



## The Reliability and Validity of the Alcohol Intoxication Scale

2013 NDNQI Conference

Tina Volz, PhD, RN



Edgewood



Covington



Grant County

better together



Ft. Thomas



Florence

In 2008 these three facilities joined St. Elizabeth Edgewood/Covington/Grant

better together



Falmouth



## St. Elizabeth Healthcare (SEH)

- Founded in 1861 St. Elizabeth Healthcare operates six facilities throughout Northern Kentucky—Covington, Edgewood, Falmouth, Florence, Fort Thomas, and Grant.
- Edgewood/Covington/Grant was the first Magnet® designated facility in the Greater Cincinnati/Northern Kentucky area (2006) and was re-designated in 2010
- Merged with Ft. Thomas and Florence in 2008
- Almost 1,200 licensed beds, more than 7,300 associates including St. Elizabeth Physicians

better together

## SEH

- In November 2012, SEH became a member of the Mayo Clinic Care Network
- “The Mayo Clinic Care Network is a network of like-minded organizations which share a common commitment to improving the delivery of health care in their communities through high-quality, data-driven, evidence-based medical care” (Mayo website)
- SEH is one of only 11 facilities and one cancer care facility to become part of the Mayo Clinic Care Network

better together



## The Reliability and Validity of the Alcohol Intoxication Scale (AIS)

### Problem/Background

- WHO: Estimated 2 billion people who drink alcohol, and 76.3 million with diagnosable alcohol use disorders
- Alcohol is contributing factor in traumatic injuries as well as chronic conditions
- 21-34% of ED visits are alcohol-related
- EDs are faced with large numbers of patients admitted with alcohol intoxication who need referral to an inpatient behavioral health (BH) unit

better together

## Problem (cont.)

- Blood alcohol level (BAL) must be below a certain level before transfer to the BH unit
- Repeated blood draws to determine BAL
- Frustration in delay to transfer due to BAL
- No correlation between BAL and patient symptoms

better together

## Solution

- BAL might not be best indicator of intoxication level
- The ED and BH units worked together to develop a behavioral-based alcohol intoxication scale (AIS)

better together

## Methods

- ROL: No behaviorally based instrument found to assess intoxication for transfer
- Majority of assessments found are used to assess whether patients have alcohol abuse issues

better together

*Behavioral Classification for Y91 codes and Suggested Correspondence between Y90 and Y91*

Y91.0	<b>Mild alcohol intoxication:</b> smell of alcohol on breath, slight behavioral disturbance in functions and responses, or slight difficulty in co-ordination <b>Breath Alcohol Concentration: 0.060-0.099</b>
Y91.1	<b>Moderate alcohol intoxication:</b> smell of alcohol on breath, moderate behavioral disturbance in functions and responses, or moderate difficulty in co-ordination <b>Breath Alcohol Concentration: 0.100-0.199</b>
Y91.2	<b>Severe alcohol intoxication:</b> severe disturbance in functions and responses, severe difficulty in co-ordination, or impaired ability to co-operate <b>Breath Alcohol Concentration: 0.200-0.299</b>
Y91.3	<b>Very severe alcohol intoxication:</b> very severe disturbance in functions and responses, very severe difficulty in co-ordination, or loss of ability to co-operate <b>Breath Alcohol Concentration: 0.300-.....</b>
Y91.9	<b>Suspected alcohol involvement (NOS: not otherwise specified)</b>

better together

## AIS Development

- ED and BH physicians
- Nursing Directors of ED and BH
- Nurse Managers from ED and BH
- Reviewed by HR
- Informal content validity: all were in agreement
- The tool was piloted and then went system-wide

better together

## St. Elizabeth Healthcare AIS

- I. Alertness/ Orientation
  - A. Alert and oriented (0 pt)
  - B. Lethargic, but oriented (1 pt)
  - C. Disoriented, arouses to verbal command (2 pts)
  - D. Stuporous, poorly responsive to verbal/painful stimuli (3 pts)
- II. Gait (e.g. pt should walk 10 feet in a straight line)
  - A. Steady gait (0 pt)
  - B. Minor incoordination/ staggering (1 pt)
  - C. Moderate ataxia (2pts)
  - D. Unable to sit/stand without assistance (3 pts)

better together

## AIS (cont.)



III. Speech (e.g. have patient repeat "Today is a bright and sunny day")

- A. Clear speech (0 pt)
- B. Mildly slurred speech (1 pt)
- C. Moderately slurred speech (2 pts)
- D. Severely slurred/incoherent speech (3 pts)

IV. Agitation

- A. Calm/cooperative (0 pt)
- B. Anxious or mildly disinhibited (1 pt)
- C. Irritable/ verbally abusive (2 pts)
- D. Verbally threatening self/ others (3 pts)
- E. Physically combative (4 pts)

better together

## AIS (cont.)



V. Physical Assessment

- A. VS stable/negative physician assessment (0 pt)
- B. Mild tremors/restless/ loss of fine motor skills (1pt)
- C. Blurred vision/ nausea/ vomiting (2 pts)
- D. Unstable vitals/ double vision (3 pts)
- E. Bowel/bladder incontinence/ respiratory suppression (4 pts)

**A score of 11 or greater means the patient remains in the ED. Transfer to BH, TCU, or Med/Surg will not occur until a score of less than 11 is achieved.**

**ICU can accept admissions that score greater than 11**

better together

## Evaluation of tool



- Is the AIS reliable?
- Does the AIS have criterion-related validity?
- Power analysis: 75 needed for reliability study and 75 for the validity study

better together

## Reliability of the AIS



- MD and RN to assess the patient at the same time and record responses separately
- Not always done at the same time- used a 30 minute time-frame
- Final sample size was 72
- Krippendorff's Alpha stat was computed to assess inter-rater reliability
- $\alpha = 0.9396$

better together

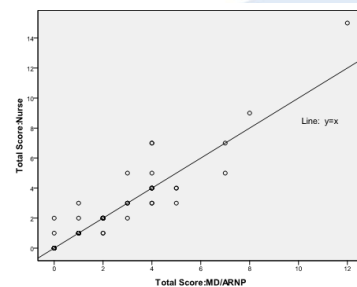
## Subscales



	Krippendorff's Alpha
Alertness/Orientation	.8559
Gait	.8803
Speech	.7829
Agitation	.8712
Physical Assessment	.5197
Total Score	.9396

better together

## Subscales



better together



## Physical Assessment

While the Krippendorff's Alpha was lower for the physical assessment score (0.5197), 67 of the 72 pairs had the same score, and only 5 pairs did not agree. It is unclear why this subscale did not have a higher alpha than what was calculated in the data analysis. It was surmised that as there was little variability in the data, a few scores skewed the results.

better together



## Reliability (cont.)

A Bland-Altman test was calculated to measure the agreement of the two scores

- Data can have a high correlation, but can have poor agreement
- $r$  measures the strength of a relation between two variables, not the agreement between them.
- We have perfect agreement only if the points lie along the line of equality, but we will have perfect correlation if the points lie along any straight line.
- Results of the Bland/Altman analysis showed that the average difference between the two measurements was 0.1111
- 53/72 pairs were the same, 19 had different total scores

better together



## Validity

- N = 87 charts were reviewed of patients that were admitted to BH
- Assessed for medical stability
  - No RRT called
  - No Code Blues called
  - No patients transferred to a medical unit within 24 hours
  - Only medical intervention was treatment for one critically low blood glucose level
  - One patient had some unstable vital signs in BH, but did not have to be transferred off of the unit

better together



## Benefits

- Transfer of patients in a timelier manner- increase throughput
- Decreased blood draws-nurse/patient satisfier
  - Increase patient satisfaction
  - Decrease chance of needlestick injury to staff
  - Decrease cost of test

better together



## Discussion

- Only had arrival time in BH on 28 patients
  - Arrival time was an average 261 minutes
  - Some BAL might have been below 200 on arrival anyway
- Used by forensic nurses to consent patients for sexual assault exam
- Used by local police and firemen to assess individuals to see if they are safe medically to transfer to jail

better together



## Discussion

- Cut-off level was chosen arbitrarily- need to assess if it is appropriate
- Future studies:
  - Need to look at following patients with all different scores for outcomes
  - Sensitivity/specificity of test to determine whether cut off point is appropriate

better together



## Contact Information

Tina Volz, PhD, RN  
Director, Nursing Research  
St. Elizabeth Healthcare  
1 Medical Village Drive  
Edgewood, Kentucky 41017

[Tina.Volz@stelizabeth.com](mailto:Tina.Volz@stelizabeth.com)  
859-301-5753

better together