

**Optimizing Delirium Assessment in Research
Proposals** Presenter: Rich Jones, ScD

Time	Section
02:23	<p><u>Overview</u></p> <ul style="list-style-type: none"> • What reviewers are looking for in research proposals, with regard to choice in measurement instruments • How NIDUS resources can help giving reviewers what they want and strengthen the design of your research • Strategies for choosing an instrument for your proposed research
03:04	<p><u>What reviewers are looking for</u></p> <ul style="list-style-type: none"> • What reviewers want <ul style="list-style-type: none"> ○ Excellent science <ul style="list-style-type: none"> ▪ Strong designs that answer well-formed questions (approach, rigor) ▪ Questions and answers that advance the field (significance, innovation) ▪ Research designs that are ethical and feasible (approach, environment, investigators) ▪ Clarity and efficiency in presentation (pleasant and quick to read) • How does this relate to delirium assessment? <ul style="list-style-type: none"> ○ Delirium assessments should <ul style="list-style-type: none"> ▪ match with the goals of measurement ▪ match with the population being assessed ▪ match with the assessor ▪ have some validity evidence for research context
04:26	<p><u>Match with goals of measurement</u></p> <ul style="list-style-type: none"> • Delirium case identification • Delirium severity <ul style="list-style-type: none"> ○ An episode of delirium, or severity of delirium during a stay? ○ Symptom severity (peak of symptom count/sum; sum over all days) ○ Duration of delirium during stay
05:30	<p><u>Match with the population being assessed</u></p> <ul style="list-style-type: none"> • Type of patient <ul style="list-style-type: none"> ○ Capacity to participate in assessment (this is usually the difference in patients)
06:15	<p><u>Match with the assessor</u></p> <ul style="list-style-type: none"> • Physician? • Nurse? • Other caregiver? • Family? • Lay interviewer?
06:35	<p><u>Validity evidence for research context</u></p> <ul style="list-style-type: none"> • Has the instrument been used in patients similar to the planned population previously? • Is there any validity evidence for the use of the chosen instrument in the planned research context? • Example of validity evidence (figure from systematic review) <ul style="list-style-type: none"> ○ Please remember reliability and validity statistics are sample-dependent and context-dependent results and do not describe immutable properties of a test
09:16	<p><u>NIDUS resources that might be helpful</u></p> <ul style="list-style-type: none"> • Measurement and harmonization core tab • Information cards summarizing key information for delirium instruments (adult and pediatric) <ul style="list-style-type: none"> ○ Shows example of information card ○ Goes through 3D-CAM info card section by section

- COSMIN (COnsensus-based Standards for the selection of health Measurement INstruments)
 - Reliability: the degree to which the measurement is free from measurement error
 - Internal consistency reliability: the degree to the interrelatedness among the items
 - Validity: the degree to which [the] instrument measures the construct(s) it purports to measure
 - Content validity: the degree to which the content of [the] instrument is an adequate reflection of the construct to be measured
 - Hypothesis testing: the degree to which the scores of the [the] instrument are consistent with hypotheses based on the assumption that the instrument validity measures the construct to be measured
 - Responsiveness: the ability of [the] instrument to detect change over time in the construct to be measured
 - Interpretability: the degree to which one can assigned qualitative meaning—that is, clinical or commonly understood connotations—to an instrument’s quantitative scores or change in scores
 - COSMIN checklist manual (gives frameworks)
 - Effect indicators (a COSMIN-guided review of measurement properties)
 - Does the scale consist entirely of effect indicators?
 - Effect indicators are caused by delirium
 - Effect indicators are appropriate for use in a reflective measurement model
 - Cause or formative indicators are factors that might be risk factors for, or otherwise determine levels of, delirium or delirium severity
 - Acknowledging that the pathophysiology of delirium is imperfectly understood, please use your best judgement
 - Content Validity (a COSMIN-guided review of measurement properties)
 - Internal Consistency (a COSMIN-guided review of measurement properties)
 - Inter-rater reliability (a COSMIN-guided review of measurement properties)
 - Convergent validity (a COSMIN-guided review of measurement properties)
 - Criterion validity (examples), predictive validity, or responsiveness (a COSMIN-guided review of measurement properties)
 - Scoring (a COSMIN-guided review of measurement properties)
 - Assign 1 point if each of (1) Content validity, (2) all Effect Indicators, (3) Internal Consistency, (4) any aspect of Reliability, (5) Convergent Validity and (6) Criterion were assessed
 - Subtract 0.5 point if Internal Consistency was based on fewer than 50 observations
 - Subtract 0.5 point if Reliability was based on less than 50 observations
 - Subtract 0.5 point if Convergent validity was based on less than 50 persons
 - Subtract 0.5 point if Criterion was based on less than 50 persons
- NIDUS Measurement core COSMIN rating (32:27)
 - Is a very high-level summary of the original publication describing the instrument
 - Does not reflect any validation research subsequent to the original publication
 - Only partially represents the full COSMIN framework

	<ul style="list-style-type: none"> ▪ Might be unfairly applied to instruments described before the circa 2010 COSMIN framework was described
33:43	<p><u>Strategies for choosing an instrument</u></p> <ul style="list-style-type: none"> • Feasibility <ul style="list-style-type: none"> ○ What instrument(s) is/are used in you lab/hospital/city by mentors/collaborators? ○ Do you have access to training or other resources to make effective use of the instruments? • Reliability & Validity <ul style="list-style-type: none"> ○ Are the instruments suitable for the target population? ○ Do you have the right assessors? ○ Has the instrument be used in your target population previously? ○ With success? ○ Do instruments maximize sensitivity and specificity in a way most beneficial to your question? • Geographic clusters of using delirium instruments (maps)
36:53	<p><u>Final thought</u></p> <ul style="list-style-type: none"> • If you would like to know which of two or more instruments is the “best” for your target population (sensitivity, specificity, predictive value, reliability) • The only trustworthy data to inform this decision would be <ul style="list-style-type: none"> ○ Head-to-head comparison in same sample (e.g. randomized design) ○ Individual participant data meta-analysis (mega-analysis) • Individual (but separately conducted) studies and meta-analyses are not directly comparable (selection of patients, other design and analysis choices), publication bias, etc.
39:21	<p><u>Questions and Answers</u></p>