



Articles

The Year's Most Influential Delirium Studies: Highlights from the American Delirium Society 2025 Year in Review

Blair P. Golden, MD, MS¹, Mark L. Rolfsen, MD, MSCI², Maureen Choman, MD³, Jonathan Blohm, MD, MS⁴, C. Adrian Austin, MD, MSCR⁴

¹ Division of Hospital Medicine, Department of Medicine, University of Wisconsin-Madison School of Medicine and Public Health, ² Vanderbilt University Medical Center, ³ Division of Geriatrics, Gerontology, and Palliative Medicine and Division of Hospital Medicine, Department of Internal Medicine, University of Nebraska Medical Center, ⁴ Department of Medicine, University of North Carolina School of Medicine

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Delirium

Background

Since 2015, the American Delirium Society (ADS) has hosted an annual Year-in-Review session to highlight and disseminate the year's most rigorous and impactful delirium research. We aim to summarize the key findings and innovations from this year's featured publications.

Methods

Members of the ADS Research Committee identified and nominated up to three research articles published between August 1, 2024, and July 31, 2025, that they considered to be the most influential. The 24 nominated articles were divided into three categories: studies focused on delirium risk prediction and/or biomarkers (n=9), observational and epidemiological studies (n=8), and interventional trials (n=7). Reviewers evaluated all manuscripts within a category on two criteria- scientific rigor and overall impact- using a previously published, standardized rubric with total scores ranging from 0-20. Total scores were averaged across reviewers, with the three highest-scoring manuscripts presented during the Year-in-Review webinar.

Results

Each study was independently reviewed by 5-10 American Delirium Society Research Committee members. The mean scores (with standard deviation) were comparable across categories: 13.4 (1.0) for delirium risk prediction and biomarkers, 14.1 (1.7) for observational and epidemiological studies, and 13.6 (1.8) for interventional trials. The nine selected articles represent a wide range of methodological and clinical diversity, including biomarker-based approaches to delirium identification, large-scale cohort studies, and both pediatric and adult clinical trials targeting delirium prevention.

Conclusions

The diversity of studies presented for the 2025 ADS Year-in-Review session illustrates the breadth and potential impact of recent delirium research. These results span bench to bedside and are indicative of the growth in the delirium research field over the past decade.

INTRODUCTION

Since 2015, the American Delirium Society (ADS) has hosted an annual research Year-in-Review session to highlight and disseminate the year's most impactful delirium research. ADS has standardized and refined its selection procedures over time to ensure transparency and promote representation of diverse research that spans the methodological and clinical breadth of delirium research.¹

In this report, we briefly outline the 2025 article selection process (including article nomination, review, and

scoring methods) and provide an overview of the articles presented during the 2025 Year-in-Review webinar held on November 24, 2025.

METHODS

The ADS Year-in-Review is coordinated annually by the ADS Research Committee, a multi-disciplinary team comprised of clinicians, researchers, and patient advocates with broad representation from delirium-related specialties, including nursing, critical care, neurology, anesthesia, geri-

Table 1. Review criteria for ADS Year-in-Review

Criteria	Score range (0-10) with description
Scientific rigor: Is the methodology sound?	0 = Major design or bias concerns that undermine the validity of results 2 = Major design or bias concerns that cast serious doubt on the validity of results 4 = One or two major or multiple minor design or bias concerns that cast considerable doubt on the validity of results 6 = No major concerns but multiple minor design or bias concerns that cast some doubt on the validity of results 8 = A few minor design or bias concerns that introduce no more than limited questions regarding the validity of results 10 = Methodologically sound without design or bias concerns
Overall impact & importance: Does this study matter?	0 = Ignore it. No relevance or addition to field 2 = Extremely limited value. Only a niche group might find useful 4 = Some limited value. May be worthwhile to share with others, explore further 6 = Suggestive results. Warrants further discussion and/or study 8 = Promising results. Places new perspectives into translational or application cycle of research 10 = Conclusive. I will implement into my practice and share with a larger audience

atrics, and psychiatry. Each member of the ADS Research Committee nominated up to 3 primary research articles published between August 1, 2024, and July 31, 2025, that they considered to be the most impactful and influential to the delirium field. Because the goal of the Year-in-Review is to highlight original, primary research, we excluded any systematic reviews, meta-analysis, or case reports. As with prior years, we used the date that the articles' digital object identifier (DOI) was assigned to determine dates of eligibility given that online publication practices can vary across journals.¹

Each year, nominated articles are assigned into one of three categories based on their methodology, clinical focus, or other key characteristics with the goal of presenting outstanding articles that represent the scientific and clinical range of nominated articles. This year, we divided these studies into categories based on methodology and/or area of focus: studies focused on delirium risk prediction and/or biomarkers (n=9), observational and epidemiological studies (n=8), and interventional trials (n=7). All committee members were assigned to review articles within one of these categories based on their area of expertise. Each study was independently reviewed by 5-10 research committee members. Reviewers evaluated all manuscripts within a category on two criteria- scientific rigor and overall impact- using a previously published rubric (Table 1) with scores ranging from 0 to 10 for each criteria (10 being the highest score).¹ Any committee members who were co-authors on studies were recused from reviewing their own articles. Total scores (scientific rigor and overall impact) were averaged across reviewers. The articles with the three highest mean scores within each category were selected to present during the Year-in-Review webinar.

RESULTS

In total, 24 studies were nominated. The mean score for each category (with standard deviation) was 13.4 (1.0) for delirium risk prediction and biomarkers, 14.1 (1.7) for observational and epidemiological studies, and 13.6 (1.8) for

interventional trials. Table 2 summarises the selected studies.

OBSERVATIONAL AND EPIDEMIOLOGICAL STUDIES

OCCURRENCE, ASSOCIATED FACTORS, AND OUTCOMES OF DELIRIUM IN PATIENTS IN AN ADULT ACUTE GENERAL MEDICINE SERVICE IN ENGLAND: A 10-YEAR LONGITUDINAL, OBSERVATIONAL STUDY

There are limited studies of long-term outcomes from delirium outside of intensive care settings, and few of these studies stratify by important co-morbidities such as dementia.^{11,12} This study aimed to assess age-specific delirium occurrence in hospitalized patients and identify factors associated with delirium.² The authors also examined whether delirium predicted both short and long-term adverse outcomes, most notably, 10-year mortality after discharge.

This longitudinal, observational study included consecutive adult patients (≥ 16 years old) admitted to general internal medicine services at a single hospital between 2010-2018. Older adults (≥ 65 years of age) and patients with altered behavior or delirium risk factors underwent delirium screening on admission. Delirium was identified using the Confusion Assessment Method (CAM) and was characterized as prevalent (present within 48 hours of admission), incident (developing ≥ 48 hours after admission), or both (meaning delirium was present, the patient was delirium free for 48 hours, and then a new episode occurred). Mortality up to 10 years after discharge was determined using administrative data from the Office of National Statistics (UK).

Among 1,846 hospitalized adults, 23% had delirium. Of these, most (68%) had prevalent delirium, 17% had incident delirium, and 15% had both. In multivariate analysis, dementia, visual impairment, care dependency, and frailty were associated with increased delirium risk.

Patients with delirium also experienced greater long-term mortality (4.1 deaths per 10 person-years in those with delirium vs. 1.8 per 10 person-years in those without). Among patients with delirium, the risk of death was highest

Table 2. Overview of selected studies

Observational and epidemiological studies								
Author/ year	Design	Setting	Population/ sample, including size	Exposure	Outcome	Results	Strengths/ Weaknesses	Implications
Gan et al, 2025 ²	Longitudinal observational cohort (10-year follow-up)	Acute general medicine hospital wards (United Kingdom)	Consecutive adult admissions ≥ 16 years (n=1,846)	Delirium (prevalent, incident, recurrent)	Long-term mortality	Delirium occurred in 23% and was associated with increased mortality up to 10 years after discharge (aHR: 1.52),	Strengths: long follow-up; detailed delirium phenotyping. Weaknesses: single center; screening limited to higher-risk patients.	Highlights persistent long-term mortality risk following delirium and supports delirium screening in older adults and those with risk factors
Park et al, 2025 ³	Cross-sectional analysis of nationally representative Medicare data	Skilled nursing facilities (SNFs) (United States)	Medicare beneficiaries admitted to SNFs (n=8,874 with delirium at admission)	Year of admission (2014 vs 2019)	Delirium persistence and 30-day mortality	Persistent delirium and 30-day mortality were significantly lower in 2019 compared with 2014.	Strengths: national dataset; policy-relevant comparison. Weaknesses: reliance on MDS CAM; limited clinical granularity.	Suggests improvements in post-acute delirium recognition and outcomes following standardized assessment requirements.
Sun et al, 2025 ⁴	Retrospective cohort study with propensity matching	Care provided through the National Health Insurance program that required inpatient admission (Taiwan)	Older adults with type 2 diabetes (n=133,136)	Metformin use and dose	Delirium incidence and mortality	Metformin use associated with lower delirium incidence and mortality; dose-response relationship observed (highest quartile HR 0.53).	Strengths: large sample; robust adjustment. Weaknesses: potential residual confounding; use of administrative data	Supports potential neuroprotective effects of metformin and warrants mechanistic and prospective investigation.
Delirium risk prediction and biomarkers								
Author/ year	Design	Setting	Population/ sample, including size	Risk factor / biomarker	Outcome	Results	Strengths/ Weaknesses	Implications
Hu et al, 2025 ⁵	Prospective observational cohort with nested	Single-country surgical cohort	Older adults undergoing noncardiac surgery	Oral frailty (OFI-8); oral microbiota composition	Postoperative delirium (POD)	Oral frailty independently associated with POD (HR 1.75). POD cases	Strengths: prospective design; integrated clinical and microbiome	Identifies oral frailty as a potentially modifiable delirium risk factor and

	microbiome analysis	(China)	(n=303)			showed reduced microbial diversity and distinct taxa enrichment and depletion patterns.	data. Weaknesses: single population; observational; microbiome subgroup smaller.	supports a possible oral-brain axis in delirium vulnerability.
Reese et al, 2025 ⁶	Secondary analysis of three prospective studies	Single academic medical center (United States)	Older adults undergoing non-cardiac, non-neurological surgery (n=82)	Anesthetic dose-adjusted intraoperative EEG alpha power	POD; delirium severity	Lower alpha power associated with increased odds of POD (OR 1.44) and higher delirium severity; moderate predictive discrimination (AUC 0.71).	Strengths: physiologic measure; adjustment for anesthetic dose. Weaknesses: small sample; secondary analysis.	Supports anesthetic-adjusted EEG metrics as markers of delirium susceptibility and larger validation studies.
Pham et al, 2025 ⁷	Prospective cohort study	Single-center medical intensive care unit (United States)	Mechanically ventilated adults with acute respiratory failure (n=100)	Serum neurofilament light (NF-L); brain-derived neurotrophic factor (BDNF)	In-hospital delirium	Higher NF-L and lower BDNF levels independently associated with delirium (adjusted OR 1.86 and 0.43, respectively).	Strengths: biologically plausible biomarkers; prospective sampling. Weaknesses: modest sample size; single-center.	Suggests circulating CNS biomarkers may reflect neuronal injury and vulnerability associated with ICU delirium.
Interventional trials								
Author/ year	Design	Setting	Population/ sample, including size	Intervention	Outcome	Results	Strengths/ Weaknesses	Implications
Hatta et al, 2024 ⁸	Double-blind randomized placebo-controlled trial	50 hospitals (Japan)	Hospitalized older adults at high risk for delirium (n=203)	Suvorexant 15 mg nightly vs placebo	Incident delirium	Delirium occurred in 17% of suvorexant group vs 26% of placebo (difference -8.7%, p=0.13); more falls and hallucinations in intervention group.	Strengths: multicenter RCT; high-risk population. Weaknesses: potentially underpowered; safety concerns.	Did not demonstrate efficacy; highlights need for careful safety evaluation of sleep-targeted interventions.
Spence et al, 2025 ⁹	Pragmatic cluster randomized crossover trial	20 cardiac surgical centers (North America)	Adults undergoing cardiac surgery (n=19,768)	Benzodiazepine-restricted vs liberal anesthesia policy	Postoperative delirium	Delirium in 14.0% of patients during restricted periods vs 14.9% in liberal periods (adjusted OR 0.92, p=0.07)	Strengths: large sample; real-world design. Weaknesses: small absolute benzodiazepine dose difference.	Restrictive benzodiazepine policy alone may be insufficient to reduce delirium after cardiac surgery. Safety of higher benzodiazepine doses was not established

Miyasaka et al, 2025 ¹⁰	Single-center randomized controlled trial	Pediatric surgical center (Japan)	Children aged 1–6 years undergoing general anesthesia (n=177)	EEG-guided sevoflurane titration vs standard care	Pediatric anesthesia emergence delirium (PAED)	PAED occurred in 35% of standard care group vs. 21% of patients with EEG guidance (p=0.04); sevoflurane exposure reduced.	Strengths: blinded outcome assessment; physiologic targeting. Weaknesses: single-center; pediatric-specific outcome.	Demonstrates feasibility of EEG-guided anesthesia to reduce emergence delirium; generalizability requires further study.
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in the immediate discharge period but remained elevated for up to ten years after discharge (adjusted HR 1.52, 95% CI: 1.30-1.77).

This study highlights patient demographics, clinical characteristics, and hospital factors associated with a higher risk for delirium and its consequences. Additionally, the authors emphasize the need for targeted delirium screening in younger patients who are at risk, even though they may lack a known dementia diagnosis, appear less frail, and be community dwelling prior to hospitalization.

PERSISTENCE OF DELIRIUM IN POSTACUTE CARE AT SKILLED NURSING FACILITIES

Prior work suggests that 1 in 4 patients have delirium on admission to skilled nursing facilities (SNFs) and that persistent delirium is associated with adverse outcomes, including hospital readmission and increased mortality.¹³⁻¹⁵ The primary objective of this study was to determine if persistent delirium at SNFs has decreased since passage of the Improving Medicare Post-Acute Care Transformation (IMPACT) Act in 2014.³ The IMPACT Act requires post-acute care providers to collect and report standardized patient data such as the Resident Assessment Instrument Minimum Data Set (MDS) for Medicare patients admitted to SNF.¹⁶ The MDS requires a delirium screen with the Confusion Assessment Method (CAM) within 14 days of admission to SNF and a follow up CAM assessment within 30 days (unless the patient discharges or dies).

The authors performed a cross-sectional study with a nationally representative 5% random sample of Medicare beneficiaries admitted to SNFs in 2014 and 2019. The primary outcome was change in delirium status within 30 days of SNF admission, assessed through the CAM contained within the MDS. The authors performed logistic regression analysis to calculate the relative risk of persistent delirium or death to resolved delirium between 2014 and 2019.

The study found that 4.3% of patients had delirium at SNF admission in 2014, compared to 2.5% in 2019. Further analysis of the 8,874 patients who had delirium at admission and a completed follow-up CAM screen within 30 days revealed that rates of delirium resolution significantly increased (28% vs. 36%, $p < 0.001$) between 2014 and 2019. In adjusted models, patients had lower rates of persistent delirium (relative risk ratio: 0.68, 95% CI 0.61-0.76) and lower mortality (relative risk ratio: 0.72, 95% CI: 0.62-0.85) in 2019 compared to 2014.

These findings suggest that there have been improvements in rates of delirium resolution and 30-day mortality among patients admitted to a SNF for post-acute care between 2014 and 2019. The study authors emphasize that while results seem to suggest at least an indirect influence on clinical outcomes from a national policy, clinicians should still focus on delirium prevention and management given the high rates of delirium in the post-acute care setting.

METFORMIN USE AND RISK OF DELIRIUM IN OLDER ADULTS WITH TYPE 2 DIABETES

Prior work suggest that metformin, a widely used diabetes medication, may have potential neuroprotective properties.¹⁷ The primary objective of this study was to determine if metformin use reduces the risk of delirium in older patients with type 2 diabetes and to determine if any effect is dose dependent.⁴

This retrospective study utilized the National Health Research Database of Taiwan and enrolled participants who were ≥ 65 years of age with Type 2 diabetes between 2008-2019 with follow-up extending to 2021. Two groups of 66,568 participants each were identified - those who consistently used metformin as their primary glucose-lowering medication and those who used a medication other than metformin as their primary glucose-lowering medication. Patients with a history of pre-existing dementia or delirium (or within 1 year of starting glucose-lowering medications) or death within 1 year of starting glucose-lowering medication were excluded. Trained clinicians would assess for delirium at clinical encounters if cognitive impairment or acute changes in mentation were noted. The authors used propensity matching to balance characteristics between groups. The authors performed multivariable regression analysis to compare rates of delirium and mortality between groups and conducted a competing risk analysis accounting for mortality risk.

The incidence of delirium was significantly lower in the metformin group (2.2% vs 3.6%, $p < 0.0001$) as was all cause mortality (7.2% vs 11.3%, $p < 0.0001$). The risk of delirium decreased with increasing cumulative daily doses of metformin. For the highest quartile of the cumulative daily dose, the adjusted hazard ratio for having delirium was 0.53 (95% CI 0.46-0.61, $p < 0.0001$). This study supports burgeoning research that demonstrates the potential neuroprotective effects for metformin use.

DELIRIUM RISK PREDICTION AND BIOMARKERS

ASSOCIATIONS BETWEEN ORAL FRAILITY, ORAL MICROBIOTA COMPOSITION, AND POSTOPERATIVE DELIRIUM IN OLDER PATIENTS

Poor oral health, particularly in older adults, is associated with decreased overall health and increased frailty.¹⁸ Oral frailty refers to specific frailty factors such as age-related deterioration in oral functioning, swallowing, chewing and oral hygiene. Oral frailty, is associated with increased risk of cognitive impairment and increased susceptibility to oral infections.^{19,20}

This study examined the associations between oral frailty, oral microbiota composition, and postoperative delirium (POD) in a prospective cohort of 303 older adults undergoing noncardiac surgery.⁵ Oral frailty, defined using the Oral Frailty Index-8, was independently associated with increased risk of POD (HR 1.75; 95% CI: 1.04-2.96, $p = 0.035$).⁵ In a nested microbiome analysis, patients who developed POD exhibited reduced alpha diversity and significant shifts in microbial composition, with enrichment

of taxa such as *Abiotrophia* and *Lautropia* and depletion of commensal genera including *Dialister* and *Fusobacterium*.

These findings support a potential oral-brain axis in delirium pathogenesis, in which oral health and microbial dysbiosis may contribute to systemic inflammation and neurocognitive vulnerability. This study highlights that oral frailty may independently increase the risk of postoperative delirium in older surgical patients.

ASSOCIATIONS BETWEEN ANESTHETIC DOSE-ADJUSTED INTRAOPERATIVE EEG ALPHA POWER, PROCESSING SPEED, AND POSTOPERATIVE DELIRIUM: ANALYSIS OF DATA FROM THREE PROSPECTIVE STUDIES

Low intraoperative EEG alpha power is associated with impaired preoperative cognition, a delirium risk factor.²¹ In addition, intraoperative anesthetic-dose adjusted EEG values have been associated with a four-fold increase in postoperative delirium.²² Using a secondary analysis, researchers sought to evaluate whether anesthetic dose-adjusted intraoperative EEG alpha power is associated with postoperative delirium and delirium risk factors.⁶ Data from 82 non-cardiac, non-neurologic, elective surgical patients over 60 years old were analyzed. Lower dose-adjusted alpha power was significantly associated with increased odds of POD (OR 1.44; 95% CI: 1.09-1.89, $p=0.009$) and greater delirium severity, with predictive performance in the moderate range (AUC 0.71).

These results suggest that intraoperative anesthetic-dose adjusted frontoparietal alpha power was associated with delirium and delirium-predisposing factors. Overall, this work suggests the use of anesthetic-dose adjusted EEG-derived metrics as physiologic markers of delirium susceptibility in surgery and motivates further validation in larger cohorts.

ASSOCIATION OF CENTRAL NERVOUS SYSTEM-RELATED BIOMARKERS WITH HOSPITAL DELIRIUM IN PATIENTS WITH RESPIRATORY FAILURE IN THE ICU

Emerging evidence has focused on serum biomarkers as measures of brain injury and vulnerability associated with delirium.^{23,24} In this study, researchers evaluated the association between circulating Central Nervous System (CNS)-related biomarkers and hospital delirium in a prospective cohort of 100 mechanically ventilated ICU patients with acute respiratory failure.⁷ Delirium occurred in 73% of patients and was independently associated with higher neurofilament light chain (NF-L) (adjusted OR 1.86; 95% CI: 1.09-3.43) and lower brain-derived neurotrophic factor (BDNF) (adjusted OR 0.43; 95% CI: 0.15-0.82) levels measured at ICU admission.⁷

These findings signal possible mechanistic roles where elevated NF-L levels could reflect neuronal injury while lower BDNF levels may indicate impaired synaptic plasticity or neuroprotection.

INTERVENTIONAL TRIALS

SUVOREXANT FOR REDUCTION OF DELIRIUM IN OLDER ADULTS AFTER HOSPITALIZATION: A RANDOMIZED CLINICAL TRIAL

Sleep disruption and delirium have demonstrated a bidirectional relationship in hospitalized adults, where data suggest the presence of one condition increases risk of the other.²⁵ This double-blinded, placebo-controlled trial tested the hypothesis that the orally administered orexin receptor antagonist suvorexant would reduce delirium in older adults at high risk for delirium after hospitalization.⁸

Older adults were recruited from 50 hospitals in Japan. Inclusion criteria included age 65-90 years, hospitalization for acute illness or elective surgery, and presence of mild cognitive impairment, mild dementia, and/or history of delirium in prior hospitalizations. Patients were randomized in a 1:1 ratio to receive suvorexant (15mg nightly) or placebo. Delirium assessments were performed daily and "anytime delirium was suspected" using criteria from the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5).²⁶ The study drug was discontinued if positive delirium assessment occurred.

The study was conducted from October 2020 through December 2022. Overall, 207 participants were randomized and 203 received treatment (101 with placebo and 102 with suvorexant). Notable baseline and clinical characteristics included the following: 91% age ≥ 75 and 93% with documented MCI or dementia. The primary endpoint of incident delirium occurred in 17 (17%) of the suvorexant group and 27 (26%) of the placebo group for a difference between groups of -8.7% (95% CI -20.1 to 2.6; $p=0.13$). Safety outcomes were similar, although more falls and hallucinations occurred in the suvorexant group.

This study was unable to show efficacy of suvorexant compared to placebo in preventing delirium. A smaller than anticipated effect might still exist, and the benefit to lower risk populations remains unknown. Safety outcomes (e.g. falls) warrant monitoring in any future investigations.

BENZODIAZEPINE-FREE CARDIAC ANESTHESIA FOR REDUCTION OF POSTOPERATIVE DELIRIUM: A CLUSTER RANDOMIZED CROSSOVER TRIAL

Benzodiazepines are frequently used as part of general anesthesia.²⁷ While this drug class has shown consistent association with developing delirium in other populations (e.g. critically ill adults),^{28,29} its effects on delirium after cardiac surgery are less clear. The B-FREE study investigated whether an institutional policy of restricted intraoperative benzodiazepine administration reduced the incidence of postoperative delirium.⁹ The study took place in 20 North American cardiac surgical centers and used a pragmatic, multiperiod, patient and assessor-blinded, cluster randomized crossover design. All adults undergoing open cardiac surgery during the trial period were included with a waiver of individual patient consent.

From November 2019 through December 2022, 19,768 patients (mean age 65) underwent cardiac surgery. Clini-

cians adhered to the assigned policy in 91% of patients (restricted group) and 93% (liberal group), respectively. This resulted in a median of 0.0mg of midazolam equivalent usage per patient in the restricted group and 4.0mg midazolam equivalent in the liberal group. The primary outcome of delirium occurred in 14.0% during restricted periods versus 14.9% during liberal periods (adjusted Odds Ratio 0.92; 95% CI 0.84-1.01; $p = 0.07$). No statistical differences were observed in secondary outcomes.

In this large, multi-center cluster crossover randomized trial, a policy of restrictive benzodiazepine use during cardiac surgery did not reduce incidence of delirium. The total dose of benzodiazepines in the liberal group was small, and the safety of higher doses during cardiac surgery could not be determined.

EEG-GUIDED TITRATION OF SEVOFLURANE AND PEDIATRIC ANESTHESIA EMERGENCE DELIRIUM: A RANDOMIZED CLINICAL TRIAL

Pediatric anesthesia emergence delirium (PAED) is common following general anesthesia for pediatric patients, characterized by lack of eye contact, non-purposeful movements, unawareness of surroundings, restlessness, and inconsolability.¹⁰ This study tested the hypothesis that electroencephalography (EEG) monitoring would reduce PAED by minimizing exposure to sevoflurane, an inhaled anesthetic.¹⁰ The investigators performed a single-center, parallel group randomized controlled trial in Japan. Pediatric patients (ages 1 to 6 years) undergoing general anesthesia were randomized in a 1:1 ratio to EEG-guided titration of anesthesia to minimize sevoflurane use (EEG-guided group) or standard 1.0 minimum alveolar concentration (MAC) sevoflurane anesthesia (control group). The primary outcome was the proportion of patients who developed PAED, defined as a maximum PAED score of 10 or higher. Assessments were performed by a blinded observer on PACU arrival through 30 minutes or until emergence.

Between October 2021 and March 2023, 200 patients were randomized with 177 completing follow-up. These patients were 71% male with a mean age 2.8 years in the control group and 2.9 years in the EEG-guided group. The EEG-guided group had a reduced sevoflurane exposure by 1.4 MAC-hours compared to the control group (96.65% CI, 1.1 to 1.6). The primary outcome of PAED occurred in 30 (35%) of control group and 19 (21%) of EEG-guided group, for a difference of 14% (95% CI 0.92-27%, $p = 0.04$). These results suggest that EEG-guided management of general anesthesia can reduce sevoflurane exposure and PAED.

DISCUSSION

The nine studies selected for the 2025 ADS Year-in-Review highlight the methodological and clinical depth and diversity of contemporary delirium research.

The risk prediction and biomarker studies presented intriguing data that likely warrants further investigation. Oral frailty and oral dysbiosis was associated with increased risk of postoperative delirium. Intraoperative frontoparietal al-

pha power may predict the risk of delirium. Altered NF-L and BDNF levels could provide serum biomarkers of delirium presence.

The presented observational and epidemiological studies underscore the continued clinical burden of delirium in hospital and post-acute care settings. The first two studies provide evidence to support routine delirium screening for adults ≥ 65 years old who are admitted to the hospital and for adults admitted to SNFs for post-acute care given the high rates of delirium in these populations. The final study suggests that metformin may reduce delirium risk; future work is needed to characterize the mechanism of this potential effect and to confirm the association between metformin use and delirium risk.

The interventional trials illustrate the complexity and challenges of designing effective strategies to improve delirium outcomes in real-world practice. The first two trials (a randomized trial of suvorexant compared to placebo and a pragmatic study aimed at reducing benzodiazepine exposure during cardiac anesthesia) did not show significant improvements in delirium rates. In contrast, a trial of EEG-guided anesthesia titration among pediatric patients demonstrated a significant reduction in emergence delirium; the generalizability of these findings to other surgical centers who might have different anesthesia practices warrants further investigation.

The 2025 ADS Year-in-Review session highlights the growing scientific diversity of study designs and investigations in delirium research. This diversity stresses the importance of improving delirium management within the clinical and scientific communities.

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- Drafting of manuscript: All authors
- Reviewing manuscript for critical revisions: All authors
- Final approval of manuscript: All authors

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DECLARATION OF INTERESTS

The authors have no conflicts to disclose

DISCLAIMERS

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