Assessing an Interdisciplinary Approach to the Diagnosis and Treatment of Agitation in Traumatic Brain Injured Patients: Implications for Community and Public Health

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Introduction

This study utilizes an innovative 'heatmapping' methodology to elucidate the 'scope of practice' boundaries that determine how interdisciplinary teams diagnose and treat agitation in patients with Traumatic Brain Injury (TBI) in the acute inpatient rehabilitative setting.

Agitation = pathologically disruptive states of irritability, restlessness, and tension; states of aggression during the period of post-traumatic amnesia, in the absence of other physical, medical or psychiatric causes [1]

Agitation in patients with Traumatic Brain Injury (TBI):
- … predisposes patients to negative health outcomes
- … creates risk for patients, families, and care providers
- … interferes with effective therapies and care management progress
- … occurs in 11-77% of TBI patients [2, 3]

Issue: TBI patients are cared for by interdisciplinary teams comprised of members whose perceptions and competencies differ. Assessing these variables has often been overlooked due to the inherent difficulties in utilizing customized and adaptive interventions to characterize healthcare providers' team-based approaches to patient care.

Collaborators

Spaulding Rehabilitation Hospital
Partners Continuing Care
content curation, participant recruitment

Partners HealthCare System, Inc.
Healthcare Knowledge Translation & Engineering Lab (KT-Lab)
program implementation

Amplifire Healthcare Alliance
Knowledge Factor, Inc.
platform management, data analysis

Methodology: Knowledge Engineering Platform

Participants: 11 Nurses and 11 Rehabilitation Therapists (n = 22)

Partners HealthCare KT-Lab employed ***amplifire***, an eLearning training platform, to evaluate 22 interdisciplinary providers. The clinical setting was selected for this pilot study because TBI patients require an interdisciplinary approach to care. This study gauged what information the participants had concerning agitation's manifestations in TBI patients and set out to elucidate the 'scope of practice' between disciplines. The participants completed the *amplifire* program's **25 'knowledge elements'** (a.k.a. questions) online in an average of **29 minutes**.

amplifire™

1) Utilizes a two-click system, requiring learners to select 1-2 answers for each 'information element' → in doing so, the program captures an individual's confidence level (see Image A.)
2) Interleaves an explanation of the correct answer (see Image B.)

Heatmapping Capability
Amplifire tabulates participants' accuracy and confidence on each 'information element' and presents them in a color-coded grid called a 'heatmap' to illustrate gaps in clinical knowledge (see Results).

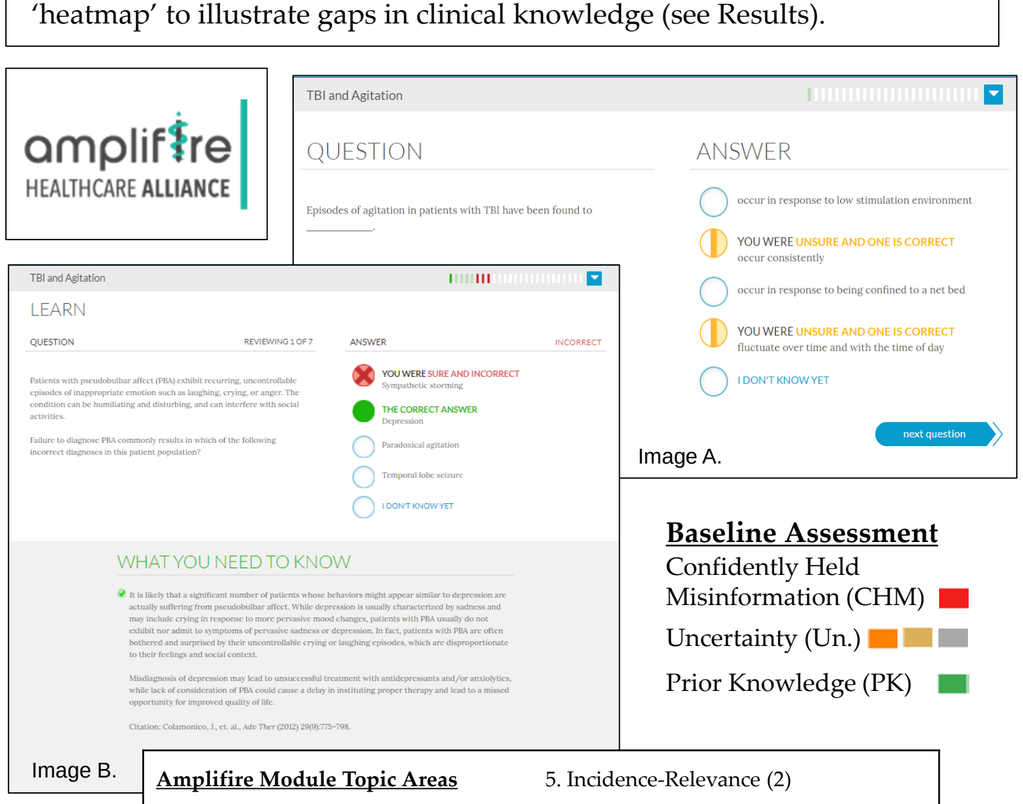


Image A.

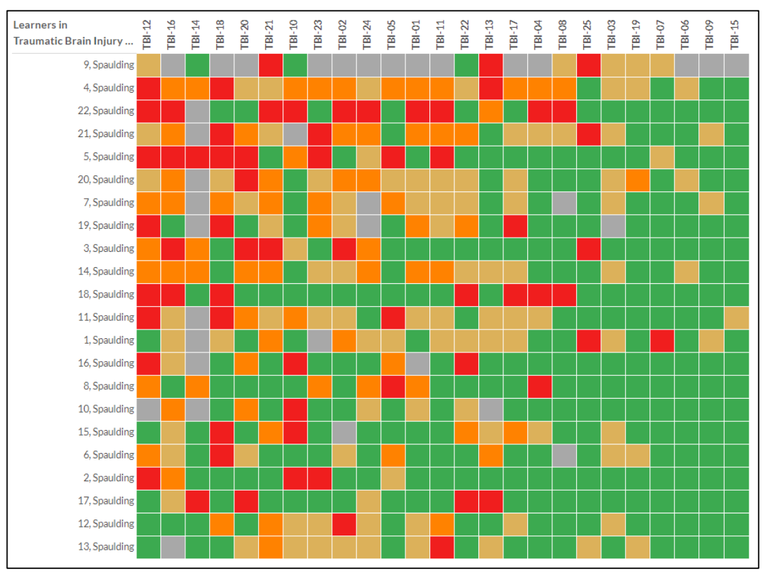
Image B.

Baseline Assessment
Confidently Held Misinformation (CHM)
Uncertainty (Un.)
Prior Knowledge (PK)

Amplifire Module Topic Areas

1. Definitions-Classifications (4)
2. Diagnosis-Tools (4)
3. Diagnosis-Evaluation (9)
4. Differential Diagnosis (4)
5. Incidence-Relevance (2)
6. Management-Treatment (9)
7. Medication (5)
8. Outcomes (1)
9. Pseudobulbar Affect (PBA) (4)

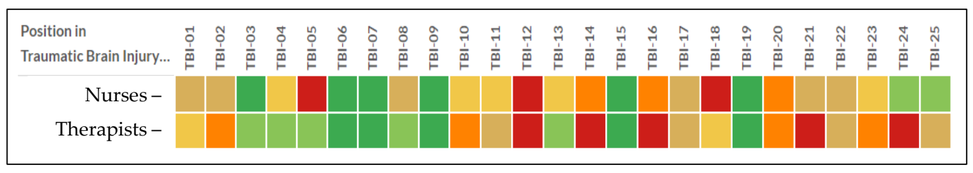
Results



Heatmap 1. Baseline Assessment, by learner

X-axis
information element
Y-axis
individual learner

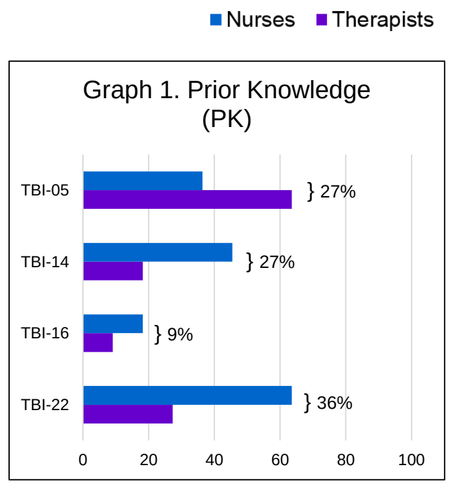
Heatmap 1.

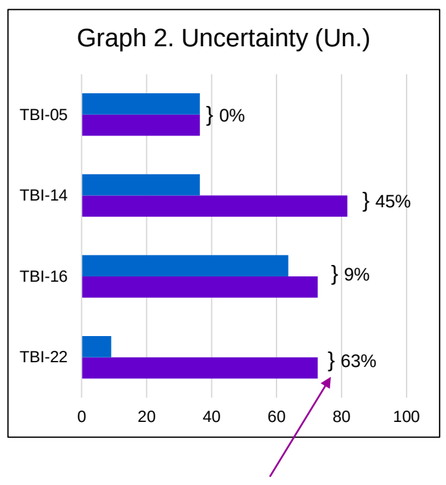


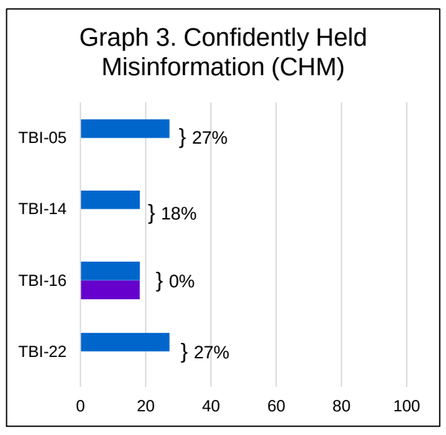
Heatmap 2. Baseline Assessment, by discipline

X-axis
information element
Y-axis
discipline

Heatmap 2.







Graphs 1, 2, & 3. Percent of Participants with Prior Knowledge, Uncertainty, & Confidently Held Misinformation in 4 Knowledge Elements

X-axis *percentage of learners*
Y-axis *selected knowledge elements*

TBI-05	The term perseveration refers to _____.
TBI-14	Which score on the Center for Neurologic Study-Lability Scale (CNS-LS) is commonly used to classify the individual as likely suffering from Pseudobulbar Affect (PBA)?
TBI-16	Which of the following head CT findings has been shown to correlate with BETTER outcomes for TBI patients with post traumatic agitation?
TBI-22	When a patient with TBI is given a beta-blocker to treat agitated behavior, subsequent episodes of agitation can be expected to be _____.

Percent Interdisciplinary Difference
= the extent to which aggregated responses between disciplines differ (e.g., 9.1% of nurses were uncertain at baseline for TBI-22, while 72.7% of therapists were uncertain)

Answers: (TBI-5) uncontrollable repetition of a word, phrase, or gesture; (TBI-14) ≥13; (TBI-16) Contusion; and (TBI-22) less severe.

Conclusions

This study elucidates how an innovative 'heatmapping' methodology captures interdisciplinary variance, providing an opportunity for administrators and providers to examine appropriate boundaries for different disciplines' 'scope of practice.' For example, with regard to…

- **symptom evaluation**, PK and CHM was higher for nurses, while both disciplines had similar levels of Un.
- **standardized instrument ratings**, PK and CHM was higher for nurses, while therapists had more Un.
- **radiologic interpretation**, PK and CHM were low and Un. was high for both disciplines
- **medical treatment**, PK and CHM was higher for nurses, while therapists had higher Un.

Future studies will include:

1. Cognitive debriefing with participants, to review how the data informs 'scope of practice' and how interdisciplinary boundaries may need to be revised in order to optimize care
2. Review sessions with administrators and managers, to assess how these findings may lead to modifications in workflow
3. Increasing participant numbers and expanding the current findings to test applicability to different therapeutic areas, care settings, and disciplines

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