality and delirium subtypes. We evaluated the association between delirium and its subtypes and both in-hospital and medium-term mortality.

Materials and Methods: This is a multicenter longitudinal

clinical-based study settled in Monza and Brescia, Italy. 1324 patients (median age: 68) with COVID-19 admitted to four acute clinical wards in Northern Italy during the first and second pandemic waves. Delirium was assessed through validated scores and/or clinical assessment. The association between the presence of delirium - and its subtypes- and in-hospital and medium-term mortality was evaluated through Cox proportional hazards models. The study protocol is registered with Clinicaltrials.gov under the number: NCT04412265.

Results: 223 patients (16.8%) presented delirium within 24-48 hours of hospital admission. Those with delirium had around a two-fold increased risk of in-hospital (HR=1.94, 95%CI: 1.38, 2.73) and medium-term mortality (HR=2.01, 95%CI: 1.48, 2.73) than those without delirium. All delirium subtypes were associated with greater risk of death compared to the absence of delirium, but hypoactive delirium revealed the strongest associations, with both in-hospital (HR=2.03, 95%CI: 1.32, 3.13) and medium-term mortality (HR=2.22, 95%CI: 1.52, 3.26).

Conclusions: In patients with COVID-19, delirium at hospital admission is not only associated with in-hospital mortality but also with shorter post-discharge survival. This suggests that delirium might be a marker of disease severity and/or patient vulnerability. Its detection and management are crucial to improving the clinical prognosis of COVID-19 patients.

PO 08 – ID 349

INFLUENCES ON DELIRIUM SCREENING FOR PATIENTS WITH DEMENTIA IN ACUTE HOSPITALS: POOLED DATA FROM A NATIONAL AUDIT OF 900 ADMISSIONS IN IRELAND

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Background/Aims: It is crucial that delirium is detected in acute hospitals, but staff compliance with screening can be challenging in this busy environment. We examined factors that influenced delirium screening in hospitalised patients with dementia, using data from the Second Irish National Audit of Dementia care in acute hospitals (INAD-2).

Materials and Methods: Retrospective anonymous audit data from 30 hospitals within the Republic of Ireland was analysed, included cases had dementia (any age, any speciality) and stayed in hospital for ≥3 days. Initially univariate and then multivariate logistic regression analysis assessed the impact of six key dementia resources on delirium screening: a dementia quality improvement (QI) team, a dementia care pathway/bundle, ≥1 dementia specific clinicians, dementia champions, in-patient care on a geriatric ward, and staff dementia awareness training. Other variables such as patient age, sex, length of stay, main reason for admission, and the hospital level (size) were included in the models.

Results: Of the 893 included cases, 19.7% had delirium screening performed, ranging from 0% (n=10 hospitals) to 100% (one hospital). Where performed, the most common tool was the 4AT (76.4%) then the Single Question in Delirium (19%), Months of the Year Backwards (4%) and the Confusion Assessment Method (n=1). Of those screened (n=175), 11.5% were positive. Many factors influenced delirium screening performance (Dementia QI group OR 2.9, Dementia champions OR 2.2, geriatric ward care OR 2.1). However, the independent influencers were staff dementia awareness training (aOR 14.0, 95% Confidence Interval 1.6-120.4), a dementia pathway/bundle (aOR 3.0, 95% CI 1.9-4.9) and dementia being the primary cause of admission (aOR=1.2, 95% CI 1.1-1.3).

Conclusions: This study highlights the role of dementia pathways and staff dementia awareness training, and to a lesser degree QI groups and champions, in positively influencing delirium screening practice for people with dementia in acute hospitals.

PO 09 – ID 350

AD NEUROPATHOLOGY AND DELIRIUM IN HIP FRACTURE PATIENTS WITHOUT PRE-FRACTURE DEMENTIA

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Background/Aims: Alzheimer's disease (AD) neuropathology is defined by amyloid-beta plaques (A), neurofibrillary tangles (T) and neurodegeneration (N). These changes precede the symptomatic presentation of the disease. People with AT pathology without symptomatic presentations may be categorized as having preclinical Alzheimer's disease. The aim of this study was to explore if the Alzheimer's disease neuropathology is associated

with delirium in hip fracture patients without pre-existing dementia.

Materials and Methods: The cerebrospinal fluid (CSF) concentrations of amyloid-beta$_{1-42}$ (Abeta42), amyloid-beta$_{1-40}$ (Abeta40) and phosphorylated tau$_{181}$ (p-tau) were determined in hip fracture patients without pre-fracture dementia (n=236). The Abeta42/40 ratio and p-tau were used to determine A and T status, respectively.

Results Hip fracture patients with delirium had compared to those without delirium higher CSF concentrations of Abeta42 and p-tau and more were A+T+. The Abeta40 concentrations were similar between patients with and without delirium.

Conclusions: The findings indicate people without pre-fracture dementia but Alzheimer's disease neuropathology to be more vulnerable towards precipitation of delirium. Determination of preclinical AD by biomarkers may identify people with particular need of care at acute hospitalization.

PO 10 – ID 356

DEVELOPMENT AND VALIDATION OF AN INTERNATIONAL PREOPERATIVE RISK ASSESSMENT MODEL FOR POSTOPERATIVE DELIRIUM

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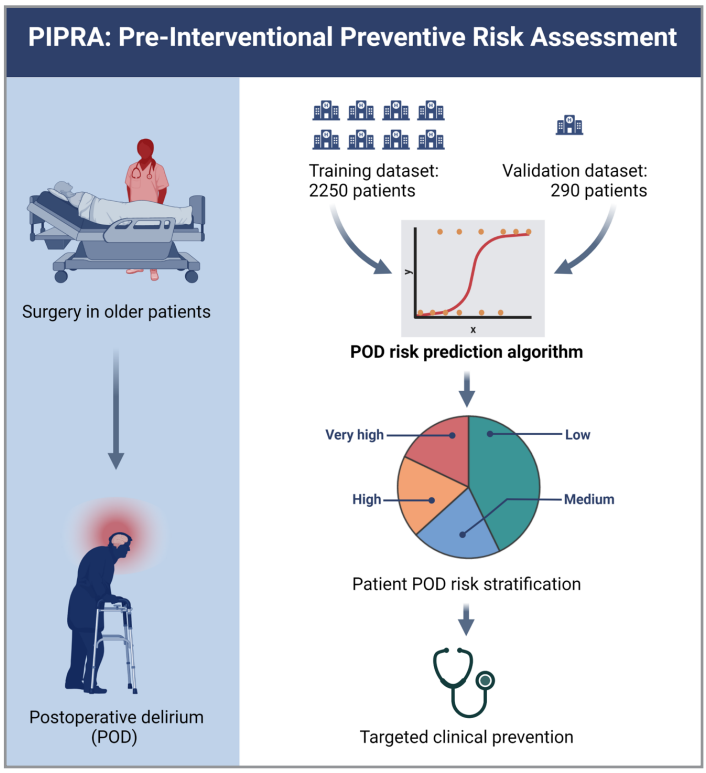
Background: Postoperative delirium (POD) is a frequent complication in older adults, characterized by disturbances in attention, awareness and cognition, and associated with cognitive decline, long-term dementia, poor functional recovery, prolonged hospitalization, and increased mortality. Early identification of patients at risk of POD can considerably aid prevention.



PO 10 Figure 1.

Aim: To create a POD risk prediction algorithm for use in clinical practice.

Methods: We developed a POD risk prediction algorithm based on age, body mass index, American Society of Anaesthesiologists (ASA) score, history of delirium, cognitive decline, medications, optional C-reactive protein (CRP), surgical risk and whether the operation is a laparotomy/thoracotomy, all information commonly available in clinical practice. The algorithm was trained on clinical data from 2250 patients (444 with POD) from eight studies and externally validated on a dataset of 290 patients (61 with POD).

Results: The algorithm has a cross-validation area under the receiver operating characteristic curve (AUC ROC) of 0.80 (95% CI: 0.77-0.82) with CRP and 0.79 (95% CI: 0.77-0.82) without CRP, as well as an AUC of 0.76 (95% CI: 0.69-0.83) from the validation dataset, indicating high robustness. Based on the predicted risk, sensitivity and specificity, patients are divided into four sub-groups, with regards to their risk of developing POD as low, medium, high and very high.

Conclusions: The algorithm has CE certification, is available at http://pipra.ch/ and allowed for clinical use. It can be used to optimise patient care and prioritise interventions for vulnerable patients, and presents an effective way to implement POD prevention strategies in clinical practice.

Conflicts of interest and source of funding:
NG has received consultancy fees from PIPRA AG (Zurich, Switzerland). BTD and NSG are founders and employees of PIPRA AG. LF was an employee of PIPRA AG (Zurich, Switzerland). BTD, NSG, LF and NG are shareholders of PIPRA AG. The remaining authors have no conflict of interest to

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PO 11 – ID 364

TOOLS TO ASSESS DELIRIUM KNOWLEDGE AMONG HEALTH CARE WORKERS: PRELIMINARY RESULTS OF A LITERATURE REVIEW

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Background/Aims: Delirium is a negative health outcome which affects hospitalized adults and children and reaches a prevalence of 70% in long term care facilities (de Lange et al., 2013). Delirium recognition is related to the knowledge of the health care personnel. Measurement of delirium knowledge (DK) is common, but little is known about how it is assessed. We aimed to identify existing tools used to assess DK among health care workers.

Materials and Methods: a systematic search of Medline, Embase, CINHAL, Scopus, PsycINFO was performed to include studies that measure knowledge/awareness of delirium from 2000 to 2022.

Results: After removing duplicates, 87 studies were assessed for eligibility. Studies were conducted in America (41.7%), Europe (23.8%) and Asia (20.8%). DK was mainly evaluated on nurses (61.1%) and physicians (13.4%), a minority involved other health care workers. The most investigated personnel worked in critical care area (38.8%), the lowest in long-term care (5.9%). Self-developed tools, structured as surveys and/or vignettes were the most used/employed (65.6%), followed by (modified) versions of the Delirium Knowledge Questionnaire (Hare et al., 2008). Validation data regarding the identified tools are lacking.

Conclusions: Despite the DK is perceived as important worldwide, shown by the numerous measurement scales available, there is a great disparity between hospital and long-term care settings. Nurses and physicians are the most involved in surveys, but the use of self-developed tools generates great variability. In addition, the lack of data on the tools validity makes it difficult to compare the measured outcome, delirium knowledge. Using validated instruments and investigating more in non-hospital care settings would provide a more complete overview of the situation, health personnel lack of knowledge and their educational needs.

PO 12 – ID 368

DURATION OF SURGERY AND INTRAOPERATIVE BLOOD PRESSURE MANAGEMENT ARE MODIFIABLE RISK FACTORS FOR POSTOPERATIVE NEUROCOGNITIVE DISORDERS FOLLOWING SPINE SURGERY IN ELDERLY PATIENTS: RESULTS OF THE PROSPECTIVE CONFESS OBSERVATIONAL STUDY

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Background/Aims: Advances in spine surgery enable technically safe interventions in elderly patients with disabling spine disease but perioperative neurocognitive disorders (NCD) remain a concern. This study aims to investigate predefined modifiable risk factors for postoperative delirium (POD), and its interaction with postoperative cognitive dysfunction (POCD)/persistent NCD.

Methods: This prospective single-center study recruited patients aged ≥60 years and scheduled for elective spine surgery between 02/2018 and 03/2020. The primary hypothesis was that duration of surgery is a significant predictor for POD. Further surgical and anesthetic procedures were investigated as secondary predictors. Functional (Barthel Index, BI) and cognitive outcomes (CERAD test battery, telephone MoCA) were assessed at baseline, three (V3) and twelve (V4) months postoperatively.
Results: 22% of patients suffered POD (n=22/99). In a multivariable model, duration of surgery (OR=1.61/hour [95%CI:1.20-2.30]), age (OR=1.22/year [95%CI:1.10-1.36]), and intraoperative systolic blood pressure (sBP) (25th percentile: OR=0.94/mmHg [95%CI:0.89-0.99], 90th percentile: OR=1.07/mmHg [95%CI:1.01-1.14]) were independent predictors of POD. Postoperative cognitive scores improved on a group-level (V3, CERAD mean z-score:+0.2230.63), yet POCD developed in patients who suffered POD (beta:-0.87 [95%CI:-1.31--0.42]), were older (beta:-0.29 [95%CI:-0.05--0.01]), or when there was no functional gain (BI change, beta:+0.04 [95%CI:+0.02-0.06]). Cognitive scores at 12 months remained inferior in the POD group adjusted for age and preoperative cognitive abilities.
Conclusions: This study yielded modifiable risk factors for POD, which again is an independent risk factor of POCD and persistent NCD. Postoperative cognitive function might improve in younger patients with a functional gain.

Clinical Trial Registration: Prospectively registered NCT03486288

PO 13 – ID 381

DELIRIUM TRAJECTORIES IN OLDER PATIENTS HOSPITALIZED FOR HIP FRACTURES: RESULTS FROM THE GIOG MULTICENTER STUDY

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Background/Aims: Delirium is common in patients with hip fractures. Although several studies have investigated the occurrence of delirium before and after the time surgery, none of them has traced its longitudinal trajectories.
This study aims to identify and characterize delirium trajectories in surgically treated older people with hip fracture.
Materials and Methods: We used data collected from 12 centers belonging to the Gruppo Italiano di Ortogeriatria (GIOG), a multicenter network of orthogeriatric services in Italy, between April 2019 and April 2022. Baseline sociodemographic and clinical information, including preoperative health status and anesthesiologic and surgical details were collected. Delirium was evaluated daily (one preoperative and one-to-three postoperative timepoints) using the 4-AT. Functional status and mortality were also assessed at time of discharge and 120 days later. Group-based trajectory modelling was used to explore delirium trajectories around the time of surgery, and regressions were

used to characterize them in terms of sociodemographic and clinical factors.

Results: 1277 patients were enrolled. 76% of the participants were females and the median age was 84 years (IQR 79-89). Five different delirium trajectories were identified: 539 patients (42.2%) had mildly elevated 4-AT scores, 456 (42.2%) had persistently low 4-AT scores, 167 (13.1%) had persistently high 4-AT scores, 79 (6.2%) had transiently high postoperative 4-AT scores and 36 (2.8%) had increasing 4-AT scores. Age, presence of dementia, and motor-functional performances before fracture were significantly different among groups.

Conclusions: This study analyzes the longitudinal interindividual variability of delirium trajectories in older subjects with hip fracture through an innovative method. Better knowledge of delirium trajectories and their associated features will likely allow us to implement tailored strategies for improve the care of hip fracture patients.

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PO 14 – ID 383

FEASIBILITY AND POTENTIAL OF A POINT-OF-CARE EEG FOR DETECTING DELIRIUM SUPERIMPOSED ON DEMENTIA: RESULTS OF A PROSPECTIVE OBSERVATIONAL COHORT STUDY

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Background: Delirium superimposed on dementia (DSD) is difficult to diagnose because symptoms of delirium might be interpreted as symptoms of dementia. This diagnostic difficulty may negatively impact the counseling and treatment of patients with DSD.

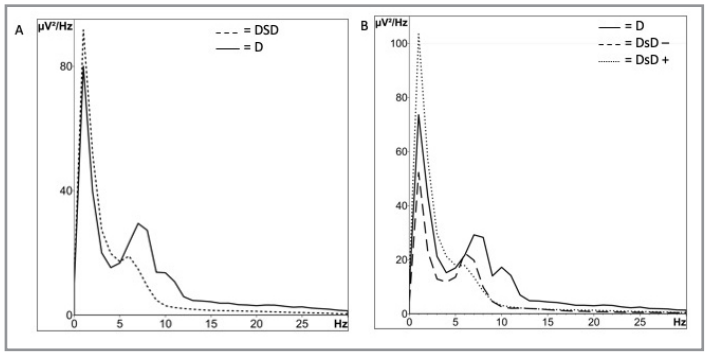
Aim: To improve diagnostic accuracy, we investigated the potential of a brief point-of-care EEG measurement in a prospective observational cohort study.

Methods: 30 older patients were included, all with Major Neurocognitive Disorder (i.e. dementia) according to DSM-5 criteria. EEG was registered at right prefrontal and right temporal site, with eyes either open or closed for three minutes, simultaneously with the Discomfort Scale for Dementia of Alzheimer Type. The CAM-ICU was administered to determine the presence of symptoms of a delirium at the time of EEG administration. Video registrations were reviewed independently by two delirium experts. They assessed attention based on the patient's performance on the CAM-ICU, but also on patient behavior during the CAM-ICU, e.g. distractibility.

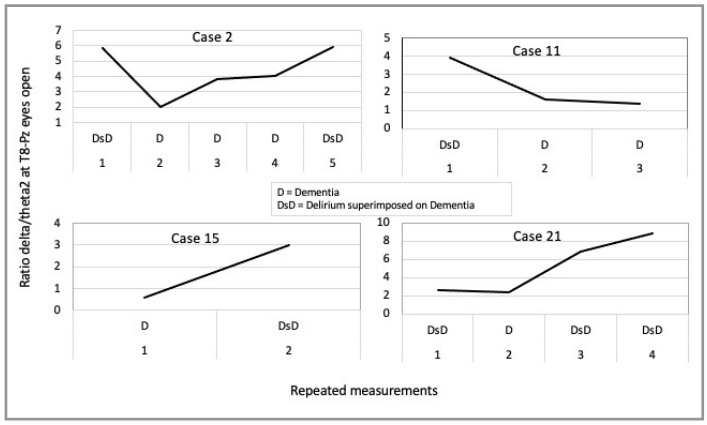
Results: Higher activities of delta and theta1, and lower activities of theta2, alpha, and beta activity, were found in DSD when compared to dementia only. Figure 1 shows the results of comparing patients without delirium (D) with patients who showed fluctuations (Figure 2) in delirium (DSD- and DSD+). It appeared that both DSD groups either with or without a delirium, significantly differed from patients with dementia who never developed a delirium. The ratio of delta and theta power during eyes-open conditions had the highest accuracy (AUC = 0.80 [0.63-0.94], p<.001) to distinguish DSD from dementia alone.

Conclusions: A brief point-of-care EEG at two sites of the head has the potential to aid in the detection of DSD. The diagnostic accuracy of EEG in recognizing or excluding

delirium in patients who already have dementia is of large potential given the lack of proper diagnostic tools.



PO 14 *Figure 1. Grand Averages of Power Density (V2/Hz) at T8-Pz, eyes open. A. Repeated measurements of two groups: only Dementia only and Dementia with Delirium B. Repeated measurements of three groups: patients with dementia who did not have delirium during their stay (group D), patients with only dementia yet also had periods with delirium during their stay (group DSD-), patients with dementia and an episode of delirium (group DSD+).*



PO 14 *Figure 2. Repeated measurements of four individual cases during their stay at the ward: Graphs show ratio of Delta/Theta2 at site T8-Pz during the eyes open condition.*

PO 15 – ID 388

EXPLORATION OF DELIRIUM MANAGEMENT PRACTICES AND ATTITUDES OF INTRAOPERATIVE STAFF CARING FOR PATIENTS UNDERGOING HIP FRACTURE REPAIR SURGERY

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Background/Aims: Individuals undergoing hip fracture repair surgery are at high risk of developing delirium. The intraoperative phase of treatment is pivotal to overall outcomes, despite this, the setting is largely absent from the literature on delirium management. The aim of this study was to explore the experience of nursing & medical staff caring for patients undergoing hip fracture repair who are experiencing delirium in the intraoperative area.

Materials and Methods: Participants included intraoperative nursing staff from holding-bay and recovery-unit as well as orthopaedic surgeons and anaesthetics. Data was collected from semi-structured interviews. The study was a single centre study based a tertiary Hospital in Queensland, Australia. The study was informed by the Theoretical Domains Framework. Semi structured interview questions focused on participant experiences during their care of the person undergoing hip fracture repair with delirium in an intraoperative setting. Data was inductively analysed using thematic analysis.

Results: A total of 10 participants were interviewed. Four themes arose from the thematic analysis they were as follows 1) reactive approach to delirium management 2) underlying beliefs influencing therapeutic relationship 3) practical strategies to manage delirium symptoms and 4) communication diffusion impairs multidisciplinary approach.

Conclusions: Staff working in this setting highlighted improvised strategies to manage symptoms. However, the underlying perceptions staff had led to an expectation of delirium which may undermine the therapeutic relationship. Ad hoc communication may impede establishing cognitive baseline for people undergoing hip fracture repair. Barriers and facilitators to implementation of best practice delirium management guidelines should be further examined. Additionally, deeper examination of the root causes of the emotional responses of staff to the patient experiencing delirium and its effect on the therapeutic relationship is warranted.

PO 16 - ID 397

MUSIC-INTERVENTIONS AND DELIRIUM IN ADULTS: A SYSTEMATIC LITERATURE REVIEW AND META-ANALYSIS

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Background/Aims: Delirium is a neuropsychiatric syndrome represented by an acute disturbance in attention, awareness and cognition, highly prevalent in older, and critically ill patients, and associated with poor outcomes. This review synthesized existing evidence on the effectiveness of music interventions on delirium in adults, and music interventions (MIs), psychometric assessments and outcome measures used.

Materials and Methods: We searched MEDLINE, PsychINFO, SCOPUS, Clinical Trials and CENTRAL for quantitative designs comparing any MIs to standard care or another intervention. From 1150 studies 12 met the inclusion criteria, and 6 were included in the meta-analysis.

Results: Narrative synthesis showed that most studies focused on prevention, few assessed delirium severity, with the majority of studies reporting beneficial effects. The summary relative risk for incident delirium comparing music vs. no music in postsurgical and critically ill older patients was 0.52 (95% confidential interval (CI): 0.20-1.35, I^2 = 79.1%, heterogeneity &lt,0.0001) for the random effects model and 0.47 (95% CI: 0.34-0.66) using the fixed effects model. Music listening interventions were more commonly applied than music therapy delivered by credentialed music therapists, and delirium assessments methods were heterogeneous, including both standardized tools and systematic observations.

Conclusions: Better designed studies are needed addressing effectiveness of MIs in specific patient subgroups, exploring the correlations between intervention-types/dosages and delirium symptoms.

PO 17 – ID 404

THE DELIRIUM INTERVIEW: A NOVEL APPROACH AS REFERENCE STANDARD TO TEST DELIRIUM ASSESSMENT TOOLS

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Aim: To develop and validate a new DSM-5-based reference method for delirium assessment tools, the Delirium Interview.

Background: The reference standard in studies on delirium assessment tools is usually based on the clinical judgement of only one delirium expert, unstandardized, very concise or not specified at all. It appears to be logistically challenging to organize that two (or more) experienced delirium experts examine patients together, especially for large cohorts.

Methods: In this multicentre study, we compared paper-based evaluation of the Delirium Interview with live assessment of patients. Live assessments of our 10-minute standardised Delirium Interview were done by a well-trained researcher and two delirium experts. Paper-based assessments of the Delirium Interview were done by three other delirium experts. The complete panel consisted of 13 independent delirium experts with an average of 13 years (standard deviation (SD) 8) of clinical experience.

Results: We included 98 patients (62% male, mean age 69 SD 12), of which 56 were admitted at intensive Care Units (ICU, 46% voiceless) and 42 at non-ICU wards. The prevalence of delirium was 28%. Paper-based evaluation of the Delirium Interview had a sensitivity of 0.89 (95% confidence interval (CI)= 0.71-0.98) and specificity of 0.82 (95%CI= 0.71-0.90), compared to the diagnosis of experts who examined the patients themselves. Negative predictive value and positive predictive value were 0.95 (95%CI=0.86-0.99) and 0.66 (95%CI=0.49-0.80) respectively. Stratification into ICU and non-ICU patients yielded similar results. Interrater reliability appeared moderate for the final diagnosis of delirium (κ= 0.46, 95%CI= 0.35-0.58).

Conclusions: We introduce a new reference method to be used for evaluation of delirium assessment tools that is efficient and applicable for large scale studies in ICU and non-ICU patients. Our results show a high performance but confirm known disagreement in delirium classification. Therefore, we recommend that reference panels consist of more than one expert.

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Declaration of interests: None of the other authors reports any conflicts of interest

PO 18 – ID 408

DISTRIBUTION OF DELIRIUM MOTOR SUBTYPES IN THE INTENSIVE CARE UNIT: A SYSTEMATIC SCOPING REVIEW

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Background: Delirium is the most common cerebral dysfunction in the intensive care unit (ICU) and can be subdivided into a hypoactive, hyperactive, or mixed motor subtype based on the clinical manifestation. The aim of this review was to describe the distribution, pharmacological interventions, and outcomes of delirium motor subtypes in ICU patients.

Methods: This systematic scoping review was performed according to the PRISMA-ScR and Cochrane guidelines. We performed a systematic search in six major databases to identify relevant studies. A meta-regression analysis was performed where pooled estimates with 95% confidence intervals were computed by a random effect model.

Results: We included 131 studies comprising 13,902 delirious patients. There was a large between-study heterogeneity among studies, including differences in study design, setting, population, and outcome reporting. Hypoactive delirium was the most prevalent delirium motor subtype (50.3% [95% CI 46.0–54.7]), followed by mixed delirium (27.7% [95% CI 24.1–31.3]) and hyperactive delirium (22.7% [95% CI 19.0–26.5]). When comparing the delirium motor subtypes, patients with mixed delirium experienced the longest delirium duration, ICU and hospital length of stay, the highest ICU and hospital mortality, and more frequently received administration of specific agents (antipsychotics, α2-agonists, benzodiazepines, and propofol) during ICU stay. In studies with high average age for delirious patients (>65 years), patients were more likely to experience hypoactive delirium.

Conclusions: Hypoactive delirium was the most prevalent motor subtype in critically ill patients. Mixed delirium had the worst outcomes in terms of delirium duration, length of stay, and mortality, and received more pharmacological interventions compared to other delirium motor subtypes. Few studies contributed to secondary outcomes, hence, these results should be interpreted with care. The large between-study heterogeneity suggests that a more standardized methodology in delirium research is warranted.

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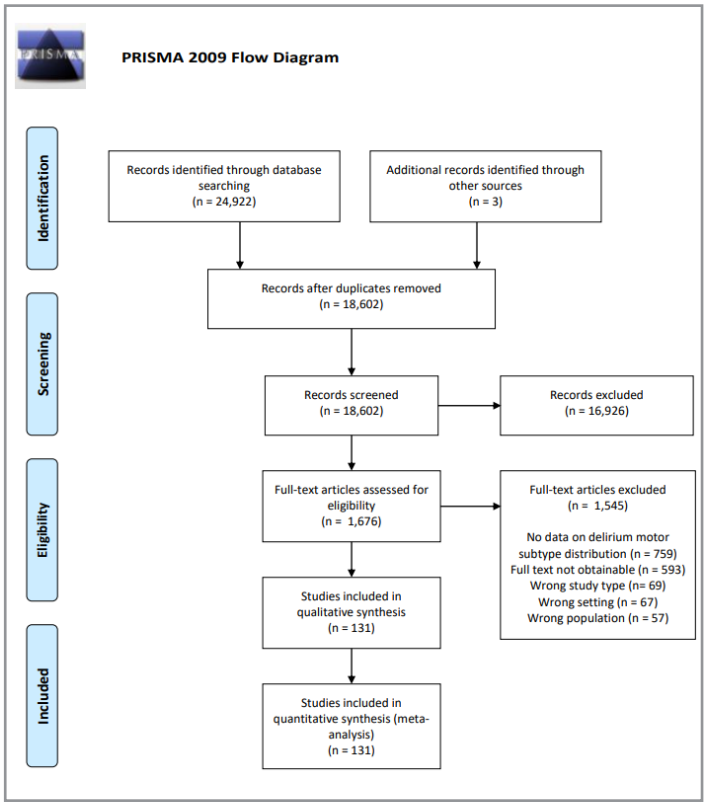
https://ccforum.biomedcentral.com/articles/10.1186/s13054-022-03931-3

Distribution of delirium motor subtypes				
Delirium Motor Subtype	**Studies reporting on outcome (n)**	**Delirious patients in studies reporting on outcome (n)**	**Pooled proportion (%)**	**95% CI**
Studies reporting 3 motoric subtypes				
Hypoactive*	111	11,663	50.3	46.0 – 54.7
Hyperactive**	109	11,626	22.7	19.0 – 26.5
Mixed	108	11,509	27.7	24.1 – 31.3
Studies reporting 2 motoric subtypes***				
Hypoactive	19	2434	61.4	49.2 – 73.5
Hyperactive	19	2434	38.6	26.5 – 50.8

*Three studies only had data on distribution of the hypoactive delirium motor subtype
**One study only had data on distribution of the hyperactive delirium motor subtype
***These studies only discriminated between hypoactive and hyperactive delirium motor subtype

PO 18 *Table 1.*



PO 18 *Figure 1.*

PO 19 – ID 417

DEMOGRAPHIC AND CLINICAL PROFILE OF A COHORT OF CRITICALLY ILL SARS-COV-2 PATIENTS WITH AND WITHOUT DELIRIUM

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Background/Aims: SARS-CoV-2 emerged as a global pandemic and Delirium has been described as a neurological manifestation of it. This study compares demographic and clinical features of critically ill SARS-CoV-2 patients with (w/D) and without Delirium (w/oD).

Materials and Methods: A retrospective cohort study of 942 consecutive SARS-CoV-2 patients admitted in a Portuguese intensive care unit (ICU), between 03/2020-05/2022, was conducted. Demographic, clinical and ICU data were extracted, namely: gender, nationality, age, comorbidities, mechanical ventilation (MV) and its duration, ECMO support, sedation, ICU length of stay and hospital mortality. Delirium diagnosis was made according to The Confusion Assessment Method for ICU. Statistical analyses were performed using SPSS (v.26) with a significance level of $p<.05$. Variables collected were compared between patient's w/D and W/oD using T-test or Mann-Whitney U test for continuous variables and Chi-square test or Fisher's exact test for categorical variables.

Results: Delirium's prevalence was higher during the third Portuguese wave (40.1%) and lower in the fifth (0.7%). Altogether, the prevalence was 15.1%. Statistical differences were found between patients w/D and w/oD, explicitly in: male gender (w/D:81.0%, w/oD:67.4%), Asian nationality (w/D:26.5%, w/oD:12.5%), MV support (w/D:91.5%, w/oD:64.6%), duration of MV (w/D: average of 17 days, w/oD: average of 10 days), ECMO support (w/D:20.4%, w/oD:6.9%), need of sedation (w/D:86.7%, w/oD:58.5%) and hospital mortality (w/D:20.4%, w/oD:37.6%). There was no association between Delirium and age (> 65 years – w/D:36.6%, w/oD:44.8%, mean age – w/D:59 years, w/oD:60 years), comorbidities (w/D:81.7%, w/oD:84.1%) or longer ICU stay (w/D and w/oD: average of 11 days).

Conclusions: Delirium was associated with ICU admission during the third Portuguese wave, male gender, Asian nationality, MV support, increased duration of MV, ECMO support and need of sedation.Compared to other studies, our cohort showed a lower prevalence of delirium and no association with age, comorbidities, hospital mortality or longer ICU stay.

PO 20 – ID 420

DELIRIUM IDENTIFIED THROUGH CLINICAL RECORDS AND ITS CORRELATION TO COVID-19 IN NURSING HOME RESIDENTS

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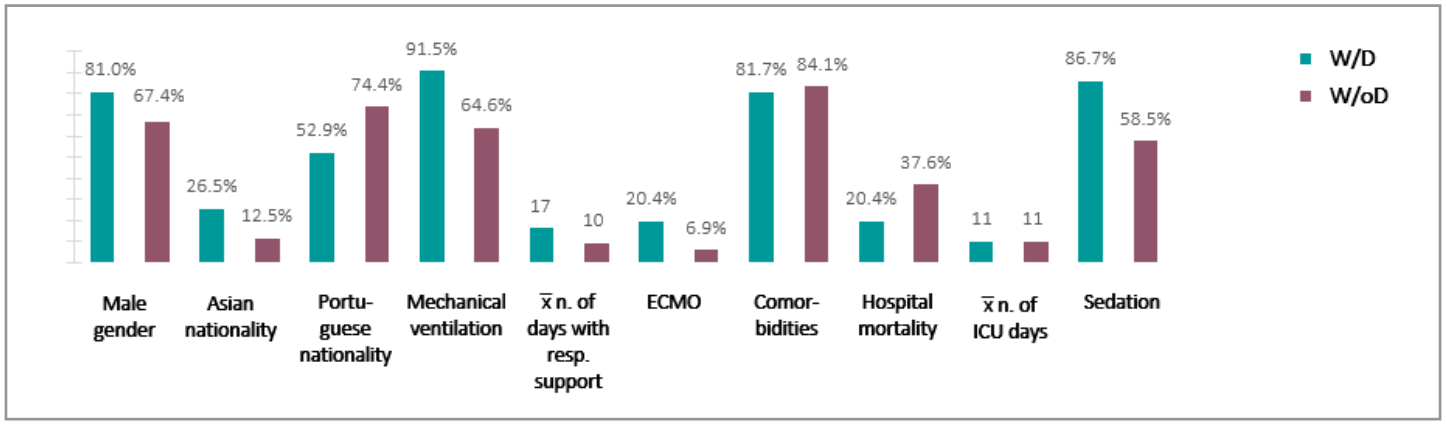
Background: Delirium in nursing homes (NH) is often undiagnosed, though it is known to be highly prevalent and relevant condition, as can be inferred from medical charts. We also know delirium is more common in patients with COVID-19, as a result of pathological changes in the body and to the environmental restrictions put in place to fight COVID-19. Aims: To analyse the incidence of delirium in a sample of patients admitted to a skilled NH during the first months of the pandemic.

Methods: retrospective analysis of medical charts of a group of NH patients admitted from March to July 2020 (when severe restrictions in NH were in place because of



PO 19 Figure 1. Demographic and clinical data of patient's w/D and W/oD.

the pandemic). Delirium episodes, according to DSM-5 criteria, were identified by two independent researchers and a delirium expert providing a definitive diagnosis. We analysed the relation of delirium with demographical and clinical variables (including medication, infection and symptoms of COVID-19 and previous dementia) known to have a relationship with delirium, as well as the patient's prognosis after 6 months (death, urgent transfer to general hospital, NH, long-term care facility, home).

Results: 23.9% of patients had a possible delirium episode, and the most common probable trigger was a urinary tract infection. Agreement between the first two researchers was minimal (κ = 0.36) and was only somewhat better with the expert evaluator (0.46 and 0.52). Delirium was not associated with any demographic or clinical variables or with the patient's prognosis 6 months after.

Conclusions: Delirium diagnosis through searching in medical records shows a low agreement between researchers and probably has a high risk of bias. Further research is needed to understand how the causes and prognosis of delirium patients in the circumstances of the early phase of the pandemic differ from delirium patients in other settings.

PO 21 – ID 325

EXPLORING MULTIDISCIPLINARY DELIRIUM CARE FOR HOSPICE IN-PATIENTS: A QUALITATIVE INTERVIEW STUDY WITH STAFF AND VOLUNTEERS

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Background/Aims: Delirium is common in hospice in-patients, with a median prevalence of 60% during in-patient palliative care admissions.1It is distressing for patients, their families and clinicians. A better understanding of current multidisciplinary care of delirium is needed in order to develop effective interventions in this setting. We aimed to explore:

1. Hospice staff and volunteers' practices in delirium prevention, recognition, assessment and management.
2. The influences upon that practice.
3. Practice strengths, and what may need to change, to inform the development of tailored interventions to improve delirium care in hospices.

Materials and Methods: We conducted a qualitative interview study at two UK in-patient hospices. Thirty-three staff and volunteers were recruited, purposively sampled to include different professional groups and roles. We used behaviour change theory to support analysis of the influences on participants' delirium care behaviours.

Results: We found that participants' practice focus was on managing hyperactive symptoms of delirium. Delirium prevention, early recognition and hypoactive delirium received much less attention. Staff and volunteers' emotional responses to the distress of patients with hyperactive symptoms, and that of their families and others in the hospice, strongly influenced this focus. This emotional response, as well as time and staffing pressures, influenced the use of medication to control hyperactive delirium symptoms. Understanding of delirium prevention, recognition and care was limited and varied between staff groups. Enablers for the use of non-pharmacological strategies for delirium included the culture of person-centred and family-centred care, supportive team working and adequate staffing levels.

Conclusions: A shared hospice team understanding of delirium is required, especially of the potential for delirium prevention, early recognition and non-pharmacological strategies to reduce patient distress. These findings can inform a tailored approach to developing clinical practice and new interventions to improve care and reduce the distress that delirium causes in hospice settings.

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PO 22- ID 353

UNPACKING THE ENVELOPE: AMPLITUDE-COUPLING STRENGTH AND NETWORK TOPOLOGY IN DELIRIUM

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Background/Aims: Delirium has been linked to decreased global functional connectivity and less efficient communication of brain networks. However, studies up

until now used phase-based connectivity measures, while the role of amplitude-coupling in functional networks of delirium has never been studied. It is assumed that amplitude plays a role in the disintegration of networks that underlies delirium. We aimed to assess amplitude-coupling strength and its functional network topology in patients with or without delirium.

Methods: Electroencephalography registrations were performed in age and gender-matched postoperative patients with (*n* = 18) or without hypoactive delirium (*n* = 20). Global functional connectivity was measured with an amplitude envelope-based measure: the corrected amplitude envelope correlation. Network topology was assessed using the minimum spanning tree, an assessment of the backbone of the brain network.

Results: Patients with delirium (median, 0.363, interquartile range, 0.340-0.386) showed a less integrated network structure in the alpha frequency band compared to controls (median, 0.393, interquartile range, 0.356-0.416, $p = 0.044$). No significant differences in amplitude-coupling strength were found between delirious and non-delirious patients.

Conclusions: Although global amplitude-coupling strength was not altered, alpha amplitude-coupling followed a less integrated network structure in hypoactive delirium patients compared to controls. This may explain characteristic symptoms of delirium, such as altered levels of consciousness and attention deficits.

Patient characteristics	All patients N = 950	Propofol only N= 366	Midazolam only N = 207	Propofol and midazolam N = 377
Age in years, mean (SD)	58 (16)	59 (15)	62 (14)	54 (16)
Male sex, n (%)	635 (67%)	229 (63%)	133 (64%)	273 (72%)
BMI, mean (SD)	26 (5.6)	26 (5.8)	26 (5.8)	26 (5.0)
Body weight in kg, mean (SD)	80 (19)	79 (19)	78 (17)	82 (18)
Type of admission:				
Medical, n (%)	379 (40%)	111 (30%)	99 (48%)	169 (45%)
Emergency surgery, n (%)	308 (33%)	151 (41%)	42 (20%)	115 (31%)
Elective surgery, n (%)	262 (28%)	103 (28%)	66 (32%)	93 (25%)
APACHE-IV score [a], mean (SD)	70 (28)	64 (24)	84 (29)	69 (28)
Charlson Comorbidity Index [b], median (IQR)	1 (0 - 2)	1 (0 - 2)	2 (0 - 2)	0 (0 - 2)
Delirium before unarousable state, n (%)	66 (7.1%)	14 (4%)	33 (16%)	19 (5%)
Maximum mSOFA score [c], median (IQR)	8 (6 – 9)	8 (6 – 10)	9 (7 – 12)	8 (6 – 11)
SOFA circulation [c], median (IQR)	4 (3 – 4)	4 (3 – 4)	4 (3 – 4)	4 (3 – 4)
SOFA respiration [c], median (IQR)	3 (2 – 3)	2 |(2 – 3)	3 (2 – 3)	3 (2 – 3)
Mechanical ventilation [c], n (%)	775 (82%)	249 (68%)	182 (88%)	344 (91%)
Metabolic acidosis [c], n (%)	671 (71%)	245 (67%)	147 (71%)	281 (75%)
Acute kidney injury [c], n (%)	96 (10%)	19 (5%)	38 (18%)	39 (10%)
Other medication [c]				
Opioids, n (%):	813 (86%)	303 (83%)	165 (80%)	345 (92%)
Corticosteroids, n (%):	377 (40%)	118 (32%)	104 (50%)	155 (41%)
Clonidine, n (%):	190 (20%)	56 (15%)	28 (14%)	106 (28%)
Haloperidol, n (%):	48 (5.1%)	7 (7%)	21 (10%)	20 (5%)
Non-midazolam benzodiazepines, n (%):	22 (2.3%)	7 (2%)	3 (1%)	12 (3%)
Length of ICU stay in days, median (IQR)	7 (3 - 13)	5 (3 - 9)	9 (5 – 18)	9 (5 - 15)
ICU mortality, n (%)	26 (2.7%)	3 (1%)	12 (6%)	11 (3%)
Hospital mortality, n (%)	120 (13%)	31 (9%)	46 (22%)	43 (11%)
Cum. propofol IV dose in mg, median (IQR)	N/A	3727 (1781 – 6930)	N/A	4862 (1767 – 12233)
Cum. midazolam IV dose in mg, median (IQR)	N/A	N/A	171 (67 – 398)	115 (23 – 370)
Length of firs sedation episode in days, median (IQR)	2 (1 – 3)	1 (1 – 2)	2 (1 – 4)	2 (1 – 3)
Cumulative SBI, median (IQR)	1.4 (0.8 – 2.7)	0.9 (0.8 – 1.7)	1.3 (0.7 – 2.3)	2.4 (1.2 – 4.2)

SD = standard deviation, BMI = Body Mass Index, APACHE = Acute Physiology and Chronic Health Evaluation, IQR = interquartile range, mSOFA = modified Sequential Organ Failure Assessment score, ICU = Intensive Care Unit

[a] Not available in 105 patients, mean reported for 845 patients. Missing APACHE IV was associated with admission type (more acute surgery), longer ICU length of stay, and type of sedation (less often midazolam sedation), but was not associated with delirium.

[b] Not available in 190 patients, median reported for 760 patients. Missing CCI was associated with shorter ICU length of stay, type of sedation (more often propofol sedation/less often midazolam sedation), and less delirium.

[c] During the days that patients were in an unarousable state due to sedation.

***PO 23** Table 1. Patient characteristics*

PO 23 – ID 355

THE RISK OF DELIRIUM AFTER AN UNAROUSABLE STATE DUE TO SEDATION WITH PROPOFOL OR MIDAZOLAM IN INTENSIVE CARE UNIT PATIENTS

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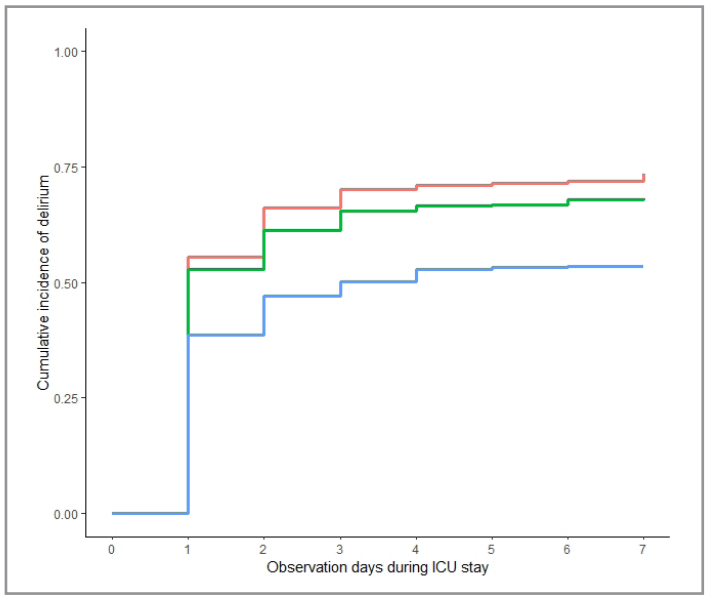
Background/Aims: Knowledge on risk factors may provide strategies to reduce the high burden of delirium in Intensive Care Unit (ICU) patients. The quality of evidence regarding the association between type of sedation and the risk of subsequent delirium is low. We aimed to compare the risk of delirium after continuous sedation with propofol versus midazolam in ICU patients.

Materials and Methods: This retrospective cohort study using prospectively collected data was conducted in a mixed medical-surgical-cardio-neuro ICU at the University Medical Center in Utrecht, the Netherlands. We included all ICU patients who were admitted between 2011-2013 and 2015-2019 for ≥24 hours and who were in an unarousable state (defined as a Richmond Agitation-Sedation Scale score of < -3) for ≥24 hours due to continuous sedation with propofol and/or midazolam. Patients admitted ≤24 hrs., those with an acute neurological disorder and patients receiving palliative sedation were excluded. ICU patients were systematically assessed for delirium during the seven days following an unarousable state using a validated 5-step algorithm. Fine and Gray regression analyses were conducted to study associations between propofol and midazolam exposure and subsequent delirium risk.

Results: Among 950 included patients, 605 (64%) subjects were delirious during the seven days after awaking. The proportion of subsequent delirium was higher after midazolam sedation (152/207 (73%) patients) and after both propofol and midazolam sedation (257/377 (68%)



***PO 23** Figure 1.*

patients), compared to propofol sedation alone (196/366 (54%) patients). Midazolam sedation (adjusted Hazard Ratio (aHR) 1.25, 95% Confidence Interval (CI) 1.05 – 1.49) and propofol and midazolam sedation (HR 1.30, 95% CI 1.12 – 1.51) were associated with a higher risk of subsequent delirium, compared to propofol sedation alone.

Conclusions: Continuous sedation with midazolam is associated with an increased risk of subsequent delirium compared to propofol. Our findings suggest using propofol over midazolam for sedation in ICU patients.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

PO 24 – ID 367

ASSESSING RECOVERY FROM DELIRIUM IN OLDER HOSPITALISED PATIENTS: EVALUATION OF INDIVIDUAL SYMPTOM DOMAINS

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Background: Determining if a patient's delirious episode has resolved is essential for clinicians to evaluate the effects of treatment, manage risk of complications and inform discharge planning. Yet few studies have investigated how individual symptom domains of delirium change over the course of a patient's hospital stay. This study tracked recovery in specific domains of delirium by conducting multiple repeated assessments.

Materials and Methods: Acute older hospitalised inpatients (≥70 years) with confirmed delirium were assessed on 2-4 occasions over ≤9 days. Assessments comprised tests of individual symptom domains of delirium (arousal, attention, memory, orientation, psychotic symptoms, distress, language) and included the DelApp attention test, Richmond Agitation Sedation Scale (RASS), 3-item recall (memory), etc., and the 4AT.

Results: 111 participants (median age 87, range 70-99, 61 (55%) female, 51 (46%) with dementia) were included. Overall, there was recovery from delirium as assessed by the 4AT ($t(110)=6.34$, $p < .001$), though there was considerable variability within the sample. Arousal impairment improved over time ($t(110)=3.51$, $p < .001$), as did impairments in orientation ($t(110)=2.39$, $p < .05$), attention ($t(110)=2.35$, $p < .05$), short-term memory ($t(83)=2.22$, $p < .05$) and long-term memory ($t(83)=7.15$, $p < .001$). There was also a reduction in reported psychotic symptoms (hallucinations and delusions) from first to last assessment ($t(110)=5.86$, $p < .001$). No change was observed between first and last assessments for level of distress nor language.

Conclusions: Most individual symptom domains of delirium improved over time, in line with overall recovery. Delirium recovery assessment should involve tracking of different symptom domains, including distress and psychotic features.

PO 25 - ID 382

USING REALIST PROGRAMME THEORY TO DESIGN A NEW INTERVENTION FOR IMPROVING RECOVERY AFTER DELIRIUM

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Background/Aims: People who recover poorly after delirium are likely to require an increased level of care. It is presently unknown whether interventions to improve recovery after delirium are effective and cost-effective. This research aimed to develop a programme theory to inform the design of an intervention to improve recovery after delirium.

Methods: A rapid realist review of literature was conducted to develop an initial programme theory. Following this, a qualitative investigation of the perceived rehabilitation needs of older people who have experienced delirium during a hospital stay was conducted via semi-structured interviews with 41 key stakeholders (older people (5), carers (12), and healthcare professionals (24)). Data were analysed using a realist approach to identify what works, for whom, and in what context. This was deductively informed by the initial programme theory while also employing an inductive analysis to identify novel insights. Through an iterative, retroductive process, context-mechanism-outcome configurations (CMOCs) were coded to reflect stakeholders' views to refine the programme theory.

Results: The initial programme theory highlighted the importance of cognitive and physical rehabilitation and emotional support as key domains of recovery. New CMOCs included optimisation of good medical care to manage delirium, and monitoring and management of underlying medical conditions to promote recovery. Others included developing educational resources and support networks for older people and their carers to aid sense-making, and encouraging social interaction to reduce isolation and empower independent functioning. These recovery elements should be addressed in a person-centred manner that is tailored to individual needs and preferences, engages carers, integrates intervention goals into daily functioning, and ensures continuity of care.

Conclusions: A refined programme theory was developed and is currently being used to design a manualised intervention to improve recovery after delirium. The acceptability of the intervention will be tested in a multi-centre, single-arm feasibility study.

PO 26 – ID 389

MANAGEMENT OF DELIRIUM WITHIN INTRAOPERATIVE SETTINGS FOR OLDER ADULTS WITH HIP FRACTURE: A SCOPING REVIEW

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Background/Aims: Delirium is a common adverse event in older patients undergoing hip fracture repair surgery. The impact of hospital-acquired delirium during intraoperative phase of their treatment can have a significant impact on post-operative outcomes. While non-pharmacological, multicomponent delirium prevention interventions are considered standard practice in acute medical units, delirium management in the intraoperative setting is less clear. The review aim was to identify evidence-based delirium management interventions which are, and could be, undertaken within the intraoperative setting for older patients undergoing hip fracture repair surgery.

Materials and Methods: The methodological framework developed in the seminal work by Arksey and O'Malley (2005) was used for this scoping review. Seven databases including Cochrane, CINAHL, Embase, MEDLINE, PsychINFO, PubMed and SCOPUS were systematically searched. The search was limited to the last 11 years (2009–2020). Research studies included both primary and secondary sources of evidence.

Results: A total of 2464 articles were initially identified. These articles were further refined using keyword searches and exclusion criteria, with a final set of 16 articles meeting the inclusion criteria. Three main themes were as follows: anaesthetic-related interventions used to prevent delirium, recognising non-modifiable and potentially modifiable risk factors, and screening and diagnosis of delirium.

Conclusions: While there is a strong focus on anaesthetist-led interventions in the intraoperative setting, there are opportunities for more nurse-led interventions through adequate pain management and haemodynamic monitoring that require further research. Identifying the best test for screening and diagnosing delirium in the intraoperative setting requires further research.

PO 27 - ID 410

PREHABILITATIVE SLEEP PROMOTION TO PREVENT POSTOPERATIVE DELIRIUM – CONCEPTION AND FIRST RESULTS OF A PILOT STUDY

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Background/Aims: Sleep disorders are a risk factor to develop delirium after surgery. Therefore, prehabilitative sleep promotion is a promising approach to prevent postoperative delirium. The aim of our pilot study is to develop, implement and evaluate an individualized sleep intervention for older people (>65 years) with insomnia facing surgery.

Materials and Methods: Based on the findings of a previous systematic review, we chose the Brief Behavioral Treatment for Insomnia (BBTI), which incorporates elements of the Cognitive Behavioral Therapy for Insomnia (CBT-I). We would like to test its effectiveness with about 20 patients. The ongoing trial is conducted in a pre-post design without control group. Outcomes include Pittsburgh Sleep Quality Index, Insomnia Severity Index, Epworth Sleepiness Scale, 4-AT (delirium assessment) and a sleep diary. To capture the patients' perspective on the intervention, guide-based interviews are conducted after the intervention.

Preliminary Results: Sleep quality: PSQI and ISI improved by 4/3 points. Sleepiness increased by 4 points, which indicates a successful sleep restriction. So far, no delirium symptoms after surgery occurred. All but one participant rated the treatment as effective, acceptable and feasible. Adverse effects were tiredness, headaches, freezing and increased appetite for the first week. The interviews showed that it was helpful for the participants to get information about sleep, to reflect on their own (sleeping) habits and to discuss how to optimise them.

Preliminary Conclusions: The first results indicate that prehabilitative sleep promotion could become feasible and acceptable as a promising approach to prevent postoperative delirium. However, implementation and recruitment are challenging. More participants are needed to draw first conclusions.

PO 28 – ID 307

AN INITIATIVE TO INCREASE THE AWARENESS AND KNOWLEDGE ON DELIRIUM IN THE BRAIN AWARENESS WEEK 2022 WITH THE WORLD DELIRIUM AWARENESS DAY

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Introduction: Delirium is a frequent geriatric syndrome widely studied in acute hospital settings. Little information is available on delirium prevalence in intermediate care and Nursing Home (NH). As of today, the prevalence of delirium in NH ranges from 36% to 70% and from 14% and 18% in rehabilitation. Several initiatives have been conducted worldwide during the 5th World Delirium Awareness Day (www.idelirium.org). The goal of this study was to retrospectively evaluate the prevalence of delirium and its related factors in the Intermediate Care and NH of the Azienda Speciale di Cremona Solidale (A.S.C.S.).

Materials and Methods: The A.S.C.S. is the largest public institution in Cremona (Italy) including 79 beds of Intermediate Care and 360 beds of NH, along with four daily care center, and home care. During the Brain Awareness week, we conducted several initiatives including an introduction of the epidemiology, outcomes, prevention and treatment of delirium. Additionally, in three index day (16/3/2022 to 18/3/2022) in a clinical audit we evaluated the presence of delirium with the 4AT and its related factors in a convenient sample of persons 65 years of age and older in the Intermediate Care Unit N=61) and in the NH (N=101). Given the sample size, a univariate analysis was carried out to evaluate the association between delirium and the clinical variables.

Results: The point prevalence of delirium in the Intermediate Care was 3% (N=2), with a 44% (N=44) prevalence in NH. We report the univariate analysis results from the NH setting, given the high delirium prevalence. There was a significant association between delirium and more severe cognitive (MMSE 3.4 + 4.8 vs. 17.2 + 7.5 DS) and functional impairment (Barthel index 7.8 + 8.5 vs. 25.1 + 25.2), evaluated before the index day. Additionally, persons with delirium had a higher dependency in dressing, eating, toileting, walking and transfer on the index day. Physical restraint was present in 85% of people and in 82% of cases the side rails were used for safety or fall prevention purposes. In patients with delirium there was a significant association with the use of the pelvic girdle (65% vs. 35%) and the body-vest (18% vs. 1%). There was also an association between the reason for the restraints use and delirium including fall prevention (52% vs. 48%) and control of agitation (77% vs. 23%).

Conclusions: The data from this study underlines the

necessity and the importance to further study and implement the use of instruments for delirium evaluation in understudied setting, given the findings of a small prevalence of delirium in intermediate care, compared to previous studies. The data confirm the relevance of delirium screening in frail persons - those with more severe cognitive and functional impairment- in NH and the necessity to evaluate more in depth, with prospective cohort studies, the directionality of the association between the use of restraints and delirium.

PO 29 – ID 309

IDENTIFYING NEUROCOGNITIVE OUTCOMES AND CEREBRAL OXYGENATION IN CRITICALLY ILL ADULTS ON ACUTE KIDNEY REPLACEMENT THERAPY IN THE INTENSIVE CARE UNIT: THE INCOGNITO-AKI FEASIBILITY STUDY

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Background/Aims: The burden of dialysis-requiring acute kidney injury (AKI) is rising among critically ill adults[1,2]. Long-term kidney replacement therapy (KRT) and critical illness have been independently linked to acute (e.g., delirium) and prolonged cognitive impairment[3], and structural brain pathology[4]. The cause is not known, but may be related to poor regional cerebral oxygenation (rSO2)[5,6]. We assessed the feasibility of a longitudinal study exploring the association between intradialytic rSO2 and delirium, and evaluating the long-term consequences of intradialytic rSO2.

Materials and Methods: We enrolled patients initiated on KRT in the Kingston Health Sciences Centre intensive care unit (ICU, Kingston, Canada). Participants underwent continuous rSO2 monitoring for 72h of continuous KRT (CKRT), and continuously during intermittent hemodialysis (iHD). Daily delirium screening was performed using the Confusion Assessment Method (CAM-ICU-7). Cognitive and neurological outcomes were assessed at 3- and 12-months using the Kinarm Standard Tests™ and Repeatable Battery for the Assessment of Neuropsychological Status.

Results: Of 484 ICU patients, 26 were assessed for eligibility. Two declined, and 13 met at least one exclusion criteria. Eleven patients (mean age 67.45 [12.72] years, 63.64% male) were enrolled. Participants spent mean 7.48 [9.25] days on CKRT, and 1.75 [2.966] days on iHD. Seven participants subsequently died in ICU, one died two months after discharge, and one declined follow-up. Data capture rates were high: rSO2/vitals (91.3%), delirium screening (100%), demographics (100%), follow-up testing (100%). Figure 1 illustrates the feasibility of collection of continuous vitals and rSO2 for the first enrolled participant.

Conclusions: It is feasible to collect rSO2 and delirium data in critically ill patients undergoing KRT. Long-term follow-up will be challenging in this cohort due to high mortality. This project will ultimately provide insight into the early neurological changes occurring in patients initiated on KRT in the ICU, and their impact on cognition and brain pathology.

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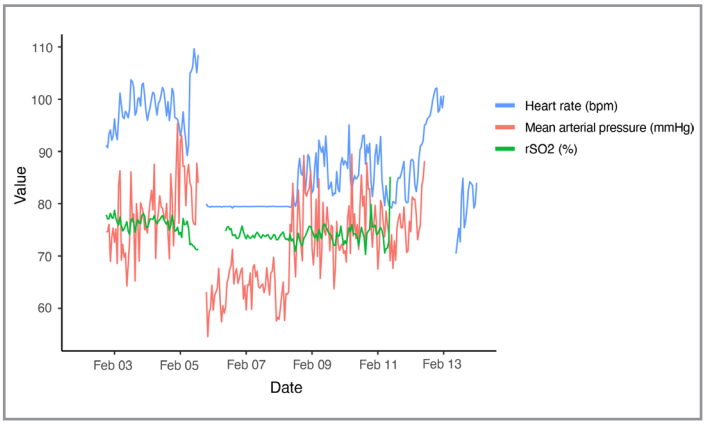

***PO 29** Figure 1.*

PO 30 – ID 314

PROGNOSTICATION AT THE BEDSIDE TO FACILITATE CLINICAL DECISION-MAKING IN OLDER PATIENTS WHO HAVE DELIRIUM: A LITERATURE REVIEW

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Background/Aims: Patients with delirium are known to have a high mortality. However, clinicians continue to struggle with prognostication at the bedside. At this time there remains no comprehensive literature to guide clinical decision making based on individual patient characteristics. In order to inform decision making, we reviewed the literature to list variables associated with mortality in older patients with delirium.

Methods: A literature search was performed for variables associated with mortality in patients with delirium. The electronic databases Google Scholar, Ovid MEDLINE, and PubMed were searched. Articles were included if they were original research, and there was a diagnosis of delirium. We excluded papers with diagnoses of delirium tremens, covid infection, or subsyndromal delirium.

Results: 12 studies with 241,673 participants were included in our final review. Mean age ranged from 62 years to 88.4 years, 21% to 61% of study participants were male, and delirium rate was 15% to 100%. Overall mortality was reported by 7 studies and ranged from 8.3% to 56%. The settings included palliative care, intensive care, hospital inpatient, and long-term care in 5 countries. The most commonly reported variables associated with higher mortality in patients who had delirium included: comorbid diseases (3 studies) followed by increasing age, and cognitive impairment (2 studies). The following variables were each reported in one study only: male sex, polypharmacy, white race, daily living problems, demand ischemia, persistent delirium, restraining devices, urinary catheters, falls, pressure ulcers, sleep deprivation, acute malnutrition, low BMI, delayed initiation of therapy, severe or hyperactive type of delirium and aspiration pneumonia. In a systematic review, two symptoms of delirium, inattention and altered level of arousal, were associated with higher mortality.

Conclusion: This literature review provides clinicians with information to aid in prognostication at bedside for older patients who have delirium.

Author, year	Variables associated with mortality in patients with delirium	OR (95% CI)	p value
Marcantonio, 2002	Hyperactive delirium vs hypoactive delirium (79% vs. 32%) [Associated with 30-day mortality after adjusting for severity of delirium] Severe delirium vs mild delirium (52% vs 17%) [Associated with 6-month mortality]	Adjusted OR 2.4, 95% (CI 1.4 - 4.2) RR 3.1, 95% (CI 1.2 - 8.2)	0.003 < 0.01
Leonard, 2008	Age Greater severity of cognitive impairment Organ failure [All associated with survival in terminally ill patients]	NR NR NR	0.01 < 0.001 0.01
Agar, 2016	Lower BMI [Associated with higher mortality in non-cancer patients]	OR (multivariable analysis) 0.67 (0.46 - 0.97)	
Ward, 2015	Increasing age, white race, physical illness, daily living problems, depression, low MMSE score	NR	NR
Teiges, 2021	Inattention Altered level of arousal	(OR 2.57, 95%CI 1.73 to 3.8) (OR 2.8l 95% CI 2.33-3.37)	
Kumar, 2022	Demand ischemia vs no demand ischemia (28% vs. 12%) [No significant association when adjusted for demographics and clinical data]	NR	< 0.001
Shinozaki, 2019	Higher BSEEG score [Associated with 360-day mortality, controlled for age, sex, and CCI score]	HR 1.44, 95% (CI 1.12 - 1.84)	0.004
Kiely, 2008	Persistent delirium vs. Non-persistent delirium [Associated with 1-year mortality, adjusted for age, sex, comorbidities, functional status, and dementia]	HR 2.9, 95% (CI = 1.5 - 4.4)	NR
Dharmarajan, 2016	Restraining devices, urinary catheters, falls, pressure ulcers, sleep deprivation, acute malnutrition, dehydration, and aspiration pneumonia [Associated with 90-day mortality in patients with incident delirium]	NR	NR
Pisani, 2009	Increased days of ICU delirium [Associated with 1-year mortality]	HR 1.10, 95% (CI 1.02–1.18)	0.01
Özdin, 2021	Male gender High number of comorbid conditions High number of daily medications [All associated with higher in-hospital mortality]	(OR 2.86, 95% CI 1.03 7.93) (OR 1.96, 95% CI 1.4-2.73) (OR 1.45, 95% CI 1.26-1.67)	
Heymann, 2010	Delayed initiation of therapy (>24 hours) vs immediate initiation of therapy (< 24 hours) (35% vs. 8.7%)	NR	0.003
MMSE: mini mental state exam, OR: odds ratio, CI: confidence interval, HR: hazard ratio, BSEEG: Bispectral electroencephalography, NR: not reported.			

***PO 30** Table 1. Variables Associated with Mortality in Older Patients with Delirium.*

PO 31 – ID 318

HOSPITAL LENGTH OF STAY AND READMISSIONS ASSOCIATED WITH DELIRIUM AMONG LIVER TRANSPLANT RECIPIENTS

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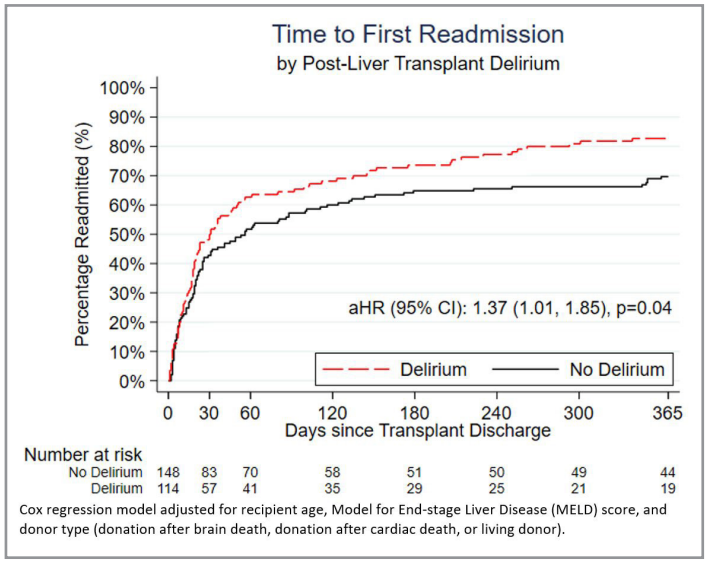
Background: Delirium impacts hospital and post-discharge courses of older adults, but less data exists for liver transplant recipients (LTRs) despite their high risk of delirium.

Methods: Using LTRs in a prospective cohort study at Johns Hopkins Hospital, we abstracted CAM-ICU delirium assessments and hospital admission and readmission data from the medical record. We compared outcomes

of patients by presence of post-transplant delirium using descriptive statistics (Chi-squared and rank-sum testing) and multivariable Cox regression.

Results: Of 262 LTRs, 43.5% experienced delirium, with a median (IQR) duration of 2 (1-4) days. Delirium was associated with longer post-transplant length of stay [median (IQR) 18 (10-39) vs. 9 (7-15) days, p<0.001)]. Delirium was associated with lower likelihood of discharge home (38.6% vs. 55.4%) or home with nursing services (25.4% vs. 35.8%) and higher likelihood of discharge to rehabilitation facility (32.5% vs. 6.8%, p<0.001). However, delirium was not associated with 30-day readmission (60.5% vs. 61.4%, p=0.9), total readmissions in the 12 months post-transplant [median (IQR) 2 (1-4) vs. 2 (1-4), p=0.7], or total days hospitalized in the 12 months post-transplant [median (IQR) 12 (6-31) vs. 11 (3-24), p=0.1]. However, on Cox regression, risk of first readmission was 37% higher for patients with delirium (aHR 1.37, 95% CI 1.01-1.85, p=0.04). The percentage of readmissions related to the transplant was similar for LTRs with and without delirium (48.0% vs. 49.1%, p=0.9). The most common reasons for first post-transplant readmission for patients with vs. without delirium were similar (p=0.5): graft issues (40.7% vs. 29.7%), infection (8.8% vs. 17.8%), and electrolyte abnormalities (6.6% vs. 9.9%).

Conclusions: Post-transplant delirium is common and associated with longer transplant hospitalization length of stay and discharge to a rehabilitation facility. Delirium was not associated with 30-day readmission but was associated with higher risk of overall readmission in the first 12 months post-transplant.



***PO 31** Figure 1.*

PO 32 – ID 322

INCIDENCE OF POST-OPERATIVE DELIRIUM IN ELDERLY PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY

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Background/Aims: Post-operative delirium (POD) is one of the most insidious complication in elderly and is associated with prolonged mechanical ventilation, increase length of stay (LOS) in hospital, neurocognitive impairment and an overall increase mortality. In literature, the incidence of post-operative delirium (POD) after major abdominal surgery is 25%. The aim of the study is to assess the incidence of POD in elderly patients undergoing major abdominal surgery, adverse events and risk factors for POD have also been recorded.

Methods: We conducted an observational, prospective, monocentric study. We enrolled patients aged ≥60 yrs., scheduled for major abdominal elective surgery from august 2019 to October 2019 at department of Oncological Anaesthesia and Intensive Care of Careggi University Hospital. Five days, 1 – 3 months follow-up were recorded. Confusion Assessment Method (CAM) and the CAM-ICU were used as diagnostic tools for POD assessment.

Results: From the 110 patients enrolled, 11 developed POD with an incidence of 10% (C.I 5,1 – 17,2). No difference between the delirium post-operative Group (PODg) and not-POD group (nPODg) was found in the pre-operative data, except for an older age and a higher value of Charlson Comorbidity Index in PODg. PODg experienced higher incidence of intraoperative burst suppression (60% vs 24%, p<0.05) and prolonged amount of intraoperative hypotension (23,7 min vs 6,3 min, p<0,05). PODg experienced more morphine prescription and longer mobilization times, LOS in ICU and higher incidence of post-operative complications (63% vs 17%, p <0.05). PODg showed a worsening of the Short Blessed Test performance at follow-up.

Conclusions: We founded a lower incidence of POD but it still remain a serious complication associated with morbidity and poor neurocognitive performance still after discharge, with worsening of patient's quality of life. A multidisciplinary strategy is due to reduce the iatrogenic risk factors that can precipitate the fragile patient's compensation.

PO 33 – ID 329

POSTOPERATIVE DELIRIUM IS AN UNDERDIAGNOSED COMPLICATION AND IS AN INDEPENDENT RISK FACTOR INFLUENCING A PROLONGED LENGTH OF STAY IN INTENSIVE CARE UNIT AND IN HOSPITAL

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Background/Aims: Postoperative delirium (POD) is an adverse and underdiagnosed postoperative complication of elderly patients [1–3]. The aim of our different subgroup analyses was to figure out if POD is an independent risk factor for a prolonged stay in ICU and in hospital. Furthermore, the frequency of positively tested delirium was compared with the frequency of ICD diagnoses (International Statistical Classification of Diseases and Related Health Problems) in the group of cardiac patients.

Materials and Methods: The entire study, conducted from 2018 to 2019 under the title "PRe-Operative Prediction of postoperative Delirium by appropriate SCreening (PROPDESC)", included 1097 patients aged 60 years or older and with a planned surgery duration of at least 60 minutes [4]. Using the data set of this prospective observational study of patients from different surgical departments, patients aged 70 years and older [5] and furthermore cardiac surgery patients [6] were studied in more detail. POD was considered positive if one of the following tests were positive on any of the five postoperative visit days: Confusion Assessment Method for ICU (CAM-ICU), CAM, 4'A's Test and Delirium Observation Screening (DOS) Scale.

Results: The POD incidence of the subgroup patients aged 70 years and older was 26%. The results of our multivariable logistic regression model showed POD as an independent predictor for a prolonged length of stay (LOS) in ICU (36%, 95% CI: 4–78%, p< 0.001) and in hospital (22%, 95% CI: 4–43%, p< 0.001).

The frequency of POD in cardiology study participants coded by hospital staff with ICD F05.0 (delirium without dementia) and F05.8 (other form of delirium) was considerably lower than the positive POD test results detected by study staff (Table 1).

Conclusions: POD has an independent impact on LOS in ICU and in hospital. Furthermore, POD is highly underdiagnosed in clinical routine.

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	Total	POD group F05.0	F05.8	POD group PROPDESC
	n	% (n)	% (n)	% (n)
Heart valve surgery				
University hospital	94	14.9 (14)	3.2 (3)	59.6 (56)
CABG				
University hospital	87	8.1 (7)	3.5 (3)	35.6 (31)
Complex intervention				
University hospital	7	0.0	14.3 (1)	71.4 (5)
ICU complex treatment				
University hospital	10	60.0 (6)	20.0 (2)	90.0 (9)
Ventilation > 24 hours				
University hospital	31	12.9 (4)	6.5 (2)	35.5 (11)
Ventilation > 95 hours				
University hospital	13	23.1 (3)	0.0	38.5 (5)
Ventilation > 249 hours				
University hospital	4	50.0 (2)	0.0	75.0 (3)
Ventilation > 499 hours				
University hospital	3	33.3 (1)	33.3 (1)	100.0 (3)
Ventilation > 1799 hours				
University hospital	4	25.0 (1)	50.0 (2)	100.0 (4)

Heart valve surgery included Diagnosis Related Groups (DRG): F03A-F03C, F03E-F03F, CABG included DRGs: F05Z, F06A-F06E, Complex intervention included DRGs: F07B-F07C, ICU complex treatment included DRGs: F36A-F36C, Ventilation >24 hours included DRG: F43B, Ventilation duration >95 hours included DRGs: A13A, A13D-A13E, Ventilation duration > 249 hours included DRGs: A11A-A11B, A11E, Ventilation duration > 499 hours included DRG: A09A, Ventilation > 1799 hours included DRGs: A06A-A06B.
POD postoperative delirium, CABG coronary artery bypass grafting, ICU intensive care unit.

***PO 33** Table 1. Distribution of ICD codes and positive POD test results.*

PO 34 – ID 345

THERAPEUTIC ALGORITHMS FOR THE MANAGEMENT OF DELIRIUM IN PATIENTS WITH COVID 19

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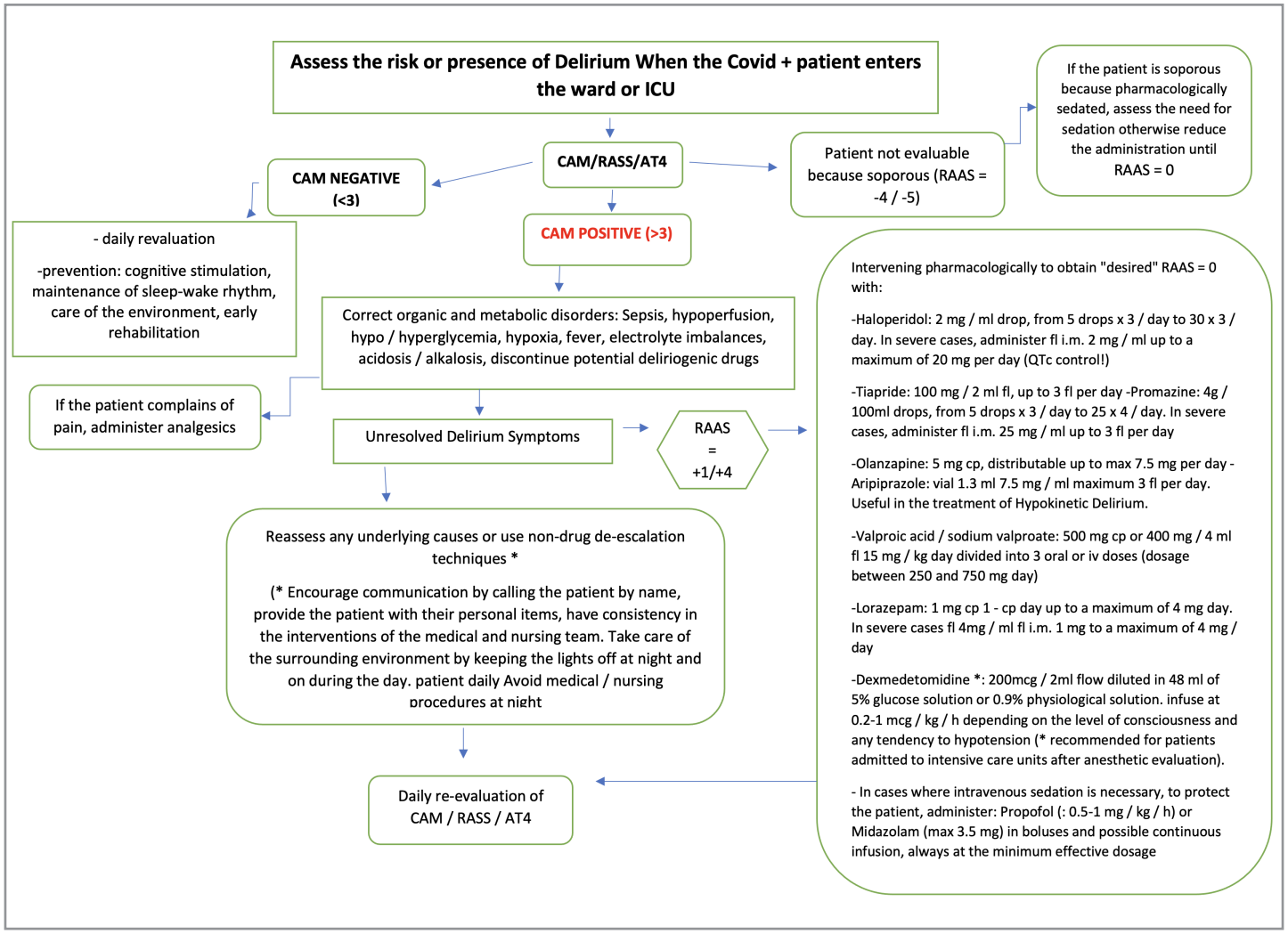
Background/Aims: Delirium is a disturbance of the state of consciousness, characterized by acute onset, fluctuating course, and transient duration associated with cognitive deficits. COVID-19 patients, especially if hospitalized in an intensive care unit, are associated with a high risk of developing delirium due to the simultaneous presence of different risk factors, among them the use of sedative drugs, the direct action of the virus, the induction of inflammatory mediators in the central nervous system and the side effects of mechanical ventilation and drugs used to treat the infection and, last but not least, isolation and restricted interaction with relatives and health professionals.

Materials and Methods: We reviewed the latest guidelines for the treatment of delirium and recommendations related to the management of delirium in COVID-19 patients, not yet standardized and continuously updated with scientific evidence.

Results: The most effective pharmacological treatment of delirium in COVID-19 patients is represented by antipsychotic drugs at different dosages, according to the severity of the symptoms: haloperidol (up to 20mg/day) represents the first-choice treatment, Promazine (up to 75mg/day) and olanzapine (up to 7.5mg/day) are the next therapeutic options available (interactions with antibiotic therapies should be considered). The benzodiazepines lorazepam (up to 4mg/day) and diazepam (up to 40mg/day) should be used with caution in case of respiratory failure. The use of sedative-hypnotics, such as dexmedetomidine and Propofol, is foreseen in case of very serious symptoms and reserved, after anesthesia-related assessments, for patients admitted to intensive care.

Conclusions: The adequate prevention and management of delirium, particularly complex in COVID 19 patients due to the numerous predisposing and precipitating factors, appears to be essential in consideration of the impact that this condition can have on the life expectancy of patients affected by the infection.



***PO 34** Figure 1.*

PO 35 – ID 347

EVOLUTION OF ATTENTION DISORDER IN PATIENTS WITH COVID-19 AND DELIRIUM

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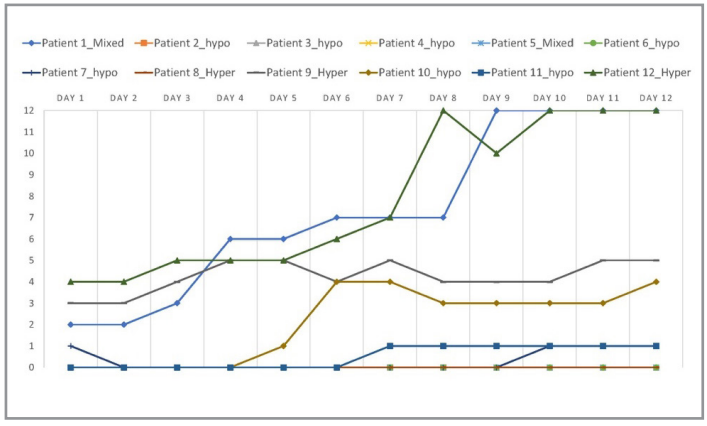
Background: Delirium represents a common complication in hospitalized older adults with COVID-19. Although inattention is a core feature of delirium and central to its diagnosis, its monitoring during an episode of delirium is not usual in routine clinical practice. The aim of our study was to describe the evolution in attention in older adults with COVID-19 and delirium.

Methods: Data were collected from older patients admitted into an intermediate care hospital, who became infected during an outbreak of covid-19. Patients infected with COVID-19 were evaluated daily with the 4 'A's test (4AT) to determine if they suffered delirium. In those that developed delirium, attention was daily measured with the test "Months Of the Years Backwards" (MOYB). Motor subtype of delirium was assessed with the modified Richmond Agitation Sedation Scale (mRASS).

Results: During January 2021, in a ward with 34 admitted older patients, 21 were infected by COVID-19 (65% women, mean age 81+7.8, 43% with cognitive impairment). Of these, 12 developed delirium. Patients with hypoactive delirium (n=7) presented worse results in the attention test, with ranges between 0 and 3 points in the MOYB test, with no improvement over the days. In contrast, among patients with hyperactive or mixed delirium (n=5), a progressive improvement was observed in the MOYB test throughout the days.

Conclusions: In older patients with COVID-19 and delirium, monitoring the evolution of attention disorder may help to anticipate resolution of delirium in patients suffering from the hyperactive or mixed subtypes, but it may not be useful for patients with hypoactive delirium.



PO 35 *Figure 1. Evolution of Inatenttion in patients with COVID-19 and Delirium.*

PO 36 - ID 357

SURVEY OF CLINICAL FOLLOW-UP CURRENTLY OFFERED TO PEOPLE DEVELOPING DELIRIUM AFTER ELECTIVE ARTHROPLASTY

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Background/Aims: Post operative delirium (POD) is a serious adverse event of elective arthroplasty surgery occurring after approximately 17% of surgeries. POD is associated with short- and long-term cognitive decline including an increased risk of developing dementia. Despite this, it is unclear if any routine clinical follow-up services are available for these patients post-discharge. In this study an online survey was devised with the aim of surveying clinicians in the United Kingdom (UK) and Republic of Ireland (ROI) to determine what current follow-up services are available.

Materials and Methods: An email invitation to complete a concise online survey consisting of multiple choice and free text questions was distributed to relevant clinicians in the UK and ROI by non-NHS professional bodies and the authors. Twitter was used to highlight the survey.

Results: 43 clinicians participated in this survey. 18 (42%) respondents indicated that delirium is routinely screened for post elective arthroplasty and 17 respondents stated that the 4AT tool is used. The majority of respondents (62%) indicated that delirium is documented upon discharge to a patient's GP. Only 11 respondents (26%) describe routine clinical follow-up practices. These included a joint arthroplasty clinic, geriatric outpatient department and liaison psychiatry.

Conclusions: Results of this survey suggest that post-arthroplasty delirium screening is not yet widespread and standardised clinical follow-up services are lacking in the UK and ROI. There is a need to improve upon these clinical follow-up services in order to diagnose and mitigate the poor long-term outcomes associated with post-operative delirium.

PO 37 – ID 359

PHARMACOLOGICAL MANAGEMENT OF DELIRIUM IN PATIENTS WITH LIVER DISEASE

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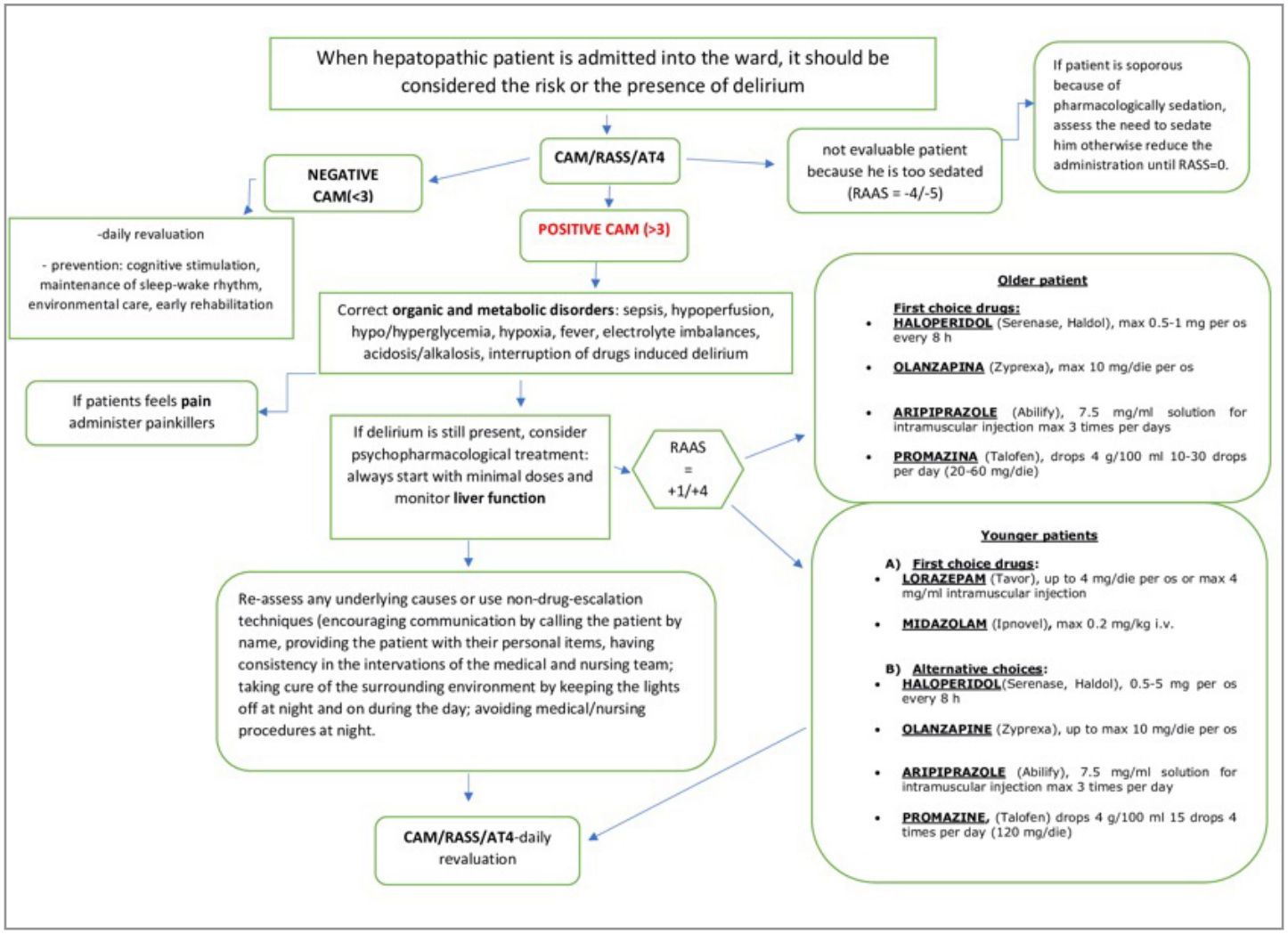
Background/Aims: Delirium can be defined as an abrupt change in the state of mind that can be associated with a significant fluctuating disturbance of attention, cognitive state, and level of consciousness. It is caused by organic disease or drug interruption, and it is fundamental to have the ability to recognize the contributing factors to prevent it. The importance to increase the knowledge about delirium comes from the mortality rates, the intra-hospital complications, and the risk of institutionalization connected to it. Our research aims to provide information about the pharmacological management of delirium in patients with liver disease, such as hepatic encephalopathy or hepatic failure, in order to choose the appropriate medication and select dosages, according to primary organic and metabolic disorders.

Materials and Methods: We analyzed several studies and data from research carried out in the last four years concerning drug safety profiles of medication used to treat delirium in liver disease patients. We assumed the treatment changes depending on the subjects' age: consequently, two different types of populations - under 65 and over 65 years old - were selected.

Results: Appropriate treatment of delirium in liver disease patients involves the use of benzodiazepines and antipsychotics. In patients < 65 years old the first-line therapy is represented by benzodiazepines, such as lorazepam (up to 4mg/day) and midazolam (max 0.2 mg/kg i.v.), conversely, in patients > 65 years the first-chose drugs are antipsychotics, such as Haloperidol (up to 3mg/day) and olanzapine (up to 10mg/day).

Conclusions: Delirium increases healthcare costs, and hurts the psychophysical well-being of patients and caregivers. For this reason, it should be considered the possibility to continue the studies on this topic in order to prevent delirium and treat it appropriately when it comes, trying to use medications without any risk of further compromising the health of patients.



***PO 37** Figure 1.*

PO 38 - ID 360

DUAL SENSORY LOSS AND DELIRIUM AMONG MEDICARE BENEFICIARIES

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Background/Aims: Sensory impairment is highly prevalent among older adults and may represent a modifiable risk factor to target for delirium prevention. While hearing and vision have individually been associated with delirium, few studies have accounted for the combined effect of concurrent vision and hearing impairment which limits sensory substitution, a common method of compensation among those with sensory impairment.

Materials and Methods: This cross-sectional analysis used pooled data from the 2016 and 2017 Medicare Current Beneficiary Survey (MCBS), a nationally representative survey of United States (US) Medicare beneficiaries (government funded health insurance for US adults ≥ 65 years old). Delirium was identified using a validated claims-based algorithm. Sensory impairment was defined as any self-reported trouble hearing or seeing, with the use of aids, and was categorized as no sensory impairment, hearing impairment only (HI), vision impairment only (VI), and dual sensory impairment (DSI). Covariates included age, sex, education, race, and health (serious mental illness, hypertension, diabetes, stroke, depression, and dementia/ Alzheimer's).

Results: Among 2638 Medicare beneficiaries (mean age 77) who were hospitalized, 870 (33.0%) had no sensory loss, 642 (24.3%) had HI, 428 (16.2%) had VI, and 698 (26.5%) had DSI. In the sample, 214 (8.1%) experienced delirium. A higher proportion of those with DSI (11.9%) experienced delirium relative to those with HI (6.5%), HI (7.7%), and those without sensory loss (6.4%). Multivariable logistic regression suggested neither HI (OR=0.90, 95% CI 0.58-1.38) or VI (OR=1.13, 95% CI 0.71-1.179) alone were associated with delirium while those with DSI had 50% higher odds (OR=1.50, 95% CI 1.03-2.18) of experiencing delirium relative to those without sensory loss.

Conclusions: Dual sensory impairment may increase risk for delirium relative to either hearing or vision impairment alone. Future research should focus on mechanisms underlying association and determine the impact of treatment of sensory loss.

PO 39 – ID 363

FUNCTIONAL BRAIN NETWORK AND TRAIL MAKING TEST CHANGES AFTER MAJOR SURGERY AND DELIRIUM

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On behalf of the BioCog Consortium., clinicaltrials.gov identifier: NCT02265263, ethical approval number EA2/092/14 (Berlin), 14-469 (Utrecht).

Background: Delirium is a frequent complication of elective surgery in elderly patients, associated with an increased risk of long-term cognitive impairment and dementia. Disturbances in the functional brain network were previously reported during delirium. We hypothesized persisting alterations in functional brain networks three months after elective surgery in patients with postoperative delirium, and hypothesized that postoperative brain connectivity changes (irrespective of delirium) are related to cognitive decline.

Methods: Elderly patients (N=554) undergoing elective surgery underwent clinical assessments (including Trail Making Test B (TMT-B) and resting-state functional magnetic resonance imaging (rs-fMRI) before and three months after surgery. Delirium was assessed on the first seven postoperative days. After strict motion correction, rs-fMRI connectivity strength and network characteristics were calculated in 246 patients (130 patients underwent scans at both timepoints), of whom 38 (16%) developed postoperative delirium.

Results: Rs-fMRI functional connectivity strength increased after surgery in the total study population (β=0.006, 95%CI=0.000–0.012, p=0.021), but decreased after postoperative delirium (β=-0.014, 95%CI=0.000–0.012, p=0.026). No difference in TMT-B scores was found at follow-up between patients with and without postoperative delirium. Patients who decreased in functional connectivity strength declined in TMT-B scores compared to the group

that did not (β=11.04, 95%CI=0.85-21.2, p=0.034s).
Conclusions Delirium was associated with decreased functional connectivity strength three months after the syndrome was clinically resolved, which implies that delirium has lasting impact on brain networks. Decreased connectivity strength was associated with statistically significant (but not necessarily clinically relevant) cognitive deterioration after major surgery, which was not specifically related to delirium.

PO 40 - ID 370

PILOTING OF A PREOPERATIVE RISK ASSESSMENT TOOL FOR POSTOPERATIVE DELIRIUM RISK

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Background: The PIPRA algorithm preoperatively calculates the risk of patients suffering from postoperative delirium (POD). PIPRA was developed from an individual participant data meta-analysis and externally validated on retrospectively collected data. It calculates the POD risk as a percentage and groups patients into low, medium, high and very high risk. Here, we prospectively tested the feasibility and performance of the algorithm in a real-life hospital setting.
Materials and Methods: PIPRA was implemented during the pre-anaesthesia consultation in a 370 bed public hospital in Switzerland. Patients aged 65 years and older, and undergoing hip and knee surgeries, were included over a period of 6 months from September 2021. Patients undergoing emergency surgery were excluded. The calculated delirium risk and the delirium outcome were collected anonymously for each patient, together with the overall Delirium Observation Screening Scale (DOS) compliance and a survey on usability and any comments from clinicians.
Results: Of 155 patients, a POD risk score was calculated for 153 (compliance 98.7%) and the overall compliance to DOS was 69%. Seven patients were DOS positive (4.5%). The discrimination of the algorithm was excellent, with an AUC of 0.95 (95% CI: 0.89-1.00). 111 patients (73%) were characterized as low risk and none had a positive DOS. Notably, while only nine patients (6%) were classed as "very high risk", five out of the seven cases (71%) of DOS positive patients were in this risk group. The survey showed that the clinicians were concerned about lack of consequences from identifying patients at risk.
Conclusions: While the algorithm showed excellent discrimination, the compliance to DOS was only 69% and likely biased towards higher risk patients, which may have inflated the results. The survey shows the need for integrating the risk assessment within hospital procedures and, especially, informing ward and nursing staff about which patients are at risk of developing POD.

PO 41 – ID 374

PROTOCOL OF THE "SENSE LLIGAMS EFFECTIVENESS STUDY"

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Background: Physical restraints are strongly related to severe adverse events and current scientific evidence restrings their use only as a very last option, nevertheless, many older patients are still being physically contained during hospitalization. To reduce physical restraints, the "Sense LLigams" program was implemented in an intermediate care hospital in 2018. In this non-pharmacological intervention, we developed a personalized care plan with environment adaptations and a multicomponent intervention based on the patients' needs and objectives.
Aim: To evaluate whether the implementation of this program has an impact not only on prevalence of physical restraints, but also on delirium incidence and reduction of chemical restraints.
Methods: We will conduct an observational, prospective, and quasi-experimental study with a control group. Data from older adults admitted to the intervention ward will be collected and compared to patients admitted to a usual care ward in the same hospital at the same time (from October 2022 until February 2023). Data collection will include sociodemographic, clinical and geriatric assessment variables. The reason and type of physical and/or chemical restraints during admission will be collected. Delirium will be assessed during admission with the 4"A" Test (4AT) by trained nurses. The study will include a quality analysis to evaluate the satisfaction of clinical staff, patients and caregivers.
Discussion: Final results are expected by March 2023. The study will provide relevant information on the impact and side effects of this non-pharmacological, shared-decision and person centered intervention in older adults admitted to intermediate care. A reduction of physical and chemical restraints would reduce delirium incidence and its negative consequences, therefore increasing person's health-related quality of life and wellbeing.

PO 42- ID 375

INAPPROPRIATE PRESCRIPTION OF CENTRAL NERVOUS SYSTEM MEDICATIONS IN PATIENTS WITH DEMENTIA

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Background/Aims: Evidence shows that treatment of dementia patients leads to inappropriate prescription (IP). Our objective is to determine the prevalence of central nervous system (CNS) polypharmacy and antipsychotics in patients with dementia, detect IP, assess the impact of a medication review (MR) by applying a person centered prescription model (PCP) and appraise the level of implementation of our recommendations 3 months after discharge including the reduction of polypharmacy and antipsychotics

Materials and Methods: Quasi-experimental study (pre-post, September 2021-February 2022, 3 months follow-up). An interdisciplinary healthcare team (psychogeriatric physician and pharmaceutical consultant team) applied a PCP model to review pharmacotherapeutic plans in patients with dementia admitted in a psychogeriatric unit. Medications were classified according to the anatomical therapeutic chemical (ATC) system.

Results: N=78. Mean age 84.2537.8. 66.7% women. The Barthel index and the Frail-VIG[1] were calculated (mean of 42.21326.5, 0.4730.09 respectively). 61.5% had advanced dementia (GDS≥6C). 14 patients died during follow-up.
The mean of the total amount of medications was 8.1933.6 preRM and 5.4632.9 postMR (P<0.001). The preMR of CNS polypharmacy (≥3 pharmacs) was 55.1%, postMR was 43.4%. The preRM CNS medications were 3.0031.6 and postRM were 2.3431.6 (p<0.01). After MR, 28.9% of patients ended without polypharmacy. At hospital admission 66.7% of patients had antipsychotic prescription versus 53.7% after MR. The mean of antipsychotics preMR was 0.8230.7 and postMR was 0.6630.7 (p=0.015). CNS medications IP was detected in 40% of patients. The prescription modifications were implemented at 82.88%.

Conclusions: A MR based on a PCP model allows the reduction of CNS medications and antipsychotics prescription in patients with dementia hospitalized in a psychogeriatric ward of an intermediate care hospital.

	PreMR	PostMR	P value
Total medications	8.19±3.6	5.46±2.9	<0.001
CNS medication	3.00±1.6	2.34±1.6	<0.001
Antipsychotics	0.82±0.7	0.66±0.7	<0.015

***PO 42** Table 1. Mean of medications pre and post MR.*

PO 43 – ID 376

DELIRIUM AND CLUSTERS OF OLDER PATIENTS AFFECTED BY MULTIMORBIDITY IN ACUTE HOSPITALS

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Background/Aims: Delirium is commonly seen in older adults with multimorbidity, during a hospitalization, resulting from the interplay between predisposing factors such as advanced age, frailty, and dementia, and a series of precipitating factors. The association between delirium and specific multimorbidity is largely unexplored so far although of potential key relevance for targeted interventions. The aim of the study was to check for a potential association of multimorbidity with delirium in a large cohort of older patients hospitalized for an acute medical or surgical condition.

Materials and Methods: Design: This is a cross-sectional study nested in the 2017 Delirium Day project.Setting and participants: The study includes 1829 hospitalized patients (age: 81.8, SD: 5.5). Of them, 419 (22.9%) had delirium.

Methods: Sociodemographic and medical history were collected. The 4AT was used to assess the presence of delirium. The Charlson Comorbidity index was used to assess multimorbidity.

Results: The results identified neurosensorial multimorbidity as the most prevalent, including patients with dementia, cerebrovascular diseases, and sensory impairments. In light of the highest co-occurrence of 3 neurosensorial chronic conditions, we could hypothesize that a baseline altered brain functional and neural connectivity might determine the vulnerability signature for incipient overall system disruption in presence of acute insults.

Conclusions: Eventually, our findings moved a step forward in supporting the key importance of routine screening for sensory impairments and cognitive status of older patients for the highest risk of in-hospital delirium. In fact, preventive interventions could be particularly relevant and effective in preventing delirium in such vulnerable populations and might help refining this early diagnosis.

Empty Cell	No Delirium (n = 1410)	Delirium (n = 419)	*P* Value	*P* Value Adjusted
Age, mean (SD)	80.4 (10.5)	84.8 (7.4)	<.001	<.001
Women, n (%)	774 (54.9)	248 (59.2)	.12	.27
Chronic diseases				
Myocardial infarction, n (%)	270 (19.2)	73 (17.4)	.43	.67
Heart Failure, n (%)	422 (29.9)	129 (30.8)	.74	.84
Peripheral vascular arterial disease, n (%)	349 (24.8)	104 (24.8)	.99	.99
Cerebrovascular disease, n (%)	389 (27.6)	203 (48.5)	<.001	<.001
Dementia, n (%)	180 (12.8)	248 (59.2)	<.001	<.001
Chronic lung disease, n (%)	284 (20.1)	68 (16.2)	.078	.080
Connective tissue, n (%)	38 (2.7)	14 (3.3)	.50	.67
Ulcer, n (%)	76 (5.4)	16 (3.8)	.25	.48
Diabetes, n (%)	250 (17.7)	60 (14.3)	.12	.27
Mild liver disease, n (%)	70 (4.9)	17 (4.1)	.51	.67
Moderate-severe nephropathy, n (%)	287 (20.4)	98 (23.4)	.15	.31
Diabetes with organ damage, n (%)	164 (11.6)	43 (10.3)	.44	.67
Solid tumor, n (%)	213 (15.1)	62 (14.8)	.88	.92
Leukemia, n (%)	22 (1.6)	9 (2.2)	.42	.67
Lymphoma, n (%)	28 (2.0)	7 (1.7)	.68	.84
Moderate severe liver disease, n (%)	48 (3.4)	15 (3.6)	.86	.92
Tumor with metastasis, n (%)	76 (5.4)	19 (4.5)	.49	.67
Human immunodeficiency virus, n (%)	5 (0.4)	1 (0.2)	.72	.84
Hemiplegia, n (%)	46 (3.3)	24 (5.7)	.023	.072
Visual impairment (n = 1553)	164/1174 (14.0)	83/379 (21.9)	<.001	<.001
Hearing impairment (n = 1553)	192/1174 (16.4)	114/379 (30.1)	<.001	<.001
Both visual and hearing impairment (n = 1553)	276/1174 (23.5)	140/379 (36.9)	<.001	<.001
Charlson Index score, median (interquartile range)	3 (1–4)	3 (2–5)	.001	.001

PO 43 *Table 1. Demographic and Clinical Characteristics of Patients on the Basis of Delirium Diagnosis.*

Empty Cell	OR (95% CI),	*P* Value	*P* Value Adjusted for Multiple Comparisons	AUC
Age	1.01 (0.99–1.03)	.12	.19	0.778
Cerebrovascular disease	1.40 (1.06–1.86)	.018	.048	
Dementia	8.08 (6.10–10.70)	<.001	<.001	
Chronic lung disease	0.76 (0.54–1.09)	.14	.19	
Hemiplegia	1.85 (1.02–3.38)	.045	.090	
Visual impairment (n = 1553)	1.08 (0.75–1.55)	.69	.69	
Hearing impairment (n = 1553)	1.60 (1.14–2.25)	.006	.024	
Charlson Comorbidity Index score	0.99 (0.94–1.03)	.52	.59	

PO 43 *Table 2. Multivariable Logistic Regression Analysis Assessing the Association of Demographic and Clinical Conditions With Delirium.*

PO 44 – ID 377

BIOMARKERS OF DELIRIUM RISK IN OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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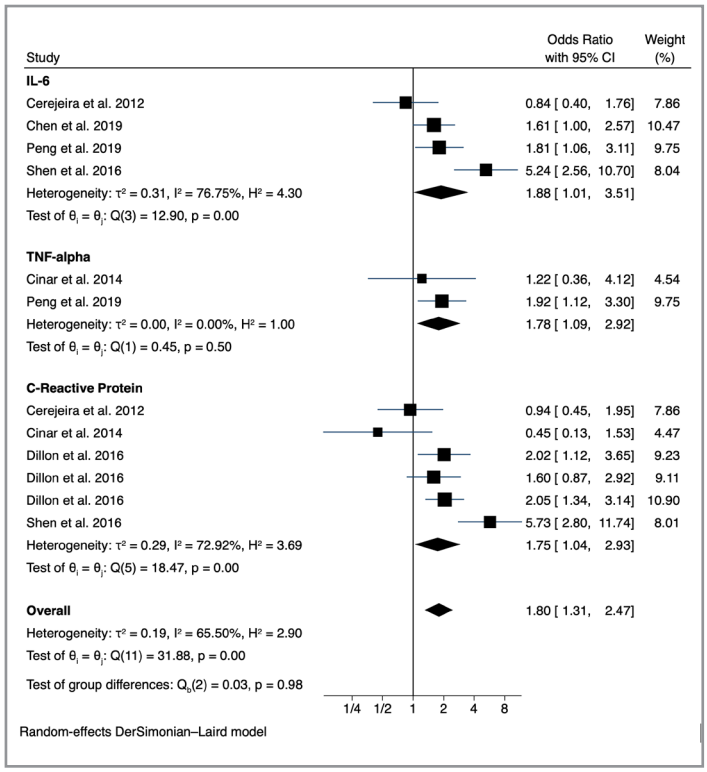
Background: Delirium is a common and severe neuropsychiatric syndrome associated with increased morbidity and mortality in older patients. The aim of this study was to identify predictive biomarkers of delirium in older patients through a systematic review and meta-analysis.

Materials and Methods: A systematic review of literature published up to August 2021 in MEDLINE, EMBASE, The Cochrane Library, Web of Science and Scopus was independently conducted by two authors. Inclusion criteria were: 1) observational case-control, cohort studies or case series in patients >65 years in which predictive biomarkers of delirium in blood or cerebrospinal fluid (CSF) had

been collected, 2) delirium was identified with Diagnostic Statistical Manual of Mental Disorders criteria (DSM), International Classification of Diseases (ICD) or a brief tool based on these criteria, 3) studies were of high-quality (7 to 9 stars in the Newcastle-Ottawa scale risk of bias). Reviews, case reports, comments, letters, personal opinions, book chapters, conference abstracts and randomized controlled trials (RCTs) were excluded.

Results: Of 2518 articles screened, a total of 32 observational studies were included. Delirium assessment methods varied and included the Confusion Assessment Method (CAM), CAM-Intensive Care Unit (CAM-ICU) and DSM criteria. Overall, 7 different types of biomarkers were identified: neurotransmitters, hormones, biomarkers of neuronal damage, biomarkers of neuroinflammation, markers of dementia, genetics and metabolomics. Most studies were investigating neuroinflammation molecules in orthopedic surgery settings. In the meta-analysis, C-reactive protein (OR 1.75, 95% CI 1.04-2.93, 6 studies), Interleukin-6 (OR 1.88, 95% CI 1.01-3.51, 4 studies) and Tumour Necrosis Factor alpha (OR 1.78, 95% CI 1.09-2.92, 2 studies) were significantly associated with delirium risk.

Conclusions: A broad array of biomarkers has been reported to predict delirium in older adults. Although current evidence does not favour the use of any particular biomarker, our findings could help establish a consensus.



***PO 44** Figure 1.*

PO 45 – ID 379

IN OLDER HIP FRACTURE PATIENTS, POSTOPERATIVE DELIRIUM WAS SIGNIFICANTLY ASSOCIATED WITH PRE-MORBID COGNITION, BUT NOT WITH SERUM OR CEREBROSPINAL FLUID CYTOKINES

Lucía Lozano Vicario[1], Román Romero-Ortuno[2], Bernardo Abel Cedeño-Veloz[1], Joaquín Fernández-Irigoyen[3], Enrique Santamaría[3], Fabricio Zambom-Ferraresi[4,5], Fabiola Zambom-Ferraresi[4], Antón De la Casa-Marín[4], Iranzu Ollo-Martínez[4], Marina Sánchez Latorre[1], Mikel Izquierdo[3], Nicolás Martínez-Velilla[1,4,5]

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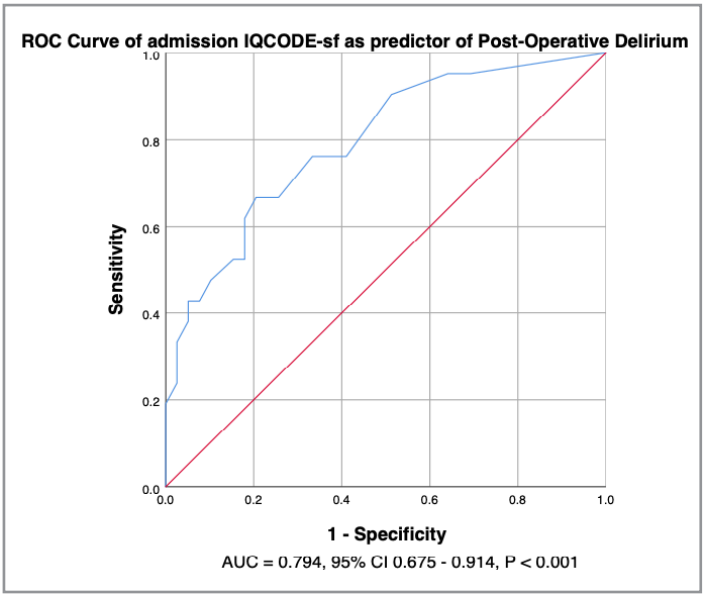
Background: Postoperative delirium (POD) is a common neuropsychiatric complication in hip fracture patients after surgery that is associated with higher morbidity, mortality and worse functional and cognitive recovery. Both clinical characteristics and biomarkers (e.g., cytokines) have been proposed as risk factors for POD, but how they compare is debated. The aim of this study was to identify clinical risk markers of POD among older adults with hip fracture and compare their ability to predict POD with that of serum and cerebrospinal fluid (CSF) cytokines.

Materials and Methods: 60 hip fracture patients aged 75 or older without delirium on admission were recruited at Hospital Universitario de Navarra (Pamplona, Spain). A Comprehensive Geriatric Assessment was completed before surgery and POD was determined daily until discharge using the 4-AT tool. Additionally, blood and CSF samples were collected before surgery and 48 cytokines were analyzed with Olink® in 30 patients (15 with POD and 15 without POD). Binary logistic regression was used to establish independent associations with POD. The area under the curve (AUC) statistic was calculated for any significant predictor.

Results: 21 patients developed POD. In a logistic regression model including age, comorbidity (Charlson Index), handgrip strength, Mini-Nutritional Assessment, FRAIL scale, and cognitive status (Informant Questionnaire on Cognitive Decline in the Elderly short form, IQCODE-sf), the only significant association with POD was that of IQCODE-sf (Odds Ratio: 1.20, 95% CI 1.05 - 1.36, p=0.006). The AUC for IQCODE-sf as predictor of POD was 0.79 (95% CI: 0.68-0.91, p<0.001). In the subsample of n=30, controlling by

IQCODE-sf none of the serum or CSF cytokines analyzed were significantly associated with POD.

Conclusions: In our sample, pre-morbid cognition was a significant predictor of POD, independently of other clinical characteristics. However, cytokines were not predictive of POD. Our findings favour a clinical approach to delirium risk detection.



***PO 45** Figure 1.*

PO 46 – ID 390

A SYSTEMATIC REVIEW OF MODIFIED ELECTROCONVULSIVE THERAPY (ECT) TO TREAT DELIRIUM

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Background: Delirium is costly for patients, carers and healthcare systems. In addition, non-pharmacological and pharmacological management of delirium may often be ineffective. ECT has been proposed and used as a treatment of delirium in clinical practice. However, the efficacy and safety of this approach are not well understood.

Methods: A systematic review was completed according to PRISMA guidelines using PubMed, CINAHL, Cochrane Library, and PsycINFO. Studies were eligible for inclusion if there was a diagnosis of delirium, and modified ECT was used to treat delirium symptoms. ECT for delirium in people with dementia, neuroleptic malignant syndrome, catatonia, or confusional states associated with acute primary psychiatric conditions were excluded. All included records were first ranked using the hierarchy of evidence-based medicine; quality was then assessed using the Joanna Briggs critical appraisal checklists. Pooled data across the cases identified were analysed using descriptive statistics.

Key Findings: Of 1226 records screened, ten studies met inclusion criteria: six case reports, three case series, and one quasi-experimental study. The literature base was of mixed quality. The single quasi-experimental study was assessed to be of 'fair' quality, with the remainder of the cases series and case reports were rated as 'poor' to 'fair' quality. The included records described a total of 40 individual people with delirium who had been treated with ECT. In 33/40 cases, the aetiology of delirium was substance withdrawal. The most commonly reported ECT placements were bilateral (4/40, 10%) and bitemporal (5/40, 12.5%), although this data was missing in 29/40 cases (72.5%). The number of ECT treatments administered ranged from 1-13. ECT was reported to positively contribute towards treatment of delirium in all cases, although objective measures of improvement were reported in only 6/13 patient cases from case reports and case series (46%). The singular quasi-experimental study reported a statistically significant decrease in duration of delirium, time spent in physical restraint, and in benzodiazepine requirement when ECT was used as an adjunct in benzodiazepine withdrawal delirium. When adverse events were described these included mild confusion and memory deficits; all reported as time limited and reversible. Considerable limitations in the quality of the evidence base were identified, including the risk of selection, publication and reporting bias. Much data reporting on safety and efficacy of ECT in delirium was missing.

Conclusions: There is insufficient literature to support modified ECT as a clinical treatment for delirium. The few studies identified were generally of weak evidence which lacked important data on safety and objective outcome measures, and did not include populations with broad delirium aetiologies. Further research using more robust methodologies and broader populations (age, aetiology) of people with delirium treated with ECT are needed.

PO 47 - ID 398

LIVE AND RECORDED MUSIC INTERVENTIONS FOR MANAGEMENT OF DELIRIUM SYMPTOMS IN ACUTE GERIATRIC PATIENTS: PROTOCOL FOR A RANDOMIZED FEASIBILITY TRIAL

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Background/Aims: Delirium is a neuropsychiatric syndrome characterized by an acute alteration in attention, awareness, arousal, and cognition, precipitated by a sudden illness, intoxication, trauma, or surgery. It is highly prevalent in older, frail and acutely hospitalized patients, and associated with poor outcomes, with few effective treatment alternatives. Non-pharmacological interventions and music show promising effects. We aim to study the feasibility and the potential effectiveness of music interventions (MIs) delivered by a credentialed music therapist, for regulating delirium symptoms in acute geriatric patients, as well as the sensitivity of standardized delirium assessment tools and procedures for detecting observable responses.

Materials and Methods: Acute geriatric patients with delirium or subsyndromal delirium (Diagnostic and Statistical Manual of Mental Disorders) will be randomized to intervention with either Preferred Recorded Music (PRM) (n=30), or Preferred Live Music (PLM) (n=30). Each intervention will be delivered for 30 minutes, over three consecutive days. Delirium symptoms will be assessed before and after each session. Main feasibility outcome measures are recruitment rate, treatment fidelity, adherence, and feasibility and accuracy in data collection procedures. Changes in delirium symptoms will be assessed using Observational Scale of Level of Arousal, Richmond Agitation Sedation Scale, and tests for attention and cognition. Frailty status, severity of acute illness, cognitive function at discharge, duration of delirium, length of hospital stays, and use of PRN medication (benzodiazepines and antipsychotics) will also be registered. Ethical approval has been obtained and the trial was registered at Clinical Trials, ID: NCT05398211.

Conclusions: This trial will provide results needed to design a subsequent sufficiently powered effect-study of music interventions for delirious patients. Findings will inform expected recruitment, sample-size, implementation and acceptability of music interventions, tolerability by patients of repeated delirium assessments, and possible expected effects on individual symptom domains of delirium.

PO 48 - ID 399

USING VIRTUAL SIMULATION AS A METHOD TO RESEARCH THE PERFORMANCE OF HOSPITAL STAFF MANAGEMENT OF PAIN-RELATED AGITATION IN A PATIENT WITH DELIRIUM SUPERIMPOSED ON DEMENTIA

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Background/Aims: Cognitively impaired hospital patients often experience agitation and aggression due to pain. Agitation complicates care, increasing the risk of adverse outcomes and patient-to-nurse violence. Literature suggests nurses may rely on antipsychotics while missing other more appropriately targeted treatments. However, nurses' management of agitation lacks research and practice remains unclear.

Objective: To investigate hospital nurses' management of pain-related agitation in cognitively impaired patients.

Design: A descriptive correlational study using virtual simulation.

Setting and participants: Registered medical and surgical nurses (n=274) from ten public hospitals in Queensland, Australia.

Methods: Nurses undertook a virtual simulation requiring them to manage agitation in a patient with dementia and an injury. Nurses also completed a post-simulation questionnaire. Their simulation performances were correlated with demographics like seniority, workplace, training, experience, and gerontology-specific knowledge. Constructed from an original, validated vignette, the simulation included branching pathways, video scenarios, and an avatar that could converse with participants. The study was framed within a dual processing perspective using Ericsson's Expert Performance Approach methodology.

Results: In a large highly representative sample of acute-care nurses (chi squared goodness-of-fit), thirteen nurses (4.7%) recognized and treated the virtual patient's agitation as pain-related. Most nurses (89%) gave antipsychotics of which 207 (78%) gave these first-line and 102 (38%) used them twice. Independent of other variables, nurses most likely to diagnose pain were dementia-unit nurses (OR=8.7), surgical-unit nurses (OR=7.3), and senior nurses (OR=5).

Conclusions: This study revealed that most hospital nurses struggle to identify and treat pain-related agitation in cognitively impaired patients. In a highly representative sample of medical and surgical nurses, pain, a treatable cause of agitation, was missed by 95% of participants, and 89% of participants administered antipsychotics instead. Inadequate patient assessments preceded most decisions

Analgesia administration *(R^2= 0.441)*

Variables	Categories	*B*	SE	*p*	OR	(95% CI)
Seniority level	Grd-6+ vs Grd-5	1.617	0.757	0.033*	5.04	(1.14 – 22.21)
Type of workplace unit	Surg vs Med	1.991	0.900	0.027*	7.32	(1.25 – 42.72)
	DDU vs Med	2.165	1.100	0.049*	8.71	(1.01 – 75.25)
Past specialty service(s) experience	DDU vs nil	4.762	2.968	0.109	116.95	(0.35 – 39262.32)
	GEMS vs nil	2.049	1.335	0.125	7.76	(0.57 – 106.24)
	Speciality vs none	-5.687	3.047	0.062	0.003	(0.00 – 1.33)
Info-gathering	Asked about pain vs nil	1.522	0.762	0.046*	4.58	(1.03 – 20.39)
	Assess unmet needs vs nil	2.766	1.269	0.029*	15.90	(1.32 – 191.21)
	Review medications vs nil	2.746	1.133	0.015*	15.57	(1.69 – 143.47)
Constant		-8.970	2.003	<0.001	<0.001	

Antipsychotics – 1st line administration *(R^2= 0.278)*

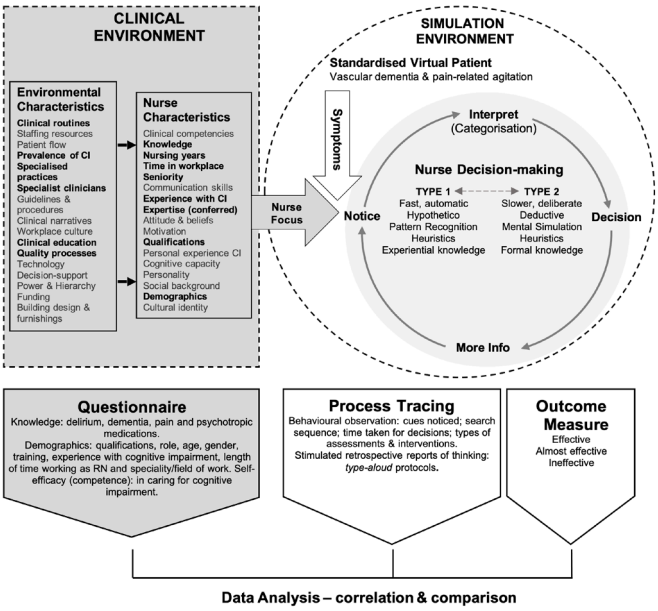
Variables	Categories	*B*	SE	*p*	OR	(95% CI)
Hospital Facility	H2 vs H1	0.615	0.812	0.448	1.851	(0.38 – 9.09)
	H3 vs H1	-1.562	0.672	0.020*	0.210	(0.06 – 0.78)
	H4 vs H1	-0.448	0.799	0.575	0.639	(0.13 – 3.06)
	H5 vs H1	-0.311	0.659	0.637	0.732	(0.20 – 2.67)
	H6 vs H1	-0.692	0.757	0.361	0.501	(0.11 – 2.21)
	H7 vs H1	-0.530	0.660	0.421	0.588	(0.16 – 2.14)
	H8 vs H1	-0.679	0.661	0.305	0.507	(0.14 – 1.85)
	H9 vs H1	0.186	0.823	0.821	1.205	(0.24 – 6.04)
	H10 vs H1	-0.598	0.659	0.364	0.550	(0.15 – 2.00)
Seniority level	Grd-6+ vs Grd-5	-0.291	0.345	0.399	0.748	(0.38 – 1.47)
Type of workplace unit	Surg vs Med	0.080	0.386	0.836	1.083	(0.51 – 2.31)
	DDU vs Med	-0.501	0.642	-0.434	0.606	(0.17 – 2.13)
Past speciality service(s) experience	DDU vs nil	-0.779	0.409	0.056	0.459	(0.21 – 1.02)
	Brain unit vs nil	-0.663	0.753	0.379	0.516	(0.12 – 2.25)
	GEMs vs nil	0.095	0.622	0.879	1.099	(0.38 – 1.47)
Info-gathering	Establish baseline vs nil	-1.508	0.562	0.007*	0.221	(0.07 – 0.67)
	Assess unmet needs vs nil	-0.397	0.382	0.298	0.672	(0.32 – 1.42)
	Review pathology vs nil	3.152	1.350	0.020*	23.386	(1.66 – 329.57)
	Number of cues vs nil	-0.217	0.058	<0.001 *	0.805	(0.72 – 0.90)
Constant		3.385	0.644	<0.001	29.514	

Antipsychotics – 2nd line administration *(R^2= 0.272)*

Variables	Categories	*B*	SE	*p*	OR	(95% CI)
Facility	H2 vs H1	-0.252	0.592	0.670	0.777	(0.24 – 2.48)
	H3 vs H1	-0.083	0.615	0.892	0.920	(0.28 – 3.07)
	H4 vs H1	0.557	0.678	0.411	1.746	(0.46 – 6.60)
	H5 vs H1	0.390	0.566	0.491	1.477	(0.48 – 4.48)
	H6 vs H1	-0.039	0.652	0.952	0.962	(0.27 – 3.45)
	H7 vs H1	0.136	0.633	0.830	1.146	(0.33 – 3.96)
	H8 vs H1	1.348	0.600	0.025*	3.849	(1.19 – 12.49)
	H9 vs H1	0.725	0.630	0.250	2.065	(0.60 – 7.10)
	H10 vs H1	0.565	0.576	0.326	1.760	(0.57 – 5.44)
Seniority level	Grd-6+ vs Grd-5	0.239	0.316	0.449	1.270	(0.68 – 2.36)
Previous work	AIN/EN in RACF DU	0.482	0.307	0.117	1.619	(0.89 – 2.36)
Type of workplace unit	Surg vs Med	-0.076	0.333	0.820	0.927	(0.48 – 1.78)
	DDU vs Med	-1.726	0.779	0.027*	0.178	(0.04 – 0.82)
Past speciality service(s) experience	DDU vs nil	0.177	0.400	0.657	1.194	(0.55 – 2.61)
	Brain unit vs nil	0.300	0.684	0.660	1.350	(0.35 – 5.16)
	GEMS vs nil	0.258	0.545	0.636	1.294	(0.45 – 3.77)
	DDS vs nil	-0.682	0.435	0.117	0.506	(0.22 – 1.19)
Gerontological knowledge	DKS v nil	-0.130	0.054	0.015*	0.878	(0.79 – 0.98)
Info-gathering	Asked about pain vs nil	-1.002	0.415	0.016*	0.367	(0.16 – 0.83)
	Establish baseline vs nil	-1.059	0.396	0.008*	0.347	(0.16 – 0.75)
	Assess unmet needs vs nil	-0.720	0.297	0.015*	0.487	(0.27 – 0.87)
	Call doctor vs nil	0.732	0.308	0.017*	2.080	(1.14 – 3.80)
Constant		3.232	1.443	0.025	25.330	

* Statistical significance $p < 0.05$, H – Hospital, Grd-6+ – nursing grade 6 and above (includes Clinical Nurses, Clinical Facilitators, Nurse Unit Managers, Nurse Practitioners, Nurse Managers, Nurse Educators, Clinical Nurse Consultants), Grd-5 – Registered Nurses, DDU – Dementia & Delirium Unit, GEM – Geriatric Evaluation & Management Unit, Brain unit – Brain injuries unit, DDS – Dementia & Delirium Service, AIN – Assistant in Nursing, EN – Enrolled Nurse, RACF DU – Residential Aged Care Facility Dementia Unit, DKQ – Delirium Knowledge Questionnaire

PO 48 *Table 1. Final logistic regression models for analgesia, 1st line and 2nd line antipsychotic use.*



PO 48 *Figure 1. Conceptual framework and methodology of the study.*

to give antipsychotics. Using virtual simulation to research agitation management was successful in revealing a gap in nurses' practice.

PO 49 – ID 402

DELIRIUM AS AN INDEPENDENT MORTALITY RISK FACTOR

Karmele Garaioa Aranburu, Marina Sanchez Latorre, Lucía Lozano Vicario, Débora Moral Cuesta, Ana Sofía Pozo Vico, Esperanza Ciérvide-Goñi, Ramon San Miguel-Elcano, Chen Chen-huichen, Nancy Gonzales-Montejo, Zulema Hernández Amador, Belén González Glaría

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Background/Aims: Delirium is a clinical neuropsychological syndrome whose main element is the alteration of attention and level of consciousness. It has an acute onset and fluctuating course that is usually accompanied by other cognitive alterations and its incidence increases during hospitalizations. When present, it negatively marks the prognosis of the person suffering from it. The main purpose of the study is to assess whether acute confusion syndrome is an independent risk factor for mortality and if this is more accentuated in a time range within the year. It also evaluates whether the delirium-predictors and 4AT helps predict the patients' delirium manifestation.

Materials and Methods: 290 patients admitted during the months of May and June 2021 were included. We collected administrative and demographic data, comorbidities (CIRS), geriatric syndromes, functional status (Barthel, Lawton, GDS), diagnosis at discharge, data of delirium at admission (DDI), 4AT at admission, drugs at admission as well as discharge data. After a year of the discharge the

review of the 290 stories was carried out, noting if they have died and the equivalent date.

Results: Out of the 290 initial patients, 19 perished during the admission.

Out of the rest of the patients, 109 died, while 157 were alive when the follow-up happened.

59 patients were diagnosed with delirium at the first admission, 30 patients died within the year (50.8% mortality-rate).

From the remainder, 82 died at follow-up (39.8% mortality-rate).

Conclusions: This shows a statistically significant difference in the mortality-rate between the patients that had delirium diagnosed and those who didn't. There was no time frame in which the mortality was higher after the discharge.

The mortality is also higher if you have 4AT and the delirium-predictors in account, allowing us to think that they are capable of predicting the risk of delirium and so, higher mortality risk.

PO 50 – ID 405

IMPLEMENTING A STRUCTURED APPROACH FOR DETECTING AND MANAGING DELIRIUM IN A LARGE ACUTE HOSPITAL LIAISON PSYCHIATRY TEAM

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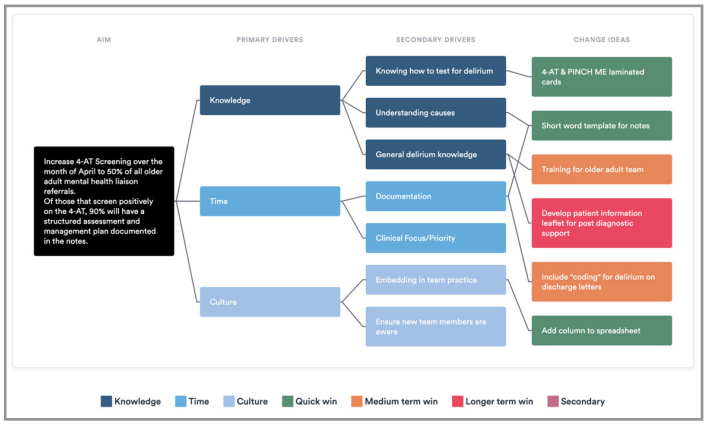
Background/Aims: Delirium is an acute change in attention, awareness, and cognition. It is strongly associated with higher mortality, estimated as 37% of people with delirium. Despite this, without routine screening, only 50% of delirium cases are detected by healthcare workers.

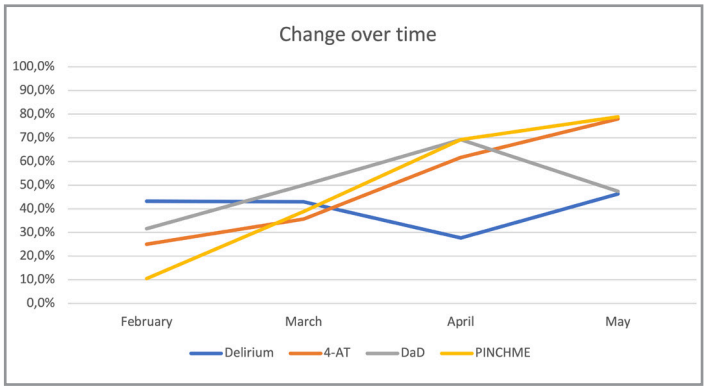
Our aim was to increase 4-AT screening to 50% of all referrals over a month-long period, with those that screen positively – 90% should have a structured assessment and management plan completed using the "PINCH ME" acronym.

Materials and Methods: We used a PDSA quality improvement framework with an associated programme theory (driver diagram) developed by the liaison psychiatry MDT (Figure 1). Key drivers identified were: knowledge, time, and culture. Sequential interventions over 4 months were: team training session; lanyard card with 4-AT and "PINCHME"; email and team checklist prompts; and an in-depth delirium education session.

Results: At baseline, only 25% of referrals were screened for delirium yet 43% received a diagnosis. Staff training and lanyard cards were introduced at the end of March, which resulted in a significant improvement in screening and management with 70% of patients having a 4-AT. Further improvement was seen after the addition of a prompt on the team spreadsheet in May, with 80% of patients screened. Structures assessment has likewise been improved from 10.5% at baseline to 78.9% in May.

Conclusions: We increased delirium screening and structured assessments in those who were delirious and met our 50% initial target for the 4-AT screening. The simple set of interventions implemented in the liaison psychiatry team led to increased delirium detection and improved structured management. We are further expanding this to increase 4-AT screening to over 90% of referrals and developing improved delirium coding by the acute trust to allow better estimation of prevalence in our acute setting.





***PO 50** Figure 1. Driver diagram of change.*

PO 51 – ID 411

DELIRIUM IN ACUTE STROKE: EPIDEMIOLOGY, RISK FACTORS AND IMPACT ON OUTCOMES.

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Background/Aims: Delirium is an acute confusional state characterized by altered level of consciousness and attention that develops over a short time and fluctuates in severity. The endpoints of our study were incidence of delirium in acute stroke, risk factors that predispose to this condition and its impact on outcomes.

Materials and Methods: Patients were consecutively enrolled in a stroke unit from April to October 2020. Inclusion criteria were age ≥ 18 years and diagnosis of acute stroke. Exclusion criteria were stroke mimics, coma, and terminal conditions. All patients were screened for delirium upon admission, within 72 h, and whenever symptoms suggesting delirium occurred by means of the Confusion Assessment Method for Intensive Care Unit (CAM-ICU) and the Richmond Agitation Sedation Scale (RASS). Outcomes were evaluated with the 90-days modified Rankin Scale (mRS) by telephone interview.

Results: The overall incidence of delirium was 36/120 (30%). Delirium was associated with aphasia (OR 9.77; CI 1.2–79.6), chronic obstructive pulmonary disease (COPD; OR 16.67; CI 1.1–263.0), deep Fazekas score (OR 5.05; CI 1.7–14.8), and physical restraint (OR 45.02; CI 1.4–1411.5). Of the 120 patients included, 17 patients were lost at the 3-months follow-up. Therefore, the final study cohort for outcome evaluation consisted of 103 patients. In the multivariate ordinal logistic regression, patients with delirium had higher mRS scores at 3 months (DLR+: mRS = 4 (3–6); DLR–: mRS =1 (1–3); OR 4.83; CI 1.88–12.35) and survival time during 90-days follow-up was shorter in the delirium group (Log Rank χ2 3.89; p = 0.048).

Conclusions: Delirium is a common complication of stroke. Delirium was associated with speech disorder, leukoencephalopathy, COPD and early use of physical restraint.

Delirium negatively impacts the prognosis of patients with acute stroke. Patients with post-stroke delirium have a worse functional outcome and a shorter survival.

	OR	Confidence interval (95%) Upper	Lower	p
Age	0,968	0,891	1,051	0,442
mRS pre-stroke	1,517	0,405	5,688	0,536
Diabetes	0,043	0,003	0,692	0,026
Atrial fibrillation	4,507	0,684	29,711	0,118
COPD	16,668	1,056	263,028	0,046
Active smoking	1,587	0,182	13,832	0,676
CNS acting drugs	6,277	0,511	77,045	0,151
Deep Fazekas score	5,047	1,718	14,827	0,003
NIHSS	1,061	0,920	1,222	0,417
Aphasia	9,775	1,201	79,570	0,033
Gaze paralysis	0,332	0,009	11,868	0,546
Containment measures	45,018	1,436	1411,486	0,030

PO 51 *Table 1.*

PO 52 – ID 413

THE DELIRIUM IN DEMENTIA ASSESSMENT SCALE (DIDAS): RELIABILITY, VALIDITY AND SENSITIVITY

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Background: To facilitate recognizing and monitoring the course of Delirium superimposed on Dementia (DSD), the Delirium-In-Dementia-Assessment-Scale (DIDAS) was developed. This study aims to assess the reliability and validity of the DIDAS, a 10-item nurses' observation scale to be used as an efficient tool to screen for symptoms and measure severity of DSD.

Methods: A cross sectional and repeated measurement study was conducted in a closed psychogeriatric unit of a general psychiatric hospital. All patients admitted were enrolled in this study to assess DIDAS' validity, reliability, discriminative power and ability to measure delirium severity.

Results: 17 patients participated (aged 76.9 [D38.02]). Internal consistency was high for the total DIDAS scores (α=0.86), as well as for patients with DSD (α=0.83) and no DSD (α=0.78).

Absolute agreement between observers ranged from 63.2-82.9% for all patients, and 49.3-79.2% for patients with DSD. A correlation was found between the mean DIDAS score per patient per day, and the corresponding Likert score for disease severity that was obtained independently. Spearman's Rho was calculated at 0.626. Mean DIDAS scores per day were statistically higher in patients with DSD compared to patients without DSD (Cohen's d 1.02). Mean DIDAS scores before and after an episode of DSD

were higher compared to DIDAS scores of patients who did not had delirium at all (Cohen's d = 0.74-0.81). Effect size (Cohen's d) on item level ranged from 0.27 to 0.72.

Conclusions: The DIDAS is a reliable instrument that can be used by nurses to follow-up on (early) symptoms of DSD dementia and measure delirium severity during the course of DSD for that it is sensitive to change. A high or rising DIDAS score should create awareness and alertness and can be used as an indication that a delirium might be emerging whereupon further diagnostics and interventions can be taken.

PO 53 – ID 418

EEG FEATURES OF A COHORT OF CRITICALLY ILL SARS-COV-2 PATIENTS WITH AND WITHOUT DELIRIUM

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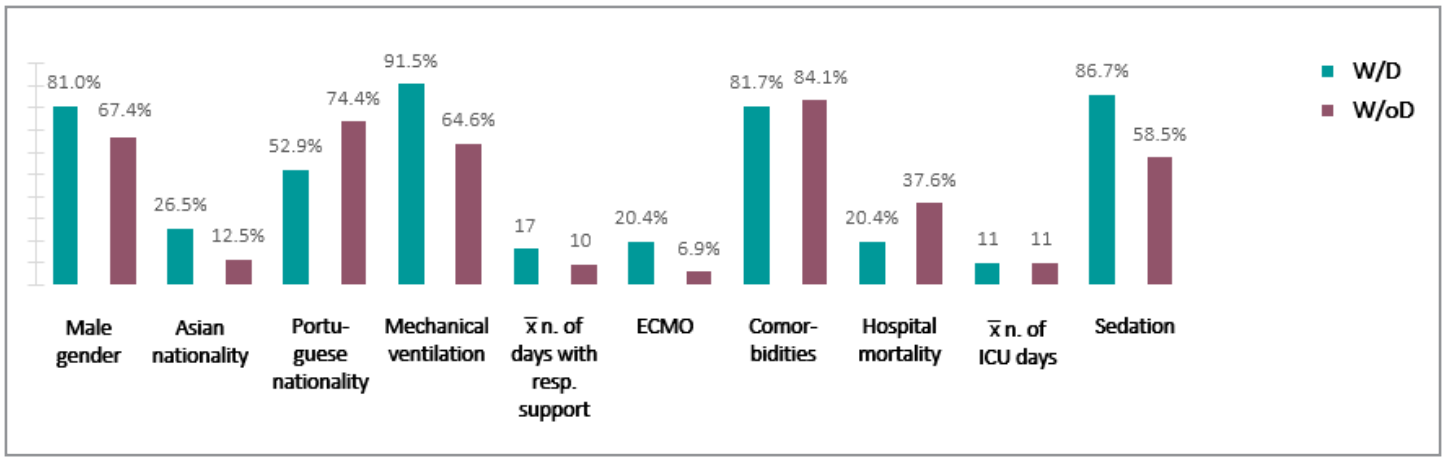
Background/Aims: Delirium has been described as a manifestation of SARS-CoV-2 and Electroencephalogram (EEG) can be a promising tool in indexing patients' vulnerability to it.

This study analyses EEG features of critically ill SARS-CoV-2 patients with (w/D) and without Delirium (w/oD).

Materials and Methods: A prospective analysis of EEG data of a cohort of 52 nonconsecutive SARS-CoV-2 patients admitted in a Portuguese intensive care unit (ICU), between 05/2021-05/2022, was conducted. 80 routine EEGs were performed at different time-points, namely on: ICU admission (w/oD and with/without sedation), 48-72h after sedation and after sedation withdrawing. In patients who didn't require sedation a second EEG was done five days after admission. EEGs were analyzed according to American Clinical Neurophysiology Society's Standardized Critical Care EEG Terminology (v.2021) by two neurophysiologists and cerebral dysfunction was graded following the Yale adult background EEG grading scale. Delirium was diagnosed according to The Confusion Assessment Method for ICU. Statistical analyses were performed using SPSS (v.26) with a significance level of $p<.05$. Variables collected were compared between patient's w/D and W/oD using T-test or Mann-Whitney U test for continuous variables and Chi-square test or Fisher's exact test for categorical variables.

Results: Of the 52 patients, 8 developed Delirium (15.4%;15 EEGs). Regarding the analyzed EEG features, there were no statistical differences between patient's w/D and w/oD. Nonetheless, patient's w/D showed a tendency for absent reactivity, absent state changes, suppressed or low voltage, absent anterior-posterior gradient, presence of rhythmic/periodic patterns and severe cerebral dysfunction.

Conclusions: Compared to other studies, our cohort shows a lower prevalence of Delirium in critically ill SARS-CoV-2 patients. Vulnerability for Delirium is not related to alterations in EEG features; however, data revealed a trend with no statistical significance. Further studies with higher number of patients would be interesting to confirm our findings.



***PO 53** Figure 1. Prevalence of EEG features in patient's w/D and w/oD.*

PO 54 – ID 419

OXIDATIVE BRAIN INJURY AND DELIRIUM IN CRITICALLY ILL PATIENTS

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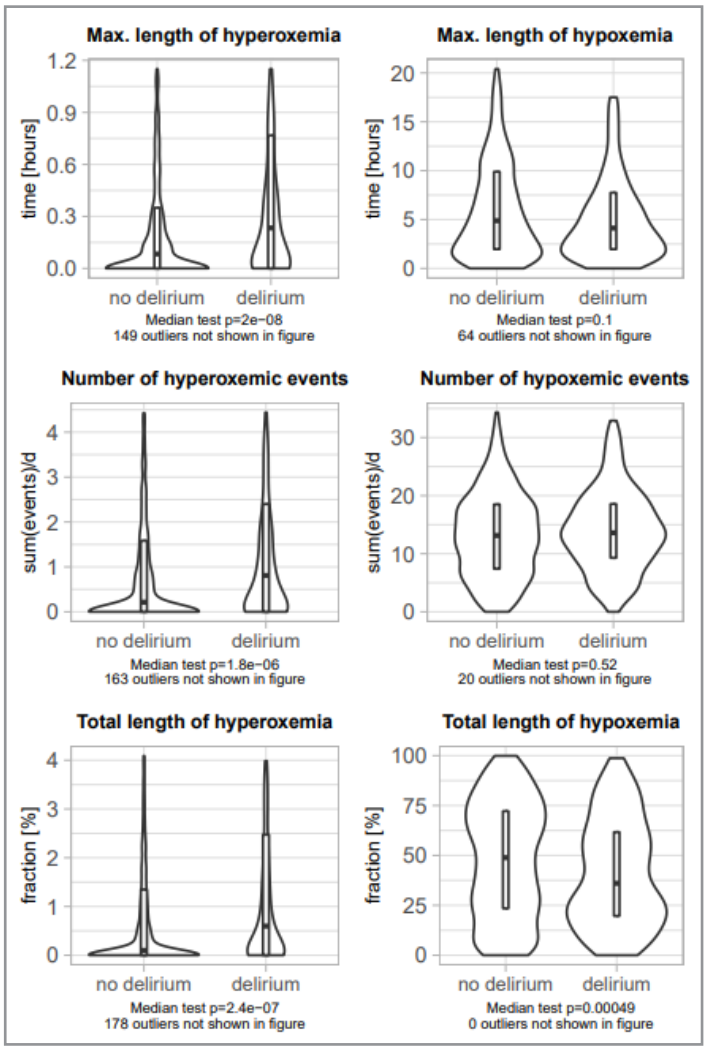
Background/Aims: The disuse of oxygen depicts a challenge in medical management due to its tight balance in several metabolic pathways. Both hypoxia and hyperoxia unchain similar cytotoxic oxidative effects, showing higher mortality by subgroups of patients. Beside other mechanisms, delirium could be an early symptom of cerebral oxidative stress. We aim to assess the influence of hypo- or hyperoxemia events as risk factors for delirium during critical care management.

Materials and Methods: Retrospective observational cohort study in patients admitted to the ICU (n=1195), assessing pulseoximetric measurements of oxygen saturation (SpO2) with a temporal resolution of 1/min. Hypoxemic intervals (SpO2 ≤89%) and hyperoxemic (SpO2 ≥98%) intervals were quantified by maximal length (maxL), cumulative events per day (cumE), and fraction of total ICU stay (fracS).

Results: Hyperoxemia showed in all aspects significant differences between delirious vs. non-delirious patients (maxL: median 13.8 vs. 4.8 minutes, adjusted p = 2^{-8}, cumE: 0.81 vs. 0.21 events per day, p=1.8^{-6}, fracS: 0.6 vs. 0.1 % p=2.4^{-7}). For hypoxemia, however, no significant difference was found for maxL (4.13 vs. 4.88 hours, p=0.1) and cumE (13.6 vs. 13.1 events, p=52), while fracS showed a higher proportion of hypoxic time in non-delirious patients (36 vs. 48.9 %, p=0.00049).

Conclusions: Prolonged intervals of hyperoxemia are correlated with the presence of delirium in ICU patients. This might result from oxidative brain injury due to excessive use of oxygen and deserves further studies.



PO 54 Figure 1.

PO 55 – ID 421

INTERPROFESSIONAL COLLABORATION AND STRUCTURED TEAM EXCHANGE MAY INCREASE DELIRIUM DETECTION RATE

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Introduction: Vulnerable, older people in acute care have a considerable risk of delirium and are also particularly affected by delirium. Close interprofessional collaboration and structured team exchange are mandatory to identify patients at risk and to detect delirious patients. To promote collaboration and exchange in a structured and systematic way, the DanA concept (Delirium-intervention in the acute-geriatric Setting. A non-pharmacological team-based approach) was developed and piloted.

Methods: The effectiveness of the DanA concept was evaluated by a 14-month study based on a pre-post-test design. The enrolled patients (n = 395) were assessed for the delirium detection rate (primary endpoint) using logistic regression. The geriatric team (n = 36) was

surveyed regarding delirium management in terms of interprofessional collaboration and team exchange before and after concept implementation.

Intervention: The core intervention of DanA concept was a delirium team briefing that considered geriatric patients (≥ 65 years) at risk of delirium (based on the 6-CIT test) and all delirious patients with regard to the CAM items (e.g. acute changes, inattention, disorganized thinking). Furthermore, the geriatric team discusses which non-pharmacological interventions are appropriate for the patient, depending on the individual risk or the clinical form and the underlying causes of delirium.

Results: The intervention group (n = 212) showed a 17.11 percent increased delirium detection rate compared to the control group (p = 0.031; CI 1.076-4.626) after concept implementation. The team was surveyed on a total of 33 team aspects before (baseline) and after concept implementation (follow-up). Teamwork and exchange were already rated with high mean values on average in the baseline. Due to the high baseline level, there are probably no statistically significant results in the follow-up survey. However, respondents tended to rate teamwork and exchange in delirium management as improved after concept implementation.

PO 56 – ID 306

VITAMIN D AS A RISK FACTOR FOR DELIRIUM: A SYSTEMATIC REVIEW AND META-ANALYSIS

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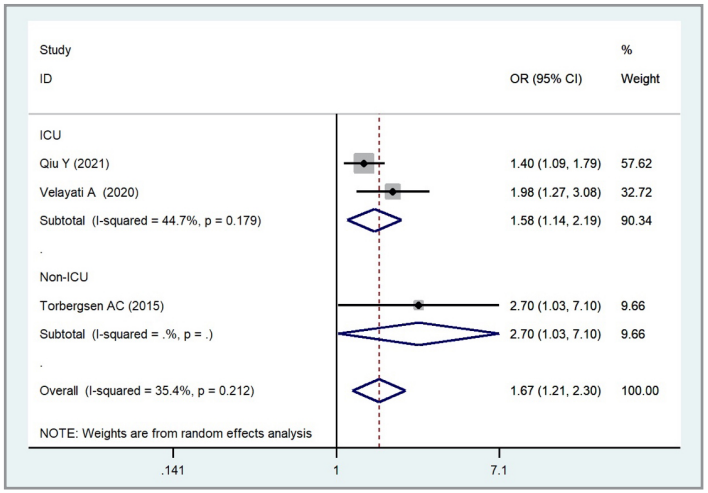
Background: Delirium is a form of acute brain dysfunction and is highly prevalent in older persons. Recent research revealed that vitamin D might have a neuroprotective role in the brain. An increasing number of studies are reporting an association between levels of vitamin D and cognition. This systematic review and meta-analysis aimed to determine whether there is an association between vitamin D levels and the development of delirium.

Materials and Methods: A systematic search was performed in the databases Pubmed, Embase, CINAHL, the Cochrane Library, and Web of Science. Articles seeking a relationship between vitamin D and the development of delirium as a primary or secondary outcome were included. The risk of bias was estimated using the Quality In Prognosis Studies tool (QUIPS). Odds ratios and hazard ratios from the studies were used to measure the effect of developing delirium. A narrative synthesis was executed, and a meta-analysis was performed only on surgical patients.

Results: This systematic review included eight observational studies (six cohort and two case-control studies). All included studies comprise a total of 357.549 patients. Seven of the eight studies concluded that low vitamin D levels were associated with an increased risk of developing delirium. When vitamin D deficiency was further classified into subgroups, usually the group with the lowest vitamin D levels had the greatest risk of developing delirium. There was a high level of heterogeneity across the studies regarding study populations, methods and adjustments for potential confounders. The result of the meta-analysis showed a significant association between vitamin D deficiency and delirium in surgical patients (OR=1.67, 95%CI: 1.21-2.30, n=3, I^2=35.4%).

Conclusions: This systematic review suggests that vitamin D levels are inversely associated with the development of delirium. However, the causality of this association could not be demonstrated. If a causal relationship could be found, checking and correcting vitamin D levels would represent a cheap and efficient way to reduce the risk of delirium. Since vitamin D deficiency and delirium are highly prevalent in older persons, this can have a major clinical impact.



***PO 56** Figure 1.*

PO 57 – ID 315

DEVELOPMENT AND OUTCOMES OF THE MDS 4-AT IN U.S. CARE HOMES USING ADMINISTRATIVE DATA

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Background: In care homes, delirium worsens morbidity, increases mortality, and impairs functional recovery. The objective of this work was to develop an operationalized measure of delirium using items from the Minimum Data

Set (MDS), a standardized quality improvement tool that is required to be completed within 7 days of admission to a care home in the United States

Materials and Methods: This retrospective study leveraged a cohort of patients (n=20,329) admitted to acute hospitals (n=129) with heart failure who were subsequently discharged to care home. We excluded patients who resided in a care home prior to admission. Using the framework and scoring of the 4-AT, MDS items were applied to the domains of alertness, orientation, attention, and acute changes. We compared the distribution of MDS 4-AT scores in those with and without dementia using ICD-9 codes from the year prior. The primary outcomes were 30-day readmission and 30 day-mortality. Logistic regression was used to adjust for demographics, comorbidities including dementia and prior utilization.

Results: In the population of 20,329, 57% (n=11652) had normal cognition, 33.3% (n=6763) had possible delirium (4-AT= 1-3), and 9.4% (n=1914) had 4-AT scores indicative of cognitive impairment. In those with an ICD code for dementia (n=6548), 4-AT scores of 1-3 were present in 48.0% (n=3143) and high 4-AT scores in 15.8% (n=1037). Each point increase in 4-AT was associated with nearly 20% increased odds of 30-day mortality (adjusted OR 1.19, 95%CI 1.17, 1.21) after adjustment. MDS 4-AT was not associated with 30-day readmission (adjusted OR= 1.01; 95%CI 0.99, 1.03).

Conclusions: Using administrative data, we developed the MDS 4-AT assessment for patients admitted to care homes after hospitalization. While further validation is needed, the MDS 4-AT has prognostic value in care home residents.

	Overall Cohort		Cohort with Dementia	
MDS 4-AT Score	N	%	N	%
0	11652	57.3	2368	36.1
1-3	6763	17.1	3143	48.0
4-12	1914	13.4	1037	15.8

PO 57 *Table 1.*

PO 58 - ID 323

POSTOPERATIVE DELIRIUM (POD) IN PATIENTS UNDERGOING MAJOR ABDOMINAL SURGERY UNDER ERAS PROTOCOL: AN OBSERVATIONAL STUDY

Elena Angeli[1], Claudia Valeria Piccolo[2], Eleonora Cappellini[2], Giovanna Calonaci[2], Luca Zoppi[2], Ilaria Di Silvestro[2], Adriana Galardi[2], Maryly Perfetto[2], Filippo Firenzuoli[2], Magda Gnesi[2], Davide Fiori[2], Filippo Nannelli[2], Tommaso Di Nardo[2], Chiara Doro[2], Francesca Falorni[2], Gabriele Baldini[2], Stefano Romagnoli[2]

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Background/Aims: The incidence of POD in patients undergoing major surgery is steadily increasing due to their progressive aging and frailty ranging for 25 to 84% in literature. Prevention strategies and the application of Enhanced Recovery After Surgery (ERAS) programs play a pivotal role. The aim of this observational single-centre study is to investigate the incidence of POD, related risk factors and post-operative complications in patients undergoing major abdominal surgery under ERAS protocols.

Methods: Patients aged≥60 scheduled for elective surgery longer than 200 min were enrolled. Core items of ERAS protocols included: opioid-sparing multimodal analgesia, no premedication, processed electroencephalographic monitoring(pEEG)-anaesthesia. Neurocognitive testing were recorded preoperatively. Confusion Assessment Method (CAM) and Confusion Assessment Method Intensive Care Unit (CAM-ICU) or 4AT's were administered at post-operative day 1 to 5.

Results: Among 99 patients enrolled, 6 developed POD (6.1%; I.C. 2,3 – 12,7%). Group who developed POD (PODg) had a preoperative cognitive impairment on the MMSE score in comparison with non-POD group (NPODg) (23.5 3 5.3 vs 30.2 3 25.9 points; $p<0.05$) and a pathological performance of the Short Blessed Test (SBT) (7,8 3 9,2 vs 2,4 3 3,4 points; $p<0.05$). Burst-suppression at pEEG longer than 4 minutes was significantly higher in PODg. At day-5 a worst SBT was found in PODg. PODg have shown a higher incidence of major post-operatory complications versus NPODg (50% vs 7.5%; $p<0.05$).

Conclusions: The observed incidence of POD in our patients was lower than expected. The patient's individual predisposition and frailty, mostly nonmodifiable preoperative risk factors, significantly affect the development of POD. In patients developing POD a worsening of performance in postoperative SBT compared to the preoperative one, a delayed mobilization, and a higher incidence of complications were observed.

PO 59 - ID 324

THE IMPLEMENTATION OF A "PREVENTION, EVALUATION, AND MANAGEMENT" WORKPLAN FOR DELIRIUM IN A MAJOR HOSPITAL IN NORTHERN ITALY

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Rossi Camillo, Direzione Sanitaria, ASST Spedali Civili – Brescia; Italy
[3] Latronico Nicola, Dipartimento di Specialità Medico-Chirurgiche, Scienze Radiologiche e Sanità Pubblica, Università degli Studi di Brescia – Brescia; Italy
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Background/Aims: Delirium is a frequent condition in hospitalized older person, strongly associated with several poor health-related outcomes. Delirium can be potentially prevented and treated, but it is often under-recognized in clinical practice.
We describe the implementation in a major hospital in Northern Italy (ASST Spedali Civili – Brescia) of a workplan aimed to standardize the prevention, the evaluation, and the management of delirium.
Materials and Methods: A group of physicians with different backgrounds reviewed the scientific literature and developed a workplan, standardizing the procedures related to delirium prevention, diagnosis, and management. A group of 3 persons (a physician, a nurse, and an auxiliary staff member) from every hospital ward participated to training seminars.
Results: The document presents a definition of delirium and briefly summarizes its epidemiological and pathophysiological characteristics. The workplan standardizes the procedures to identify older persons at increased risk of delirium in the Emergency Room (ER), in the Intensive Care Units (ICUs), and in ordinary wards. Interventions to reduce the risk of delirium development are listed in the document. For delirium screening, the 4-AT was chosen for implementation in the ER and in ordinary wards, whereas the CAM-ICU was implemented in the ICUs. The workplan guides hospital staff throughout the evaluation of potential causes of delirium in case of delirium diagnosis. Non-pharmacological and pharmacological (for well-defined cases) management of delirium is described in the document. The workplan describes possible adverse reaction to psychotropic drugs used to treat delirium, drug-to-drug interactions, and strongly recommends to deprescribe any pharmacological treatment used to treat delirium, after its resolution.
Conclusions: The presentation of the workplan was well received by hospital staff during the training seminars. Future studies should evaluate benefits and pitfalls of the implementation of this workplan.

PO 60 - ID 361

RECOMMENDATIONS FOR THE MANAGEMENT OF DELIRIUM IN THE HOSPITALIZED NEUROLOGIC PATIENT

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Background/Aims: Delirium is a clinical condition characterized by an altered state of consciousness with acute onset, fluctuating course, and transient duration with alterations in the ability to receive, process, store and remember information. In the neurological setting, the most frequent causes of delirium onset are cerebrovascular disease, traumatic brain injury, brain infection and inflammation, nonconvulsive status epilepticus, and migraine headaches. The occurrence of delirium during hospitalization increases patient mortality, and complication rates and the length of hospitalization.
Materials and Methods: We analyzed recent psychopharmacological guidelines and decision-making algorithms used in neurological emergency care to plan a treatment approach to delirium that reflects current evidence regarding treatments.
Results: The first approach to delirium in the hospitalized neurological patient is its prevention through the identification and correction of risk factors, adequate hydration and nutrition, treatment of pain, maintenance of adequate oxygenation, regularization of bowel habits and urination, early mobilization, prevention of infection, facilitation of proper sleep-wake rhythm, and control of environmental stimuli to promote spatio-temporal orientation. Pharmacological management requires specific precautions: withdrawal of unnecessary medications, careful drug dose titration, use of small doses at regular intervals, and re-evaluation of therapy at least every 24 hours. Antipsychotics are used as first-line drugs; however, pharmacological treatment should be limited to the management of symptoms that impose a risk to the safety of the patient or caregivers (agitation and aggression) or that are highly stressful for the patient (hallucinations). The antipsychotic of first choice is Haloperidol (up to 3 mg/day); in case of contraindications or side effects, Risperidone, Quetiapine, and Olanzapine are the recommended therapeutic alternatives. In all these cases, QTc monitoring and a dosage reduction in the elderly and in cases of prolonged QTc are important.

Conclusions: The first therapeutic approach to delirium in the neurological patient is the prevention of its occurrence by identifying and correcting possible risk factors; in those cases where psychopharmacological treatment is necessary, the use of antipsychotics is recommended.

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PO 61 – ID 366

ASSESSING RECOVERY FROM DELIRIUM: A SYSTEMATIC REVIEW OF STUDIES REPORTING THE UTILITY OF COGNITION AND OTHER NEUROPSYCHOLOGICAL DOMAINS IN ACUTE HOSPITAL PATIENTS

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Background: A key aspect of delirium care involves tracking for recovery. There is uncertainty over how recovery from delirium should be assessed with considerable variability in practice. We reviewed studies evaluating tests of cognition and other neuropsychological domains in tracking recovery from delirium in acute hospital settings.

Materials and Methods: We conducted a systematic review of the available literature on tracking change in specific domains of delirium using assessment tools on repeat occasions. We searched 6 databases (MEDLINE, CINAHL etc.), from inception to October 26th 2021. References of included studies were also screened. Inclusion criteria: studies focusing on adult patients (≥18 years) in acute hospital diagnosed with delirium by the DSM, ICD criteria or a validated delirium tool; at least 1 repeat assessment using a neuropsychological assessment tool measuring specific domains of delirium or measuring functional recovery, within 7 days from the baseline assessment.

Results: We included 39 papers (reporting 33 studies), with a total of 3,434 participants (2,370 participants with delirium). There was an average of 4 repeat assessments including baseline (range 2-10 assessments), measuring a total of 16 specific domains. The three most common domains assessed were general cognition (21/33 studies), arousal (10/33 studies) and attention (9/33 studies). Twelve studies did not report within-person change in scores over time.

Conclusions: The methodological heterogeneity of the results was too high to draw firm conclusions on the effectiveness of assessment tools to measure delirium recovery. Included studies generally did not focus on assessing recovery and there was no standard approach for tracking change in specific domains of delirium. This gap in the field highlights the need for a standardised method of assessing change in specific domains of delirium over time.

PO 62 – ID 371

AESTHETIC WAYS OF KNOWING TO SUPPORT USE OF TOOLS IN DELIRIUM SUPERIMPOSED ON DEMENTIA

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Background/Aims: In the United Kingdom (UK), individuals who have delirium superimposed on dementia (DSD) may be cared for by mental health nurses. The UK single field training and registration of nurses may present challenges when navigating the complex interface between physical, mental, and cognitive care in DSD.

The study aimed to 1) illuminate the experiences, views, and perceptions of mental health nurses caring for people with DSD, 2) identify and describe influencing and impacting factors within the workplace, and 3) generate new understanding of DSD care provision.

This paper reports one key finding relating to an aesthetic way of knowing individuals, and how this influences the use and usefulness of assessment tools in DSD.

Materials and Methods: Activity Theory was used to support a mixed methods exploratory sequential study. A sample of mental health nurses undertook 1:1 semi structured interviews to build a qualitative understanding of their experience, which subsequently informed a new questionnaire. This was distributed to a wider sample before integration of data was undertaken. Framework analysis and descriptive statistics were used to analyse the data sets.

Results: This paper focuses on one key finding. The mental health nurses retained aesthetic ways of knowing a person and use this to guide their care provision. They were aware of, and did use DSD tools, but 73.9% of the nurses surveyed thought that the clinical team's knowledge of a person was more important than a score, or written guidance.

Conclusions: UK Mental health nurses occupy a unique

position in practice; one in which the aesthetic knowing of a person is central and informs their use of scoring tools. The aesthetic way of knowing should be recognised to support DSD care provision.

PO 63 – ID 371

OCCUPATIONAL THERAPY TO IMPROVE THE QUALITY OF LIFE OF PEOPLE WITH DELIRIUM ADMITTED TO AN INTENSIVE CARE UNIT

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Background/Objectives: The number of annual ICU admissions due to critical illness are rapidly increasing in western medicine. Associated with the intensive care environment, the critical illness can induce the brain to react in the form of neuropsychiatric symptoms and disorders including delirium, which can have an incidence of 87%. This has negative implications on the person's cognitive status and quality of life and on his/her caregivers'. Despite this, the syndrome remains underestimated and understudied, presenting typically 50% of cases lost. In addition, there is no single intervention or medication to treat delirium, making it difficult to manage it. The aim of this review is to detect the effectiveness of early occupational therapy care for delirium patients in intensive care unit.

Materials and Methods: The research methodology used is literature review, which has been conducted on the PubMed database. Several MASH terms, concerning delirium, occupational therapy, and long-term outcomes, were used to form a search string. This string yielded a total of 118 publications. Articles involving pediatric patients or intervention in non-acute settings were excluded, resulting in a total of seven articles eligible for this review.

Results: The results suggest that occupational therapy's interventions have positive effects in preventing delirium in the selected/this population. Among these interventions, the most widely used is cognitive stimulation, which is offered while performing activities of daily living. Currently, there is no evidence of improved long-term outcomes.

Conclusions: Current evidence reports positive results regarding feasibility and implementation of early occupational therapy in the ICU for patients with delirium. It is necessary to conduct more studies with larger samples in order to detect the effectiveness of the interventions and to be able to generalize their effect. Evidence and guidelines suggest that good outcomes require implementation of interdisciplinary care combined with sedation limitation and early mobilization.

PO 64 - ID 373

DELIRIUM IN HIP FRACTURE PATIENTS IS ASSOCIATED WITH HIGHER MORTALITY, LONGER LENGTH OF STAY, AND INCREASED LEVEL OF CARE ON DISCHARGE

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Background: Delirium is highly prevalent in hip fracture patients admitted to hospital. This study examined the associations between delirium and outcomes including mortality, length of stay, discharge level of care and readmission.

Methods: In this retrospective cohort study, clinical auditors collected routine healthcare data for all patients aged ≥50 years who presented with a hip fracture to a high-volume Orthopaedic centre between March 2020-November 2021. Data were independently validated. Variables included: demographics, delirium status, COVID-19 status, treatment factors, and outcomes (30- and 180-day mortality, length of stay, discharge destination and readmission). Delirium status was ascertained from contemporaneous 4AT scores recorded by clinicians in the Emergency Department or on ward. Analysis used Wilcoxon rank sum or Chi-square tests for baseline differences, Cox proportional hazard regression for mortality, logistic regression for discharge level of care and readmission and linear regression for length of stay. Analyses were adjusted for age, sex, deprivation, pre-fracture residence and COVID-19 status.

Results: Of 1822 patients (mean age 81 years, 72% female) admitted, 496/1822 (27.2%) had delirium (4AT score >=4). Of the 371/1822 (20.4%) patients that died within 180 days, 177/371 (47.7%) had delirium during the acute hospital stay. Delirium was independently associated with an increased risk of mortality at 30- and 180-days (adj.HR 1.74 (95%CI 1.15-2.64; p=0.009 and 1.74 (1.36-2.22; p<0.001), respectively), increased length of stay (adj. B-coef 2.90 (se 0.77); p<0.001) and increased risk of discharge to a higher level of care (OR 3.01 (95%CI 2.24-4.06; p<0.001)).

Conclusions: More than one-quarter of hip fracture patients had a 4AT score suggestive of delirium, and this was independently associated with increased mortality, longer length of stay, and higher level of care on discharge. These findings emphasise the importance of effective delirium screening and evidence-based interventions in this vulnerable population and are relevant for clinical prognostication and service-planning.

	Delirium (n= 496)	No delirium (n= 1326)	P-value*
AGE (years) (mean (sd))	84.55 (7.96)	79.29 (10.41)	p<0.001
SEX (female (%))	348 (70.2)	958 (72.2)	p = 0.38
SCOTTISH INDEX OF MULTIPLE DEPRIVATION (decile (%))			
1 (most deprived)			
2	16 (3.2)	57 (4.3)	
3	33 (6.7)	111 (8.4)	
4	78 (15.7)	155 (11.7)	
5	38 (7.7)	136 (10.3)	p=0.09
6	37 (7.5)	95 (7.2)	
7	33 (6.7)	116 (8.7)	
8	41 (8.3)	83 (6.3)	
9	50 (10.1)	137 (10.3)	
10 (least deprived)	62 (12.5)	140 (10.6)	
	108 (21.8)	290 (21.9)	
PRE-FRACTURE RESIDENCE (%)			
Acute hospital	56 (11.3)	51 (3.8)	
Care home	219 (44.2)	74 (5.6)	p<0.001
Home	200 (40.3)	1180 (89.0)	
Rehab	15 (3.0)	17 (1.3)	
Other	6 (1.2)	4 (0.3)	
COVID-19 STATUS			
Positive (%)	45 (9.1)	76 (5.7)	p=0.015
Outcome variables			
MORTALITY (%):			
Deceased at 30 days	68 (13.7)	63 (4.8)	p<0.001
Deceased at 180 days	177 (35.7)	194 (14.6)	p<0.001
LENGTH OF STAY (days) (median (IQR))			
Acute LOS	11 [7-18]	11 [7-16]	p<0.001
Total LOS	17 [8-46.5]	14 [8-33]	p<0.001
DISCHARGE DESTINATION (%)			
Acute hospital	26 (5.2)	49 (3.7)	
Care home	202 (40.7)	75 (5.7)	
Home	62 (12.5)	767 (57.8)	p<0.001
Rehab	116 (23.4)	311 (23.5)	
Deceased	49 (9.9)	48 (3.6)	
Other	41 (8.3)	76 (5.7)	
READMISSION (%)			
<30days	73 (14.7)	239 (18.0)	p=0.12
<180 days	133 (26.8)	489 (36.9)	p<0.001

*Wilcoxon rank sum test for continuous (non-parametric) variable; chi-square test for categorical variables

PO 64 *Table 1. Patient demographics, type of residence and COVID-19 status, and outcome variables mortality, length of stay, discharge destination and readmission, according to delirium status. Delirium assessed as 4AT>=4 at or during acute hospital admission.*

PO 65 – ID 380

A CLOSED AUDIT LOOP ON IMPROVING ADHERENCE OF DELIRIUM SCREENING AND IMPLEMENTATION OF SINGLE QUESTION OF DELIRIUM AS A SCREENING TOOL

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Introduction: Delirium affects up to 50% of the elderly who are admitted to in-patient facilities. Delirium is preventable in 30-40% of geriatric in-patients. Trust guidance recommends an initial screening for all admissions >65, followed by continuous monitoring. This initial screening is documented using the 4AT delirium assessment tool and documented as a proforma.

''Do you think the patient is more confused than before ?'' is the single question in delirium (SQiD) rated positive or negative by clinical staff on reviews. Concept of SQiD is to facilitate a quicker and easy to use approach to screening delirium prior to longer delirium assessment for confirmation as appropriate. This project aims to improve the adherence to delirium screening in accordance with local trust guidelines in a geriatric ward in a tertiary hospital and record efficacy of implementation of SQiD.

Method: Baseline audit was conducted retrospectively from April to May to assess the adherence to trust guidelines. An educational poster to introduce SQiD and encourage filling of proformas. In addition, brochures and face to face interviews were conducted with the nurses to promote the usage of SQiD.

The SQiD question was incorporated into the nursing care rounds and usage recorded from June through July. The percentage of adherence to guidelines was prospectively analysed.

Results: Retrospectively, 9% of ward admissions had adhered to trust guidelines from months April to May. The introduction of SQiD had significantly increased filling of proformas to 88% from June through July. Number of SQiD documented increased from 0% to 89% into introducing the brochures and face to face interviews.

Conclusions: Although this small scale project could be viewed as a success, the requirements for sustainability depend upon addressing limitations for completion of proformas and ongoing training. The SQiD is not intended to replace tools such as CAM but seems to improve functionality and adherence in a routinely reviewed in-patient setting.

There will always be a trade-off between comprehensiveness and practicality with any screening test. Given SQiD's ease of use and time efficiency, it serves good promise to improve recognition.

PO 66 – ID 339

PREOPERATIVE LEVELS OF CSF NEUROFILAMENT LIGHT (NFL) ARE ASSOCIATED WITH POSTOPERATIVE DELIRIUM IN OLDER ADULTS WITHOUT DEMENTIA UNDERGOING HIP FRACTURE REPAIR

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Background: Delirium commonly occurs in older adults following surgery. Although the pathophysiology of delirium is not fully understood, it is thought to be associated with neuronal damage. The aim of this study was to examine the association of preoperative levels of two markers of neuronal damage, NfL and phosphorylated tau (p-tau181), in plasma or CSF with incidence of postoperative delirium.
Materials and Methods: Preoperative CSF and plasma were obtained from 157 hip fracture patients enrolled in the randomized clinical trial "A Strategy to Reduce the Incidence of Postoperative Delirium in Elderly Patients." Inclusion criteria included age ≥65 and Mini-Mental State Exam (MMSE) score ≥15. Samples were analyzed for NfL and p-tau181 using Quanterix *SIMOA®* Assay and values were log transformed. Delirium status and Clinical Dementia Rating (CDR) were adjudicated by a consensus diagnostic panel. Stata version 15 was used for statistical analysis.
Results: The incidence of delirium in this cohort was 37.6%, and 85.3% were without dementia (defined as CDR 0 or 0.5), mean age 82 years, 73.2% female, 96.8% white, mean MMSE 24.1. At baseline, those who experienced delirium compared to those who did not were significantly older, and had lower MMSE, higher CDR, and higher Geriatric Depression Scale (GDS) scores. Plasma and CSF NfL and p-tau181 levels were not significantly associated with delirium. In subgroup analyses of patients without dementia the delirium incidence was 31.1% and preoperative CSF NfL was strongly associated with delirium [OR 4.9 (95% CI 1.2-20.5), p = 0.03] in multivariate analysis adjusted for age, MMSE, CDR and GDS.
Conclusions: CSF NfL levels were significantly associated with delirium incidence in patients without dementia, an important population in whom biomarkers would be most useful. Results confirm prior studies suggesting NfL may be a biomarker of delirium risk and support an association between axonal injury and delirium.

PO 67 – ID 346

PHARMACOLOGICAL RECOMMENDATIONS IN THE TREATMENT OF DELIRIUM IN ONCOLOGICAL PATHOLOGY

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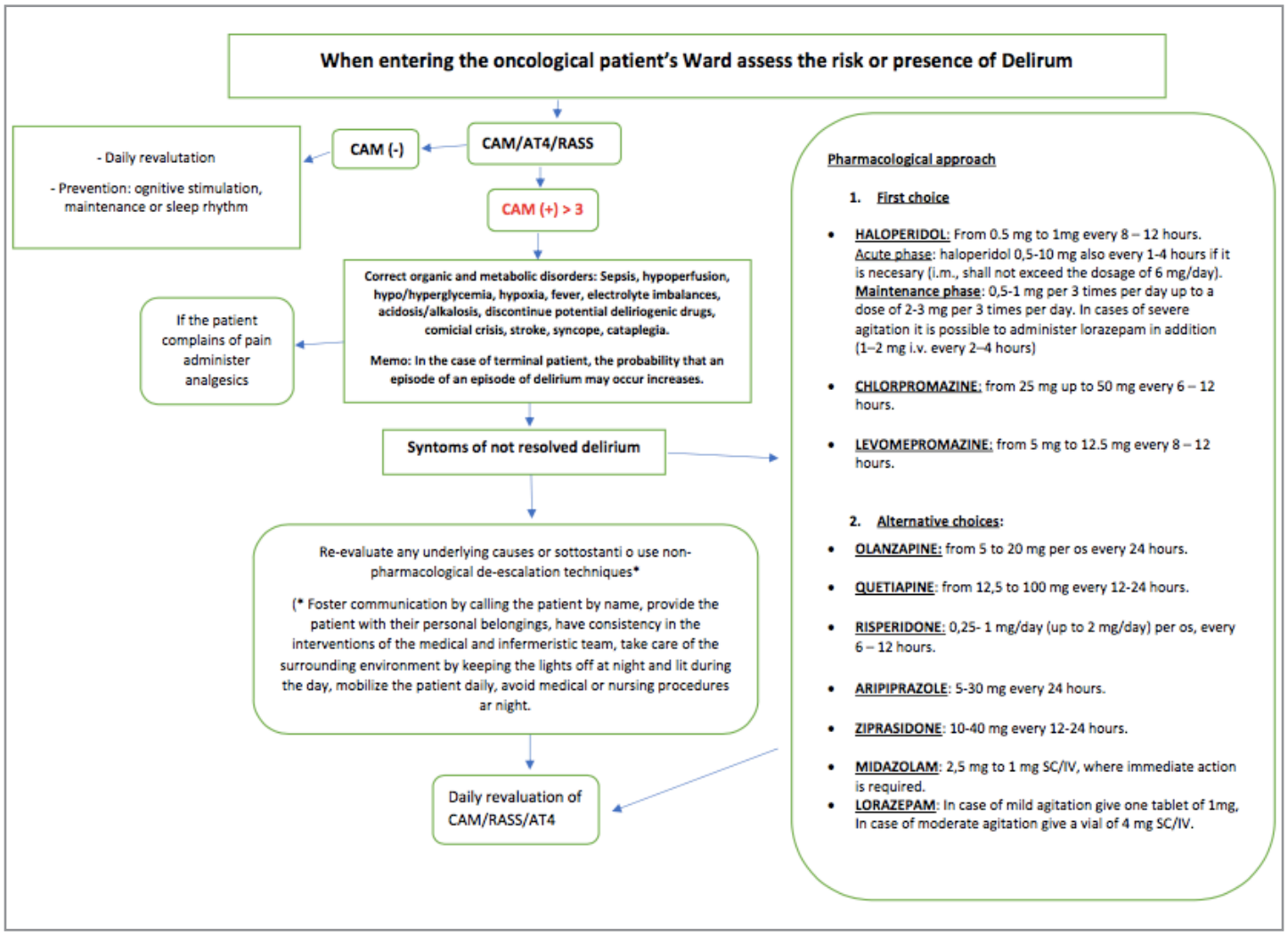
Background/Aims: In oncological patients, delirium can be determined directly by an organic cause (primary brain tumor, cerebral metastasis, skeletal metastasis, or meninges) or indirectly through the abnormal neurotransmitters, cytokines, or inflammatory mediators for the disease action affecting brain physiology. The level of vulnerability to delirium in oncological patients increases as the oncological disease progresses. The onset of delirium in palliative care increases di risk of short-term mortality, for which the search for possible reversible causes and their treatment is fundamental in the first place. The percentage of oncological patients presenting this condition is 20% to 86%.
Materials and Methods: We analyzed recent psychopharmacological guidelines and decision-making algorithms used in oncological care to plan a treatment approach to delirium that reflects current evidence regarding treatments.
Results: Hyperactive delirium and hypoactive delirium in terminal oncological patient management it is confirmed to be of extreme importance due to the large number of cases that are increasing in hospitals. It is essential to know the nature of the pathology that produces delirium to proceed with appropriate treatment.
Conclusions: Haloperidol (up to 6 mg/day) is the first-choice treatment, followed by chlorpromazine (up to 100 mg/day) and Levomepromazine (up to 25 mg/day). It is advisable to monitor the QTc interval due to the high risk of collateral effects such as extrapyramidal symptoms, dyskinesia, or neuroleptic malignant syndrome. Atypical antipsychotics (olanzapine and quetiapine) and benzodiazepines (orazepam and midazolam) represent alternative treatment choices.



PO 67 *Figure 1.*

PO 68 – ID 403

DELIRIUM AS PHENOTYPE OF PRODROMAL DEMENTIA WITH LEWY BODIES: A CASE REPORT

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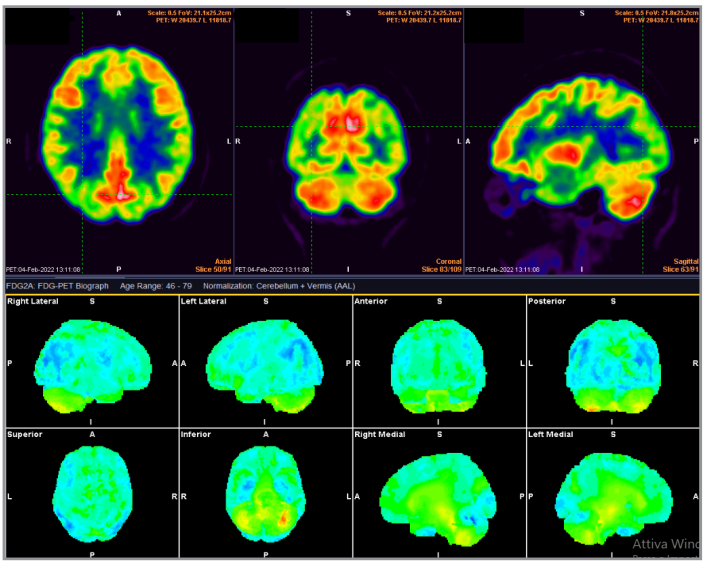
Background: Dementia with Lewy bodiees (DLB) is a disease characterized by deposits (Lewy bodies) of alpha-synuclein and is the second most common type of neurodegenerative dementia after Alzheimer's disease. DLB is characterized by fluctuation of attention, extrapyramidal signs, visual hallucination and RBD. Acute confusional state (or delirium) may represent one of the manifestations of the disease in the prodromal stage along with mild cognitive impairment and psychiatric symptoms.

Case presentation: We report on a 69 year-old woman with brief episodes of disorientation, difficulty concentrating occurring from April 2021. In December 2021 an episode of acute confusional state with speech impairment occurred; the patient underwent brain MRI, EEG and carotid ultrasound imaging, which were negative. She was hospitalized in January 2022 after a second episode of delirium. Personal history was positive for restless leg syndrome, RBD-like symptoms and depressive symptoms. Neurological examination was unremarkable, apart from slight increased muscle tone. The neuropsychological evaluation showed impairment in executive functions, language and praxia (MMSE 24/30). Blood investigations and CSF analysis were normal, including levels of beta-amyloid, total tau and phosphor tau. EEG showed frontotemporal and central sharp waves in the acute phase, which improved in the following control. Brain FDG-PET/MRI showed hypometabolism of the parieto-occipital cortex bilaterally with cingulate island sign. Also, during the hospitalization a diagnosis of restless legs syndrome was made.

Conclusions: A diagnosis of delirium in minor neurocognitive disorder with attentional-visuospatial deficits and probable RBD allowed the diagnosis of prodromal DLB.



***PO 68** Figure 1.*

PO 69 - ID 414

ATYPICAL PRESENTATION OF PILL ASPIRATION IN OLDER ADULTS WITH DYSPHAGIA: A PICTURE NOT TO BE FORGOTTEN

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Nonconventional clinical presentations of diseases are common in older adults. Even dramatic events, such as foreign body (FB) inhalation, can occur in a subtle and non-specific manner. Pill aspiration is a rare yet overlooked cause of airway injury. It accounts for approximately 7% of all FB aspirations. In contrast, oral dysphagia and polypharmacology, mainly administrated in solid oral dosage forms (SDOF), like tablets and pills, are common conditions in older adults. Herein, we present a case of SDOF aspiration in a 78-year-old man. FB inhalation developed with general clinical deterioration and neurological impairment (delirium) rather than overt respiratory symptoms. Bronchoscopy provided remarkable images of this unexpected finding. Caregivers and healthcare workers must be aware of the risk of SDOF aspiration and adopt proper safety measures. Early recognition and bronchoscopy for diagnostic and therapeutic purposes can be life- saving in such cases.

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PO 70 - ID 385

IDENTIFICATION OF DATA-DRIVEN DELIRIUM SUBTYPES USING LATENT CLASS ANALYSIS

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Background: More than half of critically ill patients develop delirium, an acute organ dysfunction associated with poor short- and long-term outcomes. Clinical trials have yet to identify effective treatments for delirium, likely due to lack of clear mechanistic targets and patient heterogeneity. As a first step to understanding mechanisms of delirium and developing targeted treatments, we sought to identify data-driven delirium subtypes in patients with acute respiratory failure and/or shock.

Materials and Methods: We conducted a secondary analysis of the BRAIN-ICU prospective cohort study, which included adults admitted to a medical or surgical ICU with respiratory failure and/or cardiogenic or septic shock. We used latent class analysis to identify delirium subtypes, using demographic, clinical, and treatment data collected in the 24 hours before delirium identification in the model and examining global and local fit statistics for model selection. Then, we compared demographics, clinical characteristics, and outcomes between classes using Kruskal Wallis H tests and chi-square tests of independence.

Results: 731 patients enrolled in the BRAIN-ICU cohort study developed delirium during the study period and were included in the latent class analysis. We identified a five-class model using the Bayesian Information Criterion (Table 1). The subtypes differed in clinical characteristics and average daily sedative doses received prior to delirium identification. Class 3—a subtype with patients who received more sedation, more often had sepsis, and were younger than patients in other classes—had fewer days free of delirium and/or coma than all other classes ($p < .0001$).

Conclusions: Delirium subtypes exhibit differences in hospital outcomes. These previously unidentified, data-driven subtypes should be validated in independent cohorts and examined as potential markers of heterogeneity of treatment effect in analyses of interventional delirium trial data. Additional investigation of biomarkers and clinical trajectories of delirium subtypes are necessary to further understand potential mechanisms and therapeutic targets for delirium.

Table 1. Demographic, Clinical Characteristic, or Outcome	Class 1 n = 257 (35.2)	Class 2 n = 206 (28.2)	Class 3 n = 97 (13.3)	Class 4 n = 93 (12.7)	Class 5 n = 78 (10.8)	p-value
Age (years)	66.9 (57.9, 74.7)	63.9 (54.6, 73.5)	55.8 (44.5, 64)	61.8 (47.7, 70.3)	63.6 (56.6, 71.8)	<.0001
Charlson Comorbidity Score	2 (1, 4)	2 (1, 4)	2 (0, 3)	2 (1, 4)	3 (2, 5)	<.0001
Characteristics at delirium identification (Up to 24 hours prior)						
RASS, lowest	-2 (-3, -1)	-2.5 (-3, -2)	-3 (-4, -3)	-3 (-4, -2)	-2.5 (-3, -1)	<.0001
Number of 15-minute intervals where MAP < 65	0 (0, 4)	7 (1, 18)	3 (0, 13)	4 (0, 12)	15 (2, 41)	<.0001
Cardiovascular SOFA	2 (1, 2)	2 (2, 4)	2 (2, 3)	2 (2, 3)	4 (2, 4)	<.0001
Number of 15-minute intervals where SpO2 < 90	0 (0, 1)	0 (0, 2)	0 (0, 1)	0 (0, 1)	0 (0, 1)	0.04
SpO2-FiO2 ratio, lowest	215 (166.7, 238)	182 (148, 235)	223 (147, 237.5)	233 (166.7, 243)	211.5 (155, 240)	<.0001
Bilirubin, highest	0.8 (0.6, 2.1)	0.9 (0.6, 1.5)	3 (1, 9.3)	0.8 (0.5, 1.6)	2.1 (0.9, 4.8)	<.0001
Creatinine, highest	1.1 (0.8, 1.7)	1.3 (0.9, 2.4)	1 (0.8, 1.7)	1.2 (0.8, 2.1)	2.9 (1.4, 3.6)	<.0001
INR, highest	1.3 (1.1, 1.5)	1.4 (1.2, 1.6)	1.4 (1.2, 1.7)	1.3 (1.17, 1.5)	2.5 (1.7, 3.9)	<.0001
Lactate, highest	1.1 (0.9, 2)	1.4 (0.9, 2.4)	1.8 (0.9, 4.4)	1.4 (0.9, 2.4)	2.5 (1.1, 6)	<.0001
Troponin, highest	0.1 (0, 0.6)	0.1 (0, 0.8)	0.7 (0.1, 30.8)	5.6 (0.1, 50)	2.2 (0.1, 26.9)	<.0001
Benzodiazepines, average daily dose (midazolam equivalents)	0 (0, 2.5)	18.8 (1, 46.5)	42.5 (0.8, 89.3)	0.4 (0, 17.5)	0 (0, 4.5)	<.0001
Dexmedetomidine, average daily dose	0 (0, 0)	0 (0, 0)	0 (0, 0)	0 (0, 704)	0 (0, 0)	<.0001
Opioids, average daily dose (fentanyl equivalents)	186.7 (0, 1062.5)	1083.8 (250, 2500)	2400 (1068.8, 4800)	550 (80, 1500)	77.5 (0, 460)	<.0001
Propofol, average daily dose	735 (0, 2600)	0 (0, 0)	37.7 (0, 1640.8)	122 (0, 2000)	0 (0, 1185.3)	<.0001
Cumulative days of sepsis prior to delirium identification	2 (0, 4)	2 (0, 4)	4 (2, 10)	2 (0, 4)	2 (0, 4)	<.0001
Coma-free days	29 (27, 30)	29 (26, 30)	24 (18, 28)	29 (26, 30)	28 (8, 29)	<.0001
Delirium/coma-free days	25 (19, 28)	23 (11, 27)	18 (6, 24)	24 (14, 27)	17 (2, 26)	<.0001
30-day mortality	67 (26.0)	52 (25.2)	22 (22.7)	27 (29.0)	23 (29.5)	0.82

RASS, Richmond Agitation Sedation Scale score; MAP, mean arterial pressure; SOFA, Sequential Organ Failure Assessment score; SpO2, oxygen saturation; FiO2, fraction of inspired oxygen; INR, International Normalized Ratio

Data are presented as median (25^{th}, 75^{th} percentile) or frequency (percent)

PO 70 *Table 1.*

ABS 01 – ID 386

A QUALITY IMPROVEMENT PROJECT FOR DELIRIUM PREVENTION AND MANAGEMENT IN THE INTENSIVE CARE UNIT (ICU) OF UNIVERSITY HOSPITAL WATERFORD IN IRELAND

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Introduction: Delirium is a common complication of critical illness. Its diagnosis can have a significant impact on patients' morbidity and mortality. This audit was conducted in a 10-bedded ICU at University Hospital Waterford, Ireland. We wanted to ascertain a baseline analysis of our delirium: prevention, assessment, diagnosis and management and to confirm our compliance with the National Institute for Health and Care Excellence (NICE) guidelines. The results of this audit aim to guide the writing of local guidelines and staff training.

Methods: The data collection checklist was designed to include the five-quality standard statement according to the NICE guideline. Retrospectives review of the evaluated medical and nursing notes for 35 high-risk patients admitted to the Intensive Care Unit. The implementation of the standards was evaluated by a Likert scale (one: not implemented and documented, two: partially, and three: fully implemented and documented).

Results: Validated assessment for delirium was not done on any admitted patients. 14.3% of those patients experienced delirium. The management was almost entirely confined to drug treatment. There was inconsistency with medications used between Quetiapine, Dexmedetomidine, Lorazepam and Haloperidol. The following non-pharmacological preventive interventions were well implemented, Pain control, progressive mobility, oxygenation, nutrition & hydration. The optimization orientation & sensory stimulation and sleep promotion were not well implemented (Figure 1).

Discussion: The overall incidence of delirium ranged from 45% to 87%[3, 4]. A formal management guideline for delirium assessment and management has been developed for our institution as a result this audit. Before now there was no clear guidance on the use of anti-psychotics or escalation with treatment failure in our ICU. The non-pharmacological interventions such as adequate pain control, early mobilization and adequate oxygenation are being implemented, however optimization of orientation and sensory stimulation and sleep promotion is still required. Post the introduction of our guideline alongside a blended eLearning and face to face training approach we hope our re-audit will demonstrate benefited effect of our intervention.

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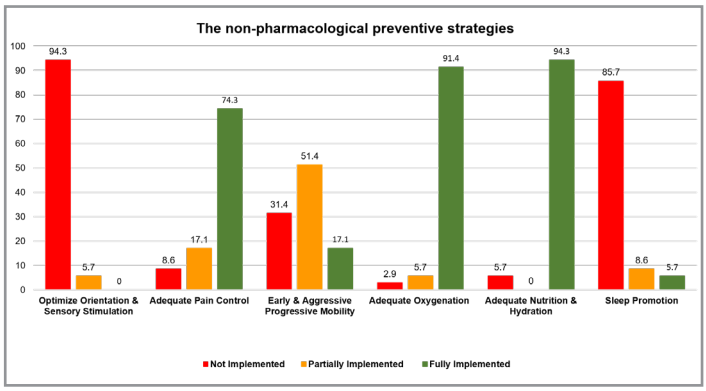

***ABS 01** Figure 1.*

ABS 02 – ID 387

EXOSOMES AS POTENTIAL BIOMARKERS OF POST OPERATIVE DELIRIUM

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Background/Aims: Post-operative delirium (POD) is a common complication of older people undergoing hip fracture surgery characterized by disruptions in cognition. Unfortunately, POD pathophysiology is still largely unknown, even if neuroinflammation and neuroendocrine dysfunction are known as major contributors. Exosomes are a class of extracellular vesicles which are released by cells and are present in biofluids. These vesicles are enriched with proteins and small RNAs, and they play a role in many physiological processes. Because exosomes can cross the blood–brain barrier, they may serve as accessible biomarkers of neural dysfunction. The role of exosomes in POD is still largely unknown in POD. The characterization of brain and endothelia derived exosome in POD patients might give insights in the pathophysiology of this condition and provide new tools for diagnosis and prognosis.

Materials and Methods: Exosomes were extracted from

plasma of patients (age >65) hospitalized for fracture of the femur. Nanoparticle tracking analysis (NTA) was used to determine exosomal size and concentration. Expression of L1CAM, CD9, CD63 and CD81was investigated by western blot in plasma exosomes.

Results: NTA showed no significant difference in exosomal size and concentration of both POD and noPOD patients before and after surgery. Interestingly, though, POD patients preoperative blood sample displayed a significant increase in the exosomal expression of L1CAM (marker of neuronal derived exosomes) compared to noPOD patients. This level is maintained also after surgery.

Conclusions: These results suggest a higher expression of neuronal derived exosomes in POD patients. With the aim of studying neuronal derived exosomes as neurodegenerative markers, but also as potential predictive factors for the delirium onset, we isolated the L1CAM positive exosomal subpopulation for further characterization and correlation with the expression of neurodegenerative markers in the cerebrospinal fluid.

ABS 03 – ID327

QUALITY IMPROVEMENT PROJECT AIMED TO RAISE EARLY DETECTION AND MANAGEMENT OF DELIRIUM AND IMPROVE COMPLIANCE OF PERSON-CENTRED CARE PLANS

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Introduction: Delirium effects over 20% of older patients within hospital and is associated with increased mortality, poorer outcomes, and longer hospital stays. 40% of delirium cases in hospital are preventable 50% of cases are misdiagnosed or not detected. In 2015 Health Improvement Scotland reported NHS Lothian must ensure that patients have a person-centred care plan in place for all identified care needs. This Quality Improvement project was carried out in the acute site of the Western General hospital where we looked at increasing compliance of person-centred care planning for patients with an altered level of cognition by raising awareness locally and nationally of detection and management of delirium.

Methods: Three Plan Do Study Act (PDSA) cycles were designed with input from Associate Nurse Director, Lead Nurse for Quality Improvement, Delirium Nurse Educator and specialist consultants in psychiatry and palliative care. The first intervention was nine weeks structured teaching sessions for all staff that focused on what delirium is, the importance of the 4AT, patient experiences and stories, delirium in palliative care, delirium and person-centred discharge planning and psychiatric medications and legal considerations. The second Intervention included developing a poster that would see collaboration with health boards throughout Scotland to raise awareness and detection. The final intervention was development of the delirium champion programme. Baseline audit data that showed percentage of person-centred care plans was collected and repeated at the end of each intervention.

Results: Baseline data showed 27% of patients with altered state of cognition had a person-centred care plan completed. Following the first intervention this increased to 38% then 55% after the second intervention. This information was collected through the electronic portal and shared site wide. The poster was used as an education resource across Scotland, England and Ireland health boards and acute hospitals.

Conclusions: Targeted education sessions and the development and displaying of a poster showed an improvement in compliance of person-centred care planning for patients with altered state of cognition. There remains room for improvement as we develop the delirium champion programme.

ABS 04 – ID 394

SCREENING FOR DELIRIUM WITH 4AT INSTRUMENT DURING COVID-19 PANDEMIC IN POLAND

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Background: Intensive Care Unit (ICU) delirium is a nonspecific, potentially preventable, and often reversible disorder of impaired cognition, which results from various causes in ICU patients. For appropriate management of delirium, early identification and risk factor assessment are key factors.

Aim: The present study was aimed to assess a group of patients infected with SARS-CoV-2 for the presence of delirium, with the use of 4AT instrument. Delirium is a phenomenon which affects patients with various disorders and representing various age groups. Screening instruments make it possible to diagnose the condition at an early stage and to prevent its development.

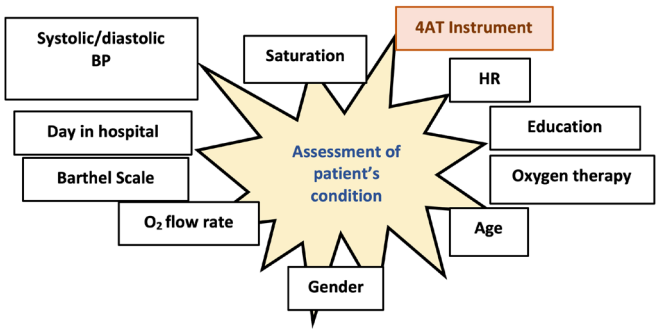
Materials and Methods: The article presents application of the 4AT instrument, i.e., a two-minute test used to identify signs of delirium in patients infected with SARS-CoV-2. The 4AT test was used to assess 112 patients with SARS-CoV-2. The patients were selected at random

Results: The patients' mean age was 56.4313.42 years. Blood oxygen saturation in the consecutive assessments was improved significantly ($p<0.000001$). Systolic BP was significantly higher in Assessment 1, compared to Assessments 2 and 3 ($p<0.000001$). Diastolic BP

Hypertension				
Assessment 1	no	%	yes	%
possible cognitive impairment	19	30.16%	13	26.53%
possible delirium +/- cognitive impairment	44	69.84%	36	73.47%
Assessment 2	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	16	25.40%	8	16.33%
possible cognitive impairment	3	4.76%	5	10.20%
possible delirium +/- cognitive impairment	44	69.84%	36	73.47%
Assessment 3	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	43	68.25%	37	75.51%
possible cognitive impairment	2	3.17%	4	8.16%
possible delirium +/- cognitive impairment	18	28.57%	8	16.33%
Diabetes				
Assessment 1	no	%	yes	%
possible cognitive impairment	8	16.67%	24	37.50%
possible delirium +/- cognitive impairment	40	83.33%	40	62.50%
Assessment 2	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	6	12.50%	18	28.13%
possible cognitive impairment	2	4.17%	6	9.38%
possible delirium +/- cognitive impairment	40	83.33%	40	62.50%
Assessment 3	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	35	72.92%	45	70.31%
possible cognitive impairment	1	2.08%	5	7.81%
possible delirium +/- cognitive impairment	12	25.00%	14	21.88%
Pneumonia				
Assessment 1	no	%	yes	%
possible cognitive impairment	29	29.90%	3	20.00%
possible delirium +/- cognitive impairment	68	70.10%	12	80.00%
Assessment 2	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	22	22.68%	2	13.33%
possible cognitive impairment	7	7.22%	1	6.67%
possible delirium +/- cognitive impairment	68	70.10%	12	80.00%
Assessment 3	no	%	yes	%
delirium or severe cognitive impairment unlikely (but delirium is still possible)	69	71.13%	11	73.33%
possible cognitive impairment	6	6.19%	0	0.00%
possible delirium +/- cognitive impairment	22	22.68%	4	26.67%

Blood oxygen levels during hospitalisation

***ABS 04** Table 1.*



***ABS 04** Figure 1.*

was significantly higher in Assessment 1, compared to Assessments 2 and 3 ($p<0.000001$).

Conclusions: The 4AT is a tool presenting high diagnostic accuracy. Moreover, the 4AT can be performed rapidly, contributing to early recognition of delirium. Higher age corresponds to higher 4AT score, which is important for the survival of elderly individuals as well as for the correct address of the impact that delirium has on frailty management.

ABS 05 – ID 406

EXAMINING THE METABOLITE RELATIONSHIPS ACROSS BLOOD-BRAIN BARRIER (BBB) AND THEIR ASSOCIATIONS WITH POST-OPERATIVE DELIRIUM

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Background/Aims: Reduced blood-brain barrier (BBB) function has recently been reported in patients displaying

postoperative delirium. Several studies have also found changes in either cerebrospinal fluid (CSF) or blood metabolites in cases of delirium. This investigation examined whether metabolite relationships across the BBB are linked to delirium.

Materials and Methods: CSF/plasma albumin ratio (Qalb) compares the levels of albumin in the CSF and the plasma, and is used as a measure of BBB integrity. Pre-operative CSF and plasma from participants matched for age, gender, and ApoE underwent metabolomic profiling. For each measurable metabolite, a CSF/plasma metabolite ratio (Qmetab) was obtained. Using Qalb as a surrogate for BBB function we determined the association between Qmetabs in all participants, and those who experienced delirium and those who did not.

Results: Many phosphatidylcholine (PC) ratios (Qmetab) were found to significantly correlate with Qalb, but in almost all cases the associations only existed in individuals who subsequently experienced a delirium. The underlying reason for this is unclear, but it possibly indicates a shift in PC balances in those prone to delirium.

Conclusions: the equilibrium of certain species of phosphatidylcholine across the BBB does not accord with BBB function. Understanding the reasons for this observation could improve our understanding of the mechanisms underlying delirium.

ABS 06 – ID 313

DELIRIUM IN PATIENTS HOSPITALIZED FOR COVID-19: A CASE SERIES FROM "G. MARTINO" HOSPITAL IN MESSINA

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Background: Delirium is commonly associated with long-term hospitalization as well as many infectious diseases. SARS-CoV-2 pandemic did make no exception, considering the sudden need of hospital beds, the long hospital stay and the need for O2-therapy, which may also trigger delirium episodes1.

Materials and Methods: From 2020 to May 2022, we had 8 cases of delirium among the COVID-19 patients hospitalized at the Infectious Diseases Unit, in "G. Martino" Hospital in Messina. We analyzed the days of hospitalization, comorbidities, vaccination for SARS-CoV-2, the need for O2, eventual COVID-19 treatments, symptoms of delirium, drugs practiced and the outcome.

Results: We had 8 patients with delirium, 7 of them male, with a median age of 6436 years old. Most common comorbidities were type II diabetes and history of cardiovascular diseases. 6 patients were not vaccinated for SARS-CoV-2, while the others had at least 2 shots of the vaccine. Median days of hospitalization were 27.538, with the longest being 48. 7 patients out of 8 needed O2 supplementation. As COVID-19 specific therapy in one case were administered casirivimab/imdevimab and in another hydroxychloroquine. In all cases, aggressiveness towards medics and the patients themselves and reality distortion were the most prominent features of delirium, one episode of hallucination is reported. Therapies most commonly practiced were haloperidol, promazine and tiapride, with complete resolution in about 4 cases. 6 patients had a clinical recovery, just 3 had a virological one, 2 patients deceased.

Conclusions: Delirium is an important and underestimated complication of long-term hospitalization during COVID-19 pandemic. As it appears from our case series, O2 therapy, long hospitalization and male sex seem to be positively correlated with the development of delirium. Further studies are needed to evaluate the risk of delirium in COVID-19 pandemic.

References:

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ABS 07 ID 351

PREVALENCE OF MENTAL HEALTH CONDITIONS: A COMMUNITY-BASED CROSS-SECTIONAL STUDY

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Introduction: Mental health such as depression and anxiety are the most important health indicators that cause considerable morbidity in elderly people. Providing elderly mental healthcare in Elbasan city, especially during the pandemic COVID-19 time is challenging due to many reasons such as the unusual situation that this pandemic caused, also the growth of the elderly population, and limited health resources.

Objective: We examined the prevalence of depression, and anxiety, as well as the risk factors of these mental health issues among elderly over 65 years old in Elbasan city.

Methods: This is a cross-sectional study conducted on 617 persons ≥65 years old that living in Elbasan city. A google form or a face-to-face interview with a pre-tested questionnaire was carried out by all participants. General Anxiety Disorder Assessment (GAD) for anxiety assessment and Patient Health Questionnaire (PHQ-9) for depression assessment was incorporated into the questionnaire. Data were analyzed by chi-square test. All statistical analyses were done using SPSS version 20.0. P-values less than 0.05 were considered statistically significant.

Results: The prevalence of depression and anxiety in this

study resulted in 87.8% and 88% respectively. More of the patients 80.2% (495/617) had passed the COVID-19 disease. According to the severity of anxiety and depression, in most of the cases, 77.9% (325/417) resulted in mild anxiety, while 71.4% (302/417) resulted in mild depression. The highest prevalence is observed in age groups (65 to 75 years old). Women were an almost double number of cases 66% compared to males. The women were 1.8 times at risk for anxiety compared to males for 95% CI [0.45-3.42] p-value resulted =0.02 and 1.4 times in risk for occurrence of depression compared to men for CI 95% [0.39-3.12] p-value resulted=0.03. There was found a strong association between marital status, level of monthly income, comorbidities, and living conditions with anxiety and depression.

Conclusions: The findings of this study suggested a higher prevalence of anxiety and depression during the covid-19 pandemic time. Women were the most affected gender and persons between the ages of 65-75 years old. We strongly recommended raising community awareness of mental health, encouraging social participation, and supportive counselling is also essential in combating anxiety and depression among adults. Taking action to address the burden of major depressive disorder and anxiety disorders should be an immediate option for all medical staff and stakeholders.

ABS 08 – ID 343

TOWARDS AN UNDERSTANDING OF THE BIOLOGICAL MECHANISMS OF DELIRIUM USING FUNCTIONAL MRI (FMRI): PRELIMINARY RESULTS

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Background/Aims: Delirium is a common condition in older hospitalised patients causing high morbidity and mortality. The neurobiological basis for delirium is uncertain and, for numerous reasons, research in this area has been limited. Several recent studies have demonstrated that functional neuroimaging in delirium is achievable and has suggested that a brain region termed the default mode network (DMN), may play a cardinal role in delirium pathogenesis.
Study aims are:

- Demonstrate the feasibility of fMRIs in geriatric inpatients with delirium
- Demonstrate aberrant default mode network activity via fMRI in patients with delirium compared to non delirious geriatric inpatient controls

Materials and Methods: Observational pilot study obtaining a fMRI scan of inpatients in an Australian, tertiary hospital, geriatric ward. Eligible patients diagnosed as delirious by a geriatrician were compared against non-delirious controls. Informed consent was obtained. A novel scanning paradigm was developed. Sequences assed brain structure and functional networks in resting state and during a simple task of sustained attention and response inhibition.

Results: 11 participants have been scanned. 6 participants were delirious: mean age 81 years (range 77 – 85 years), 3 female. 5 participants were non-delirious: mean age 83.4years (range 79 -90 years), 2 female. 10 of the 11 participants completed the full imaging protocol, including task engagement. Head movement during scanning, was generally within acceptable limits. Data demonstrates considerable cortical atrophy and ventricular enlargement consistent with age. Preliminary fMRI analyses show a variable pattern of cortical recruitment during task engagement in delirious patients.

Conclusions: These findings show it is ethically and logistically feasible to engage elderly patients with acute delirium into a high end structural and functional imaging study.

ABS 09 ID 384

SURVIVAL OF FRAIL ELDERLY WITH DELIRIUM

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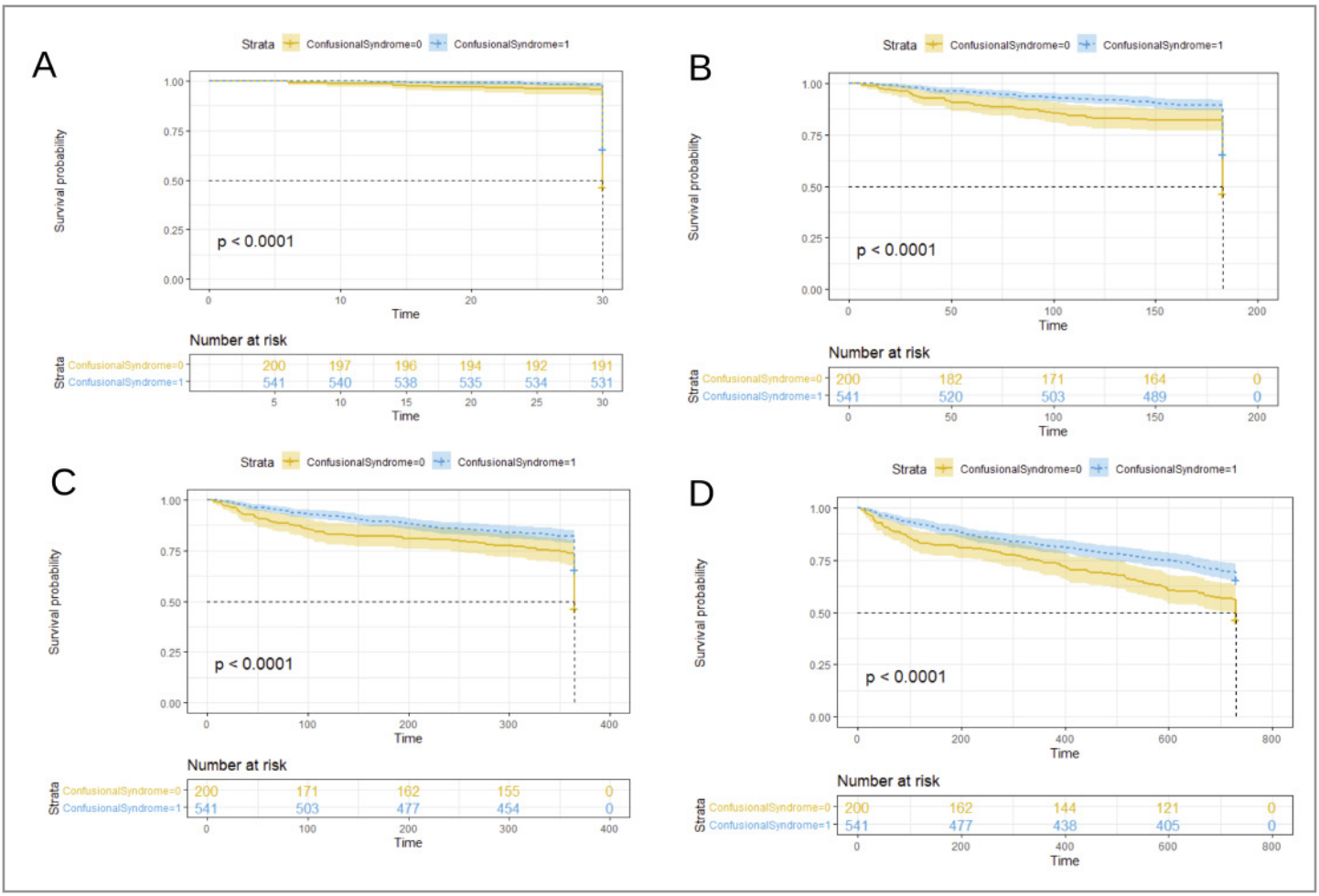
Background/Aims: Delirium is a multifactorial disorder that is highly prevalent in hospitalized elderly people that causes complications in the patient care and increases mortality at the hospital and son after discharge. This study aims to determine when frailty increases the risks of delirium mortality.

Materials and Methods: We screened for frailty, cognitive status and co-morbidities, and extracted drug information and mortality data from electronic health records. Kaplan–Meier estimates of survival probability functions were computed at four times, comparing delirium versus non delirium patients. Differences in survival were assessed by a log-rank test. Independent Cox's regression was carried out to identify significant hazard risks (HR) at 1 month, 6 months, 1 year, and 2 years.

Results: Delirium predicted mortality (log-rank test, $p < 0.0001$) at all four censoring points. For the delirium



ABS 09 *Figure 1. Kaplan-Meier survival curves for patients diagnosed with delirium at admittance or during the stay (incident cohort) versus patients without delirium diagnosis. Data were censored after 1 month in plot (A), 6 months in plot (B), 1 year in plot (C), and 2 years in plot (D). Note: In the plots, ConfusionalSyndrome = 1 for patients with no delirium diagnosis (blue curve in the plots). Time was expressed in days. The p-value shown in the plots corresponds to the log-rank test comparison of no delirium versus delirium survival probability curves.*

cohort, variables with the most significant 2-year hazard risks (HR(95%CI)) were: male gender (0.43 20 (0.26,0.69)), weight loss (0.45 (0.26,0.74)), sit and stand up test (0.67 (0.49,0.92)), readmission within 30 days of discharge (0.50 (0.30,0.80)), cerebrovascular disease (0.45 (0.27,0.76)), head trauma (0.54 22 (0.29,0.98)), number of prescribed drugs (1.10 (1.03,1.18)), and the use of diuretics (0.57 (0.34,0.96)).

Conclusions: A comparison of the survival probability curves confirmed that delirium was a factor for greater mortality at the four censoring times considered. The findings of the study, in decreasing order of hazard risk significance, were the frailty indices, polypharmacy, the use of diuretics, and some comorbidities associated with delirium onset, such as high cholesterol, cerebrovascular disease, and head trauma.

ABS 10 – ID 395

POLISH VERSION OF THE POST-TRAUMATIC STRESS DISORDER RELATED TO COVID-19 QUESTIONNAIRE COVID-19-PTSD

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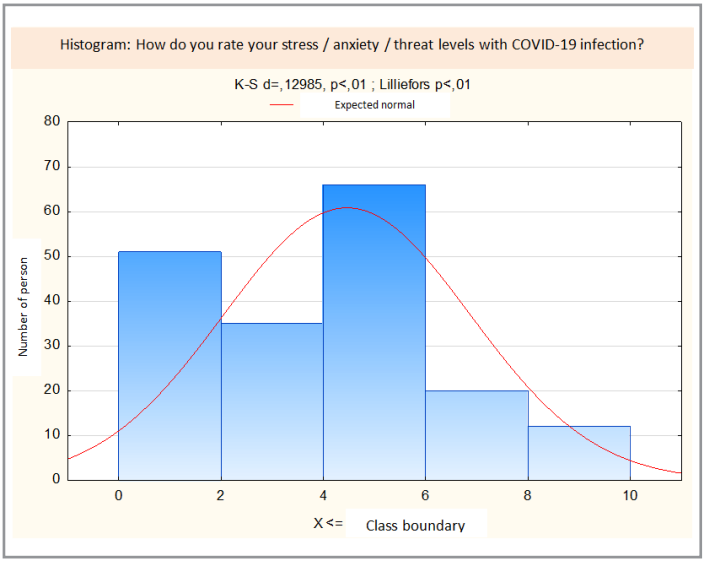
Background/Aims: The Post-Traumatic Stress Disorder Related to COVID-19 Questionnaire (COVID-19-PTSD) is a first tool designed to assess the severity of PTSD symptoms related to the pandemic. This study aimed to translate and investigate psychometric properties of the Polish version of COVID-19-PTSD in a sample of healthcare workers.

Materials and Methods: The PTSD symptoms were investigated among 184 participants (physicians, nurses, and paramedics). The respondents completed Post-Traumatic Stress Disorder Related to COVID-19 Questionnaire (COVID-19-PTSD) via online survey. The psychometric properties (i.e., internal consistency, validity, and reliability) of the Polish version of COVID-19-PTSD were analyzed.

Results: The findings showed that the Polish version of COVID-19-PTSD is a reliable instrument. The total and subscale scores demonstrated good internal consistency. We also found that almost 32% of healthcare workers met the criteria of provisional PTSD diagnosis.

Conclusions: The findings of our study confirmed good validity and reliability of the Polish version of COVID-19-PTSD which can be recommended to be used as a reliable screening tool to conduct psychological screening among Polish healthcare workers.



ABS 10 Figure 1.

4-factor model	Cronbach's alpha	Mean correlation
Re-experiencing	0.92	0.75
Avoidance	0.79	0.66
Negative alterations in cognition and mood	0.82	0.46
Increased arousal and reactivity	0.88	0.54
7-factor model	**Cronbach's alpha**	**Mean correlation**
Intrusion	0.92	0.75
Avoidance	0.79	0.66
Negative Affect	0.72	0.47
Anhedonia	0.88	0.73
Dysphoric arousal	0.79	0.66
Anxious arousal	0.76	0.62
Externalizing behavior	0.86	0.71

***ABS 10** Table 1. Reliability analysis of the COVID-19-PTSD.*

ABS 11 – ID 409

IMPLEMENTING A DELIRIUM RISK STRATIFICATION TOOL AND ROUNDS TO IDENTIFY AND PREVENT DELIRIUM IN OLDER ADULTS

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Atrium Health, USA

Delirium is a disturbance of attention accompanied by a change in baseline cognition that is commonly seen in acute care settings, and effects up to 80% of ICU patients[1]. The development of delirium has adverse effects on patient outcomes and high health care costs[2].

Of patients aged 65+ admitted to our hospital in 2019, non-delirious patients had a five-day length of stay (LOS) compared to 10-14 days LOS in delirious patients. The five days LOS adds an additional $ 8,325 per patient for an extra annual cost of 15 million dollars. Additionally, delirium is often not recognized. A prior retrospective study showed that 31% of older adults seen by a Geriatrics provider were diagnosed with delirium, while only 11% were detected by nurse's CAM screen.

Given the need to improve delirium detection and management, a QI project was undertaken with a goal to recruit an interdisciplinary team, create a risk stratification tool to identify patients at substantial risk for developing delirium, and develop a delirium prevention protocol. Patients with a score of ≥ 4 were initiated on a nurse driven delirium protocol that included a delirium precaution sign and caregiver education.

Overall, LOS decreased by 6.3 days (p = 0.01), a 24% reduction was actualized in SNF disposition, and nursing delirium detection rate improved by 46%. Of 435 patients, 58% were low risk, 22% were medium risk, and 20% were high-risk. Of 38 patients, 28 (74%) in the high-risk category had delirium, while 9 (23%) patients in the medium risk had delirium, and 1 (3%) patient in low risk had delirium.

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THE PHENOMENOLOGY OF DELIRIUM IN PARKINSON'S DISEASE

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Background: Delirium is a neuropsychiatric syndrome defined by acute changes in attention, level of arousal and cognition. Delirium is common and serious, occurring in over half of patients with Parkinson's disease (PD) in hospital. In non-PD, delirium is associated with poor outcomes including longer hospital admissions, dementia and increased mortality. However, the diagnosis of delirium is often missed in PD perhaps due to the overlap in their neuropsychiatric symptoms.

Aims: To better understand the phenomenology and natural history of delirium in PD. We will compare how features of delirium, including severity, symptoms and duration, differ between participants with and without PD.

Methods: Participants with a diagnosis of PD or PD dementia (PDD) admitted to Newcastle upon Tyne Hospital Trust were invited to take part (the Defining Delirium and its Impact in Parkinson's Disease [DELIRIUM-PD] study). Participants were compared with those from the Delirium and Cognitive Impact in Dementia (DECIDE) study. Over a 12-month period, the DECIDE study recruited participants from the Cognitive Function and Ageing Study II-Newcastle cohort (aged ≥65 years) on admission to hospital. In both studies, delirium was diagnosed across consecutive days using a standardised approach based on the Diagnostic and Statistical Manual (DSM-5) criteria and severity was captured using the Memorial Delirium Assessment Scale (MDAS).

Results: The pooled cohort consists of 320 participants; n=122 from 212 admissions with PD and 198 older adults from 306 admissions. During any admission, 29.4% of admissions without PD had a diagnosis of delirium (n = 90) whereas 64.6% of the PD admissions had delirium (n=137).

Discussion: We have shown that delirium is more common in PD compared to older adults. This study will aid in the accuracy of symptom recognition and, subsequently, the prognosis of delirium in PD. This could affect earlier identification of precipitating factors, which could be managed, potentially reducing length of hospital stay and poor outcomes related to delirium.

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