

BACKGROUND & OBJECTIVE

- Sedation is integral to management of patients receiving mechanical ventilation in the intensive care unit (ICU).
- Clinical Practice Guidelines recommend targeting light level of sedation, given strong evidence for harmful outcomes associated with deep sedation.
- The Richmond Agitation-Sedation Scale (RASS) is a 10-level scale validated in the early 2000s as a reliable bedside tool for assessing the level of sedation. However, according to recent reports (expand), RASS may be susceptible to measurement bias and inaccurate documentation.
- This study aimed to evaluate the accuracy of RASS assessments performed in the ICU with the hypothesis that bedside nurses may underestimate depth of sedation relative to trained assessors.

Figure 2. EPIC Flowsheet for RASS Documentation

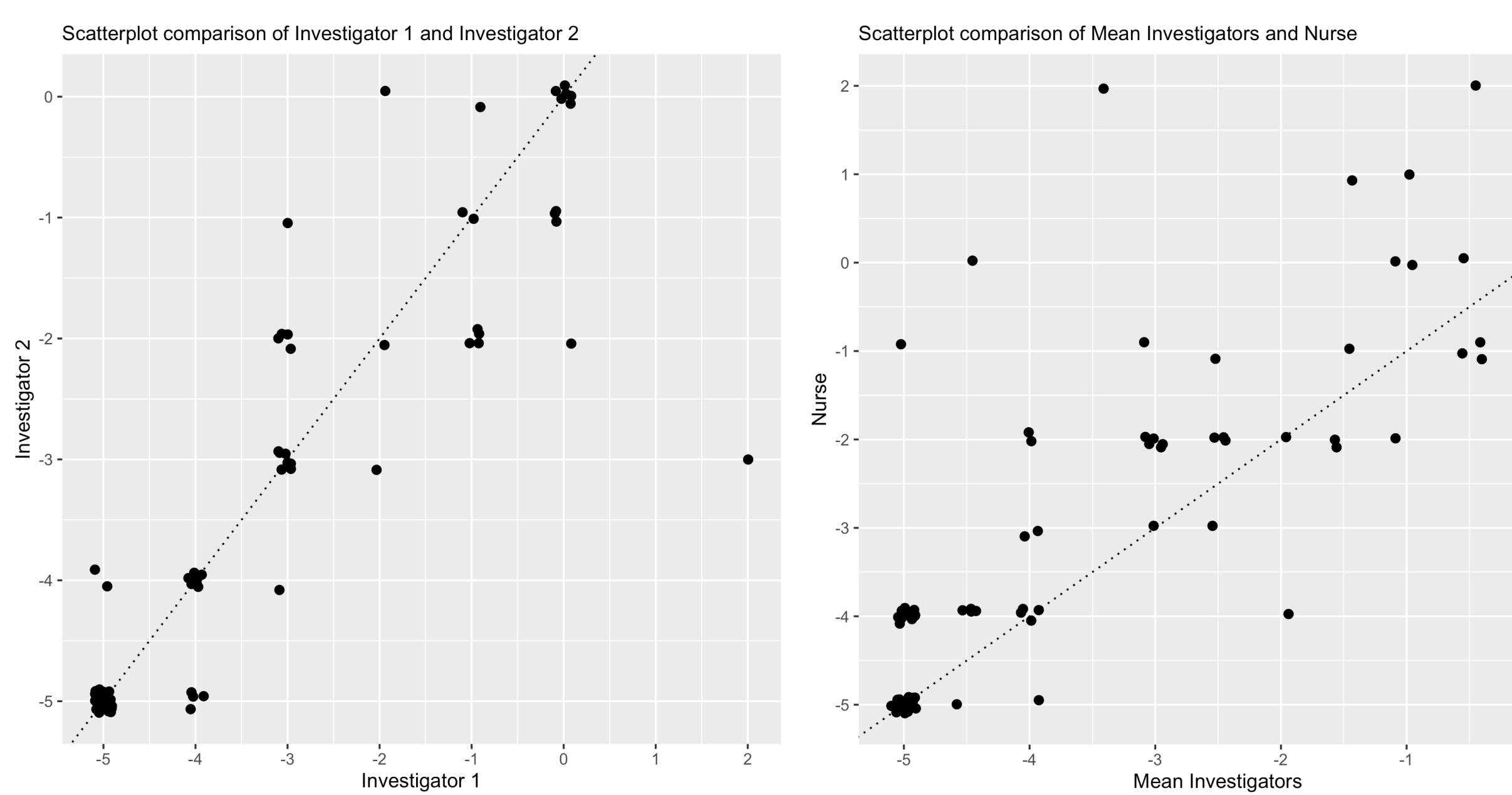
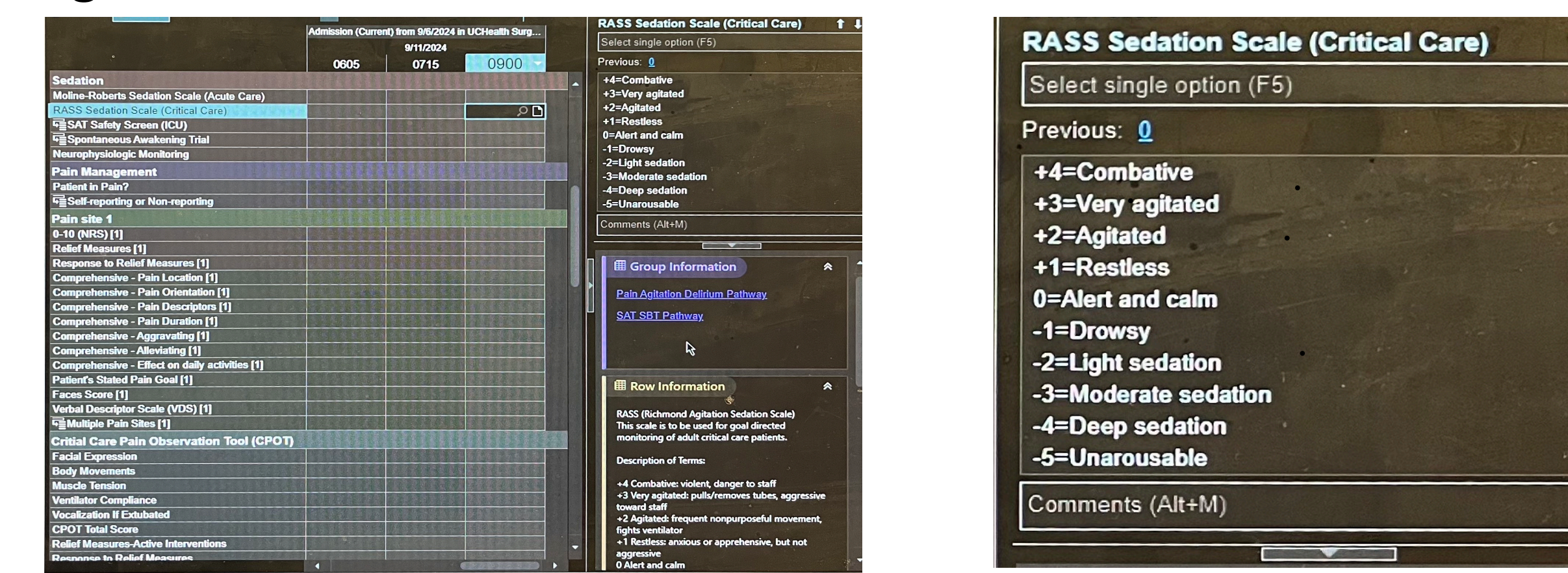


Figure 3: Scatterplot comparison of RASS Scoring across both ICUs, between investigators 1 & 2 (left), and between Mean Investigators & Nurse (right): Across n=79 patient encounters analyzed, the inter-rater reliability of RASS assessments among the four trained assessors (two physicians and two medical students) was good (ICC, 0.891; 95% confidence interval [CI], 0.836-0.929; p<0.001. Inter-rater reliability between pair of trained assessors (mean score) and bedside nurses was lower (ICC, 0.773; 95% CI, 0.667-0.849; p<0.001).

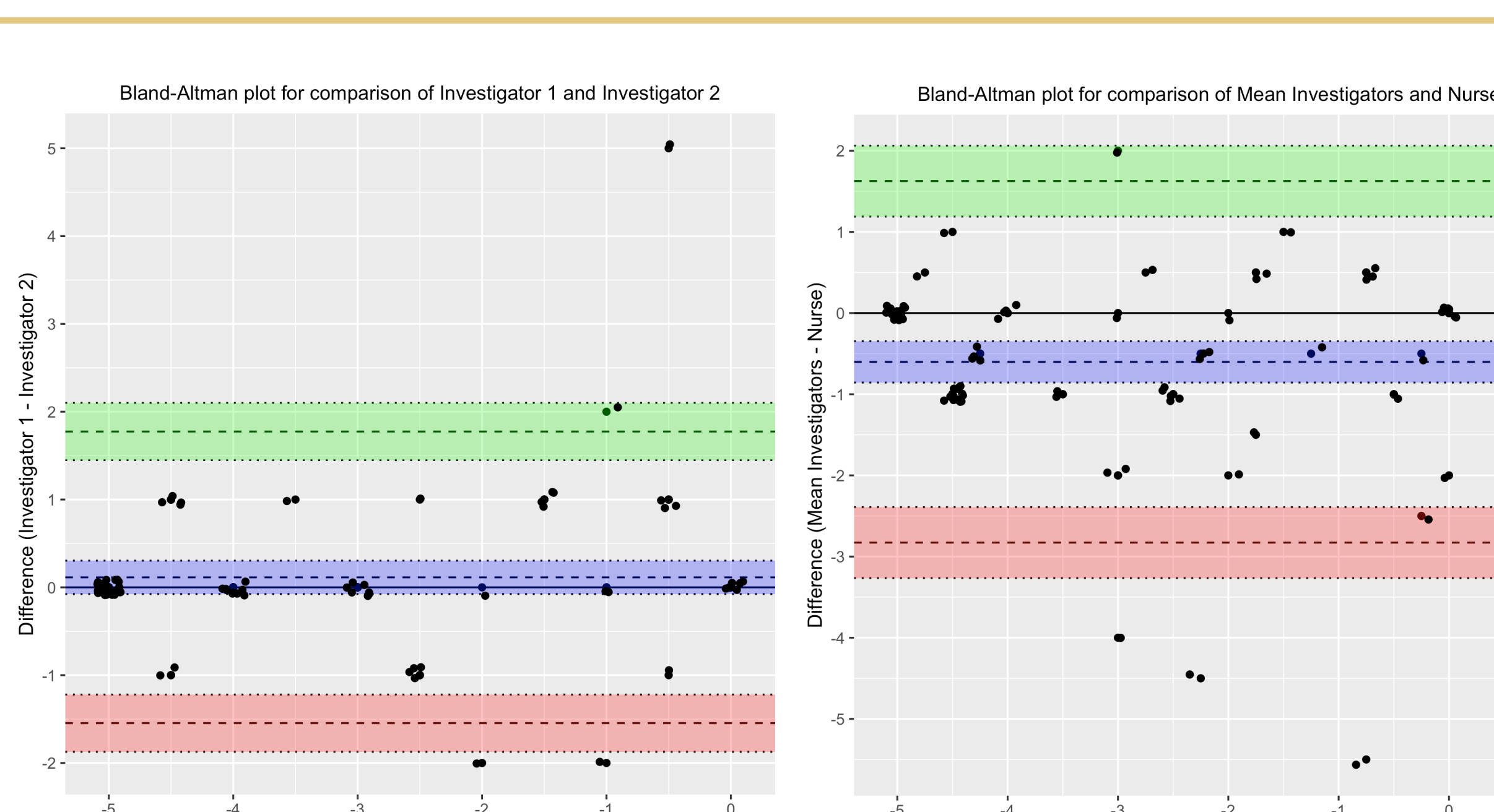


Figure 4 : Bland-Altman Plot comparison of RASS Scoring across both ICUs, between investigators 1 & 2 (left), and between Mean Investigators & Nurse (right): RASS assessments among the four trained assessors was with a negligible bias of 0.114 between the mean differences (p=0.236). However, between paired trained assessors (mean score) and bedside nurses, there was a statistically significant bias of -0.601 (p<0.001). Mean bias depicted by dotted line in blue section of plot.

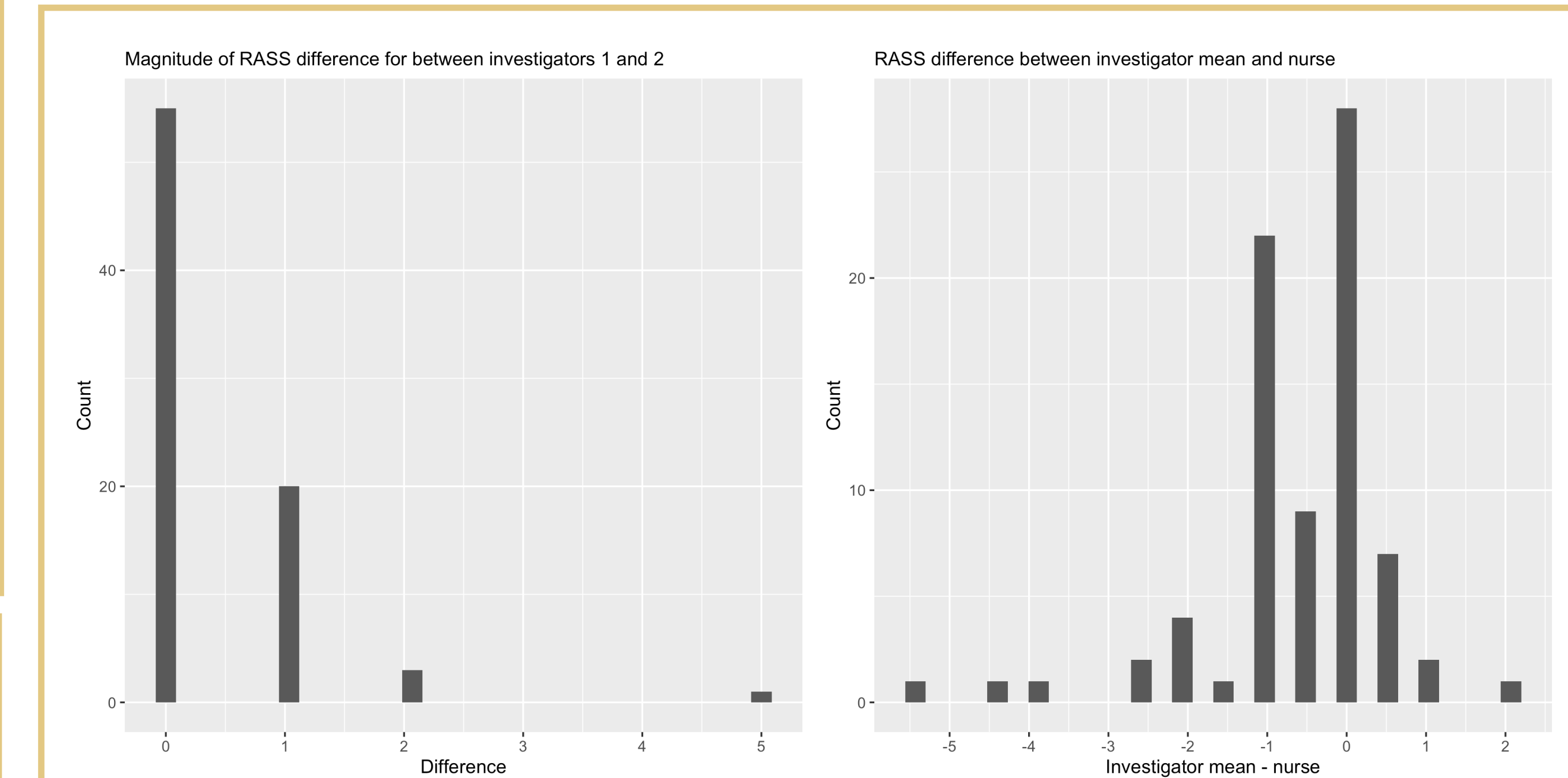


Figure 5: Histogram plots of magnitude of RASS Score difference across both ICUs, between investigators 1 & 2 (left), and between Mean Investigators & Nurse (right): The proportion of times the nurses' RASS score was higher than that of either investigator was 0.38 (CI, 0.28-0.49).

SUMMARY & CONCLUSIONS

- A total of 34 patients (54.8%) were mechanically ventilated for acute respiratory failure, 13 patients (21%) for altered mental status, 6 patients (9.7%) for emergency procedures, 6 (9.7%) patients for postoperative respiratory failure, and 3 (4.8%) patients for hemodynamic instability.
- Nursing assessments were more likely to underestimate the sedation depth compared to trained assessors, albeit only by less than one level (-0.601) on average.
- Our findings support the RASS as a reliable and valid sedation assessment tool. However, periodic training may be necessary.

FUTURE DIRECTIONS

- Possible interventions include incorporating into EPIC RASS flowsheet documentation to pop-up with the specific criterion of each RASS level (i.e drop-down bar)
- Intervention via in-person training with both nursing and advanced providers to facilitate discussion and increased comfortability in more precise assessment.

REFERENCES



Acknowledgments:

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Figure 1. Richmond Agitation & Sedation Scale (RASS)

Scale	Label	Description	Assessor Action
(+4)	Combative	Combative, violent, immediate danger to staff	Observation
(+3)	Very Agitated	Pulls to remove tubes or catheters; aggressive	Observation
(+2)	Agitated	Frequent non-purposeful movement, fights ventilator	Observation
(+1)	Restless	Anxious, apprehensive, movements not aggressive	Observation
0	Alert & Calm	Spontaneously pays attention to caregiver	Observation
(-1)	Drowsy	Not fully alert, but has sustained awakening to voice (eye opening & contact >10 sec)	Voice
(-2)	Light Sedation	Briefly awakens to voice (eyes open & contact <10 sec)	Voice
(-3)	Moderate Sedation	Movement or eye opening to voice (no eye contact)	Voice
(-4)	Deep Sedation	No response to voice, but movement or eye opening to physical stimulation	Touch
(-5)	Un-arousable	No response to voice or physical stimulation	Touch

METHODS

- Prospective cohort study utilizing convenient sampling to enroll adult patients who were mechanically ventilated with an endotracheal tube in the cardiothoracic and surgical ICUs at the University of Colorado Hospital between May 2024 to July 2024
- Two phases of study, 1st phase: members of the investigator team receiving lectures, bedside training on RASS assessment from a board-certified intensivist with a final 10 question video-based RASS assessment quiz with 100% accuracy as well as in-vivo RASS assessments, with three consecutive absolute agreement.
- 2nd Phase: assessor and nurse independently recorded their RASS assessments on a secure online server. Any intravenous sedation medications were documented.
- Intraclass correlation coefficient (ICC) based on a mean-rating (k = 2), absolute-agreement, 2-way mixed-effects model, was used to evaluate inter-rater agreement. Bland-Altman analysis was used to evaluate measurement biases.