Preliminary Evaluation of a Measure for Reliable Assessment of Need for Constant Visual Observation in Adults with Traumatic Brain Injury

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Need for Constant Visual Observation

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Abstract

Primary objective: To develop and provide initial validation of a measure for accurately determining the need for Constant Visual Observation (CVO) in patients with traumatic brain injury (TBI) admitted to inpatient rehabilitation. Research design: Rating scale development and evaluation through Rasch analysis and assessment of concurrent validity. Methods and procedures: 134 individuals with moderate-severe TBI were studied in 7 inpatient brain rehabilitation units associated with the National Institute for Disability, Independent Living, and Rehabilitation Research (NIDILRR) TBI Model System. Participants were rated on the preliminary version of the CVO Needs Assessment scale (CVONA) and, by independent raters, on the Levels of Risk (LoR) and Supervision Rating Scale (SRS) at 4 time points during inpatient rehabilitation: admission, Days 2-3, Days 5-6, and Days 8-9. Outcomes and results: After pruning misfitting items, the CVONA showed satisfactory internal consistency (Person Reliability=.85-.88) across time points. With reference to the LoR and SRS, low false negative rates (sensitivity>90%) were associated with moderate to high false positive rates (29%-56%). Conclusions: The CVONA may be a useful objective metric to complement clinical judgment regarding the need for CVO; however, further prospective study is desirable to further assess its utility in identifying at-risk patients, reducing adverse events, and decreasing CVO costs.

Preliminary Evaluation of a Measure for the Reliable Assessment of Need for Constant Visual Observation in Adults with Traumatic Brain Injury

Patients with traumatic brain injury (TBI) admitted to inpatient rehabilitation units often present with severe cognitive, behavioral and physical deficits, i.e., confusion, impaired memory, impulsivity, agitation, lack of insight, and impaired balance. As a result, patient safety often is compromised. According to Beaulieu et al.[1] acute recovery following moderate to severe TBI is marked by alterations in responsiveness to the environment. Referred to as post-traumatic amnesia or confusion, this stage is a hallmark of early recovery and frequently results in the need for skilled nursing care in a hospital or brain rehabilitation unit. Agitated patients may resist direct care, be disruptive on the unit, and pose a physical risk to themselves, family, and staff all of which affect ability to engage in therapy.[2-6] Physically restraining agitated patients often worsens behavior. Restraint use has been associated with decreased cognitive and psychological well-being and can increase risk of serious injury ayet not positively impact fall rates.[7,8] In contrast, employing a multi-component approach to patient management resulted in reduced restraint use along with a decline in fall rate.[9]

Agitated and impulsive patients are often assigned 1:1 nurse-to-patient monitoring to reduce risk. Votruba and colleagues[10] describe the effects of impulsivity in patients with TBI and implications for rehabilitation and safety including increased risk of adverse outcomes, such as, accidents and subsequent injuries. Impulsivity impedes the rehabilitation process which in turn extends length of stay.. These authors further suggest that there is no substitute for clinician observation to assess the multidimensional construct of impulsivity. Bogner et al.[11] found that the presence of agitation measured by the Agitated Behavior Scale (ABS) was associated with increased length of hospital stay and poorer cognitive and motor functioning at discharge. The

ABS is a scale commonly referenced in studies on TBI patient safety.[6, 12,13] In a sample of 51 patients on a single rehabilitation unit, Amato and colleagues[12] demonstrated the feasibility, reliability and clinical utility of the ABS in considering the need for CVO but did not report the sensitivity and specificity or other detailed psychometric analyses of the measure.

Patients in acute rehabilitation are one of the most at risk groups for falls which carry huge financial implications.[14] Following least restrictive guidelines, most rehabilitation centers curtail use of physical restraints. As a result, use of coaches, sitters, patient care assistants, or nursing assistants to provide 1:1 care, also known as constant visual observation (CVO), has skyrocketed without established evidence of cost-effectiveness.[15-17] Eastwood and Schechtman[18] estimated the costs of CVO on their 36 bed rehabilitation unit to be $6,000 for a typical 3 week length of stay, or $78,000 per year for each patient monitored.

In a survey conducted in preparation for this study, 26 nurse and therapy leaders from 18 Traumatic Brain Injury Model Systems (TBIMS) and one additional acute rehabilitation center (average 120 TBI admits/year; range 30-226) found no agreed upon best practices for documenting the need for CVO or other less restrictive safety interventionsand no standardized CVO weaning protocols. Among the majority of centers, CVO decisions were based on interdisciplinary team communication with 73% of centers reassessing every 24 hours or more often. One therapist described it as “a lot of verbal report, not much objective data”. Documentation of possible need for CVO was most often per one or more of the following: narrative shift notes (64%), a “homegrown tool” (43%), and/or the ABS (36%). The ABS was seen as insufficient because while it measured agitation, it fell short of measuring other factors that justified CVO and its related staffing challenges and budgetary costs. It was also described as insensitive towards capturing more subtle changes in patient status, like improved orientation

and self-awareness, and often did not play a prominent role in the decision to initiate or stop CVO. Verbal behaviors, while disruptive, did not justify the cost of 1:1 nursing care. Similarly, repetitive behaviors, resistance to care, sudden mood changes, pulling at tubes, and short attention span did not predictably justify 1:1 care. There was consensus that specific patient behaviors outside those measured on the ABS greatly contributed to CVO decision making and, while there were reasons to measure and track agitation, as one survey respondent stated, "if every patient that was agitated was placed on CVO, we'd be broke". In regards to weaning from CVO, many centers generally followed the Riedel and Shaw 1997 recommendations[19] to engage in distancing, observing, coaching, shadowing, and informing once confusion diminished. The survey confirmed the suspicion that in many cases, once patients with TBI were placed on CVO, they were not weaned in a regimented or timely manner and that fear played a role according to 87% of respondents.

Pilot work at one of the TBIMS centers, the University of Pittsburgh Medical Center (UPMC), resulted in a new assessment tool based on the ABS. The UPMC tool incorporated additional items to enhance interdisciplinary team communication on patient safety. The scale also showed promise in identifying which patients needed CVO, which were ready to be weaned, and which did not require CVO but would benefit from other customary safety measures, such as, frequent checks or chair and bed alarms.

The study described here built on the work initiated by UPMC and another TBIMS center, Ohio State University, where the ABS was developed Study aims are consistent with national health care priorities to improve patient safety.[20] Ultimately this study also sought to provide a means to decrease variability in practice through development and dissemination of a standardized patient assessment protocol. And, to promote development of weaning protocols,

lead to more efficient use of resources, save cost, and help maximize patient safety. The specific aim of this study was to establish and provide initial validation of a measure for accurately determining the need for CVO of patients with TBI admitted to inpatient rehabilitation. An internally consistent measure of the need for CVO was developed and confirmed using Rasch analysis; the concurrent validity of the measure was assessed in relation to subjective clinical judgment recorded using the Pittsburgh Levels of Risk scale (LoR) and the current level of supervision as measured by the Supervision Rating Scale (SRS).

Method

IRB approval for the conducts of this study was received at each participating center.

Participants

134 individuals with moderate-severe TBI admitted to one of 7 inpatient brain injury rehabilitation units in the U.S. were participants in this study. Currently, all study sites are National Institute on Disability, Independent Living, and Rehabilitation Research (NIDILRR) funded Traumatic Brain Injury Model System centers, 6 of the 7 were at the time of the study.

Consecutive cases meeting the following inclusion/exclusion criteria were enrolled in the study at each site. Inclusion criteria: (1) diagnosis of moderate-severe TBI as per meeting one of the following criteria: initial Glasgow Coma Scale < 13 or post-traumatic amnesia duration > 24 hours or the presence of injury-related abnormalities on neuroimaging or admitted to inpatient rehabilitation with clinical diagnosis of moderate-severe TBI; (2) admission to an acute inpatient rehabilitation unit at a participating center; (3) age 18 years of age or greater. Exclusion criteria: (1) patients in a minimally conscious state (Ranchos Los Amigos Scale score of III or less) on admission; (2) patients on heavily sedating medications for agitation; (3) prisoners.

The sample included 44 (33%) women and 90 (67%) men with an average age of 46.8 years (SD = 21.05). All participants met TBI Model Systems criteria for moderate-severe TBI (inclusion criterion #1). Length of post-traumatic amnesia was available in 87 cases with a mean of 23.95 days (SD = 25.14 dys). An initial CT scan was recorded in 130 cases; 94% (122/130) were positive.

Measures

Constant Visual Observation Needs Assessment (CVONA) incorporates the original 14 items from the ABS. The ABS[22] is a reliable instrument for measuring agitation of individuals with TBI as well as residents in long-term care facilities experiencing dementia. Through a series of conference calls among this study's co-investigators and building on pilot information from the UPMC and prior research[12] on inpatient rehabilitation unit fall risk factors, an additional 15 items were added to the ABS by consensus for a total of 29 items in the preliminary CVONA scale. The CVONA scale captured not only obvious agitated behaviors, such as, restlessness, pulling at tubes, short attention span, explosive anger, and impulsivity, but other safety risks common to patients with TBI including impaired balance, incontinence, poor short term memory, inability to reliably use a call light or otherwise express needs, and lack of awareness of deficits. Each item on the CVONA was rated on a 4-point scale: 1=absent; 2=present to a slight degree (The behavior is present but does not prevent the conduct of other, contextually appropriate behavior; the individual may redirect spontaneously, or the continuation of the agitated/unsafe behavior does not disrupt appropriate behavior); 3=present to a moderate degree (The individual needs to be redirected from an agitated/unsafe behavior to an appropriate behavior, but benefits from such cueing); 4=present to an extreme degree (The individual is not able to engage in appropriate/safe behavior even when external cueing or redirection is

provided). The scale included 11 items describing potentially unsafe physical activities, 10 describing cognitive/communication impairments, and 8 describing problematic behavioral/emotional features. The final version of the CVONA is available on-line as supplementary material.

As we stated in the introduction to this paper, there is no generally agreed upon or gold standard method or procedure for assessing CVO. For this reason, the validity of the CVONA could only be assessed in comparison to concurrent measures that also appear related to the need for CVO. We chose two measures to assess the concurrent validity of the CVONA: the University of Pittsburgh Levels of Risk rating that represents subjective clinical judgment of the need for CVO, and the Supervision Rating Scale which is a rating of the degree of supervision that is currently provided to a patient. Both measures are described in greater detail below.

Levels of Risk (LorR). The UPMC pilot tool identifies four levels of risk for patients with TBI on an acute inpatient rehabilitation unit. In broad terms, the levels range from 1 = no safety risk, no need for CVO to 4 = extreme safety risk, definite need for CVO. The LoR helps direct the need for CVO or other less restrictive safety interventions. A copy of the LoR is available on-line as supplementary material.

Supervision Rating Scale (SRS)[21] measures the level of supervision that a patient/participant receives from caregivers. The SRS rates level of supervision on a 13-point ordinal scale that can optionally be grouped into five ranked categories (Independent, Overnight Supervision, Part-Time Supervision, Full-Time Indirect Supervision, and Full-Time Direct Supervision). Because all participants in the current project were rehabilitation inpatients, only the ratings for “Full-Time Indirect Supervision” (levels 8-9) and “Full-Time Direct Supervision”

(levels 10-13) were used. Ratings are based on the level of supervision currently received, not on how much supervision a participant is judged or predicted to need.

Procedures

This was a prospective, multi-site observational study designed for rating scale development. Participating brain rehabilitation centers were: Baylor Institute for Rehabilitation, Dallas, TX; Mayo Clinic, Rochester, MN; MossRehab, Philadelphia, PA; Mount Sinai Rehabilitation Center, New York, NY; Ohio State University/Dodd Rehabilitation, Columbus, OH; Rehabilitation Hospital of Indiana, Indianapolis, IN; and University of Pittsburgh Medical Center, Pittsburgh, PA.

Prior to commencement of participant recruitment at each site, staff nurse and independent (therapists or co-investigators) raters underwent training that included study overview of recruitment protocols, inclusion/exclusion criteria, timing of assessments, and orientation to and practice with study measurement tools (LoR and SRS rated by nurses; CVONA rated by therapists and co-investigators). Training emphasized that the study was <u>not</u> intended to affect current nursing practice or local standards of care for assessing patient safety status, determining frequency of safety assessments, related documentation practices, weaning protocols, or assigning related interventions based on assessed need. Study investigators at each site were asked to identify a consecutive series of 20 adults with TBI who met study inclusion criteria. Only new admissions were considered.

Trained staff nurses (5-6) from each participating center assigned both the LoR and the SRS score for identified participants upon admission to the inpatient rehabilitation unit. Clinical judgment, review of the medical record, and discussion with staff from the sending hospital unit were used for assigning these scores. Admission scores were documented twice, on both the day and evening or night shift, to capture variability and because nursing staff interact with patients

24 hours per day. Both of these admission scores were completed within 24 hours of the patient entering the rehabilitation unit.

An independent rater from a pool of 5-6 therapists and local co-investigators administered the proposed CVONA for the same identified participants. This initial rating was completed within 24 hours of admission, on the day shift, as this aligned with their schedule and usual contact with the patient. The independent raters used direct observation and information from the medical record to complete the CVONA. Throughout the study, those making CVONA ratings did not discuss their ratings with the nurses who rated the patient on the LoR and SRS. As mentioned above, all staff participating in this study were instructed that ratings made on the measures were not to be used to plan or modify clinical care. Consequently all ratings were maintained as confidential research data and not recorded in the medical record. Hence, those making CVONA ratings were blind to nurses' ratings on the LoR and SRS and vice-versa.

Subsequently, nurses rated the LoR and SRS on every participant twice per day, once on the day shift and again on the evening or night shift, depending on the patient's sleep/wake patterns. Ratings were spaced at least 8 hours apart on three separate days according to the following schedule: (1) within 2-3 days of admission, (2) within 5-6 days of admission, and (3) within 8-9 days of admission. Independent raters completed the CVONA for the same participants, once during daytime hours, adhering to the same schedule: (1) within 2-3 days of admission, (2) within 5-6 days of admission, and (3) within 8-9 days of admission.

Data Analysis

Primarily to assess item viability, preliminary CVONA item data obtained at each time point (admission, and 2-3 days, 5-6 days, and 8-9 days post-admission) were examined in 4

separate Rasch analyses. In each of these analyses, items were eliminated from the pool until Infit and Outfit statistics for all items were within acceptable limits (.6 to 1.4).

Following these initial analyses, two potential CVONA measures were assembled. CVONA-I included only items that showed good fit to the underlying construct (i.e., Infit and Outfit >.6 and <1.4). The CVONA-II included CVONA-I items plus 5 additional items that demonstrated good fit on 2 or 3 of the 4 Rasch analyses.

Receiver operating characteristic (ROC), sensitivity and specificity of the CVONA-I and CVONA-II were then evaluated relative to independent assessment of need for visual observation (LoR) and supervision (SRS).

Results

Rasch analyses by evaluation time points

Separate Rasch analyses were conducted on data obtained at each of the four evaluation time points. The number of items meeting a priori fit criteria, i.e., both Infit and Outfit >.6 and <1.40 varied from 8 to 16 across the four time points. After eliminating misfitting items, Rasch metrics and Cronbach's alpha indicated acceptable internal consistency and construct validity for the measure at each time point although the number of items with acceptable fit varied across time points (see Table 1).

Insert Table 1 about here

CVONA-I and CVONA-II

CVONA-I was assembled from 8 items that met fit criteria at all evaluation time points. CVONA-II consisted of CVONA-I plus an additional 5 items that met fit criteria at 2 or 3

evaluation time points (see Table 2). Table 3 shows that internal consistency and construct validity for these measures was satisfactory at each evaluation time point.

Insert Tables 2 & 3 about here

ROC analyses of CVONA-I and CVONA-II

LoR and SRS served as concurrent measures for assessing the validity of CVONA-I and CVONA-II. A participant was considered to require CVO if one or both raters at a given time point rated the participant 3 or 4 on the LoR. A rating on the SRS of 10 or higher was considered as a secondary criterion for the need for constant visual observation.
Across the 4 evaluation time points, 2 ratings (daily and evening or night) were obtained at each time point on the LoR and on the SRS in 79-90% of the cases. In cases in which two ratings were available for the same participant at the same time point, the two raters agreed that the participant met the criterion for CVO on the LoR (score of 3 or 4) in 90-95% of cases. Raters agreed on the SRS criterion (score $\geq$ 10) in 93-96% of the cases. Agreement between the two dichotomous concurrent measures (LOR $\geq$ 3, SRS $\geq$ 10) ranged from 90-93% across the 4 evaluation time points.

Tables 5 and 6 show results of the ROC analyses of CVONA-I and CVONA-II at each time point for the two dichotomous concurrent measures (LoR, SRS). Both the CVONA-I and CVONA-II were significantly associated with thesemeasures, as indicated by area under the curve (AUC) statistics. (A chance relationship between the CVONA measures and criterion measures would result in an AUC of .50) Sensitivity and specificity of the CVONA measures were examined. Because false negatives were of primary concern, i.e., indicating that someone

is NOT a safety risk when in fact the risk is significant, a cut off score was determined that resulted in approximately 90% sensitivity. Sensitivity at this level indicates a concomitantly low false negative rate, i.e., <10%. Cutoff scores and associated sensitivity values are displayed in Tables 4 and 5 as is the false positive rate (1-specificity).

Insert Tables 4 & 5 about here

DISCUSSION

Creating and maintaining a culture of safety for rehabilitation inpatients with TBI is a "formidable undertaking," and the daily considerations that must be given to patient safety are some of the most difficult and demanding in terms of staff numbers and time.[23] Though many safety interventions may be utilized, minimizing the use of physical restraints is an overarching goal. As such, the use of CVO has become increasingly prevalent and possibly overutilized. Unfortunately, extensive use of CVO can impose significant cost to health care organizations due to increased staffing, the inconsistency in which least-restrictive methods are employed, and a lack of standardized protocols. This study aimed to develop a tool based on the ABS to better guide decision-making regarding initiation and weaning of CVO.

The CVONA is a measure that assesses cognitive/communication, behavioral/emotional, and physical activities that may jeopardize safety. Activities and behaviors that potentially put the patient at risk appear to represent the construct that unifies items on the linear Rasch dimension. Both the CVONA-I and CVONA-II show acceptable internal reliability and consistency when administered at various times during inpatient rehabilitation. Associations with other indicators of need for CVO provide evidence of concurrent validity. However, when

compared to these other indicators, CVONA measures show a high false positive rate in the context of good sensitivity. Of course the criterion indicators (LoR and SRS) also are not perfectly reliable and valid. Rater agreement on these measures was high but less than 100%. Furthermore, in current practice, there is no generally acceptable protocol to determine CVO. After transfer to inpatient rehabilitation, patients may remain on CVO (or not) primarily because they were on CVO before transfer and remain on CVO (or not) for prolonged periods of time based on this initial decision. Indicators like LoR and SRS reflect the patient's current status but do not necessarily reflect actual need for CVO. In addition, completion of the CVONA required increased attention to patient behaviors and may have identified patients who in fact needed CVO but were not currently receiving it, that is, some false positives may not have been false.

While psychometric properties of the shorter (CVONA-I) and longer (CVONA-II) versions of this measure are similar, the cutoff scores for the longer version are more stable over time (see Table 4). The additional items in this longer version most likely support this stability and its use is recommended over the shorter version, particularly in future research. Most of the items that survived initial Rasch analysis reflected the patients' cognitive status or behavioral self-control rather than physical/motor features like pulling at tubes or balance. It may be that these cognitive and behavioral features were more pervasive and hence more easily and reliably observed than physical behaviors which occur more intermittently. In any case, some of the items that were eliminated in this initial psychometric analysis but have been traditional red flags for high risk patients, e.g., pulling at tubes/restraints, wandering, poor/unpredictable balance, and inability to express needs, may also merit further evaluation in future studies.

Limitations

A true gold standard is not available to evaluate a new metric like the CVONA. While the absence of a gold standard challenges accurate estimation of the sensitivity and specificity of a measure, this initial evaluation indicates a high false positive rate which may lead to unnecessary and costly application of CVO in some cases. Although the current versions of the CVONA fit a linear Rasch model, some items that did not fit the model may be significant indicators of the need for CVO, as mentioned previously. Our sample size did not allow for definitive examination of the dimensionality of the CVONA and it is possible that a precise measure of CVONA requires a multi-dimensional scale or scales. Thus, despite a relatively substantial number of participants recruited across multiple institutions in this study, additional studies with large, representative samples are needed to further develop a measure like CVONA and confirm its validity and the generalizability of its use.

Conclusions

Our results indicate that the CVONA had adequate sensitivity for identification of behaviors requiring CVO. The high false positive rate suggests that CVO may be inappropriately recommended by the CVONA for some patients who do not require such intervention (at a potential cost to the organization). However, in light of the unavailability of a true gold standard criterion measure and the possibility that some false positive are in fact true positives, this cost must be considered versus the benefit in risk mitigation associated with false negatives.

As these results suggest, the CVONA may be considered as a complementary objective metric to improve consistency in clinical judgment regarding the need for CVO, but should not be considered prescriptive. In other words, while the CVONA should not be considered as a substitute for good clinical judgment, the use of such an objective measure is expected to help

standardize the assessment of behaviors that may jeopardize safety. In this way, its use may improve the consistency of such assessments particularly across time and changes in staff who are responsible for making clinical decisions about the need for CVO. Although this preliminary evidence suggests that the CVONA may adequately identify need for CVO, further prospective studies are necessary to validate its use for the identification of at-risk patients. A more definitive test of the validity and usefulness of the CVONA will require additional prospective study to determine whether its use results in fewer adverse events (such as, falls, potentially harmful behaviors to self or others) as well as more prudent and cost-effect use of CVO than current practice.

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Table 1. Rasch analyses by evaluation time points				
	Admission	Days 2-3	Days 5-6	Days 8-9
Number of items with acceptable fit	16	8	13	13
Person Separation/Reliability	.86/2.53	.86/2.48	.87/2.60	.88/2.72
Item Separation/Reliability	.99/8.14	.99/10.64	.99/8.55	.99/8.32
Cronbach's Alpha	.91	.80	.91	.93

Table 2. CVONA-I and CVONA-II items after pruning through Rasch analyses
CVONA-I Items
Cognitive/Communication
• Short attention span, easily distractible, inability to concentrate*
• Confused, disoriented
• Poor or no short term memory
• Lack of awareness of deficits
Behavioral/Emotional
• Impulsive, impatient, low tolerance for pain or frustration*
• Sudden changes of mood*
• Uncooperative, resistant to care, demanding*
• Explosive and/or unpredictable anger*
Additional items for CVONA-II
Physical
• Self-abusiveness, physical and/or verbal*
Cognitive/Communication
• Rapid, loud, or excessive talking*
• No or inconsistent ability to use call light to summon help
• Perseveration
Behavioral/Emotional
• Repetitive behaviors, motor and/or verbal*

*Agitated Behavior Scale items

Table 3. Psychometrics for CVONA-I and CVONA-II by evaluation time point

	Admission		Days 2-3		Days 5-6		Days 8-9	
	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II
Person Separation/Reliability	.85/2.43	.87/2.54	.86/2.48	.85/2.37	.86/2.44	.87/2.56	.88/2.77	.88/2.65
Item Separation/Reliability	.99/10.30	.99/8.67	.99/10.63	.98/7.50	.99/9.78	.99/8.31	.99/9.80	.99/8.48
Cronbach's Alpha	.87	.90	.88	.90	.89	.92	.91	.93

Table 4. ROC results for LOR criterion

	Admission (n=133)		Days 2-3 (n=134)		Days 5-6 (n=134)		Days 8-9 (n=126)	
	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II
Area Under the Curve (AUC)	.832	.831	.765	.766	.769	.768	.824	.838
P	<.001	<.001	.047	.047	.041	.042	.037	.037
CVO cutoff	≥ 12	≥ 17	≥ 11	≥ 16	≥ 10	≥ 16	≥ 9	≥ 16
Sensitivity	89%	89%	93%	93%	90%	91%	92%	93%
False positive rate (1-specificity)	29%	33%	48%	46%	50%	55%	56%	46%

Table 5. ROC results for SRS criterion

	Admission (n=133)		Days 2-3 (n=134)		Days 5-6 (n=134)		Days 8-9 (n=126)	
	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II	CVONA-I	CVONA-II
Area Under the Curve (AUC)	.805	.803	.746	.714	.769	.776	.799	.813
P	<.001	<.001	.047	.049	.043	.043	.041	.040
CVO cutoff	≥ 11	≥ 16	≥ 11	≥ 16	≥ 10	≥ 16	≥ 9	≥ 16
Sensitivity	92%	90%	92%	92%	89%	91%	91%	89%
False positive rate (1-specificity)	45%	45%	52%	50%	51%	53%	55%	47%

Constant Visual Observation Needs Assessment (CVONA)

Center Number: _____ Subject Number: _____
Rater Initials: _____Date: _____ Time: _____

Scoring:
1 = absent: the behavior is not present
2 = present to a slight degree: the behavior is present but does not prevent the conduct of other, contextually appropriate behavior. (The individual may redirect spontaneously, or the continuation of the agitated/unsafe behavior does not disrupt appropriate behavior.)
3 = present to a moderate degree: the individual needs to be redirected from an agitated/unsafe behavior to an appropriate behavior, but benefits from such cueing.
4 = present to an extreme degree: the individual is not able to engage in appropriate/safe behavior even when external cueing or redirection is provided.

CIRCLE SCORE. DO NOT LEAVE BLANKS (Note: Bold = 14 ABS items)

Physical				
Pulling at tubes, restraints, etc.	1	2	3	4
Rocking, rubbing, moaning or other self stimulating behavior	1	2	3	4
Self-abusiveness, physical and/or verbal	1	2	3	4
Wandering from treatment areas	1	2	3	4
Restlessness, pacing, excessive movement	1	2	3	4
Poor/unpredictable balance	1	2	3	4
History of falls < 30 days. (1 if no known history /4 if any falls within last 30 days)	1	2	3	4
History of elopement	1	2	3	4
Dizziness	1	2	3	4
Incontinence	1	2	3	4
Inability to toilet self	1	2	3	4
Cognitive/Communication				
Short attention span, easily distractible, inability to concentrate	1	2	3	4
Rapid, loud, or excessive talking	1	2	3	4
Confused, disoriented	1	2	3	4
Delusional and/or hallucinating	1	2	3	4
Poor or no short term memory	1	2	3	4
Lack of awareness of deficits	1	2	3	4
No or inconsistent ability to use call light to summon help	1	2	3	4
Perseveration	1	2	3	4
Confabulation	1	2	3	4
Aphasia, inability to express needs	1	2	3	4
Behavioral/Emotional				
Impulsive, impatient, low tolerance for pain or frustration	1	2	3	4
Sudden changes of mood	1	2	3	4
Uncooperative, resistant to care, demanding	1	2	3	4
Repetitive behaviors, motor and/or verbal	1	2	3	4
Easily initiated or excessive crying and/or laughter	1	2	3	4
Explosive and/or unpredictable anger	1	2	3	4
Violent and/or threatening toward people or property	1	2	3	4
History of aggression	1	2	3	4

Center Number: _____ Subject Number: _____
Rater Initials: _____Date: _____ Time: _____

Need for Constant Visual Observation

SUPERVISION RATING SCALE (SRS)

Independent
01=Alone, Independent
02=Unsupervised at night, sometimes during day

Overnight supervision
03=Supervised only at night

Part Time supervision
04=Supervised at night and selected day times.
05=Supervised at night and part-time during day; not supervised during working hours (full time)
06=Supervised at night and most of day except for few unsupervised hours.
07=Only unsupervised for periods less than one hour at a time.

Full-time indirect supervision
08=Full time indirect supervision; does not check more than once every 30 minutes
09=Same as 08, and requires overnight safety precautions (lock, etc.)

Full time direct supervision
10=Full time direct supervision; checked more than once every thirty minutes
11=Full time direct supervision in confined, controlled setting.
12=Same as 11, but with constant visual watch
13=Person is in physical restraints.

LEVEL of RISK (LoR)

I -No known safety risk (no need for CVO, standard nursing staffing assignment
II -Slight safety risk (no need for CVO, use interventions such as bed and chair alarms, specialized beds, frequent room checks, Secure Care/Wanderguard system)
III -High safety risk (probable need for CVO, daily interdisciplinary team review of need for CVO, implement Level II safety measures, consider use of more restrictive measures including approved restraints
IV-Extreme safety risk (definite need for CVO; daily interdisciplinary team review of ongoing need for CVO, implement Level II safety measures, consider use of more restrictive measures including approved restraints