Indiana Department of Health

INDIANA STATE TRAUMA CARE COMMITTEE

February 19, 2021

Email questions to: indianatrauma@isdh.in.gov

OUR MISSION:

To promote, protect, and improve the health and safety of all Hoosiers.

OUR VISION:

Every Hoosier reaches optimal health regardless of where they live, learn, work, or play.

Housekeeping

- This meeting was public noticed – anyone can attend.
- Submit questions in the chat box or you can unmute your computer.
- Please make sure you are on mute if you are not speaking.

Introduction and approval of meeting minutes

Thank you Bekah Dillon!

Traumatic Brain Injury and Community Health

Association of Decreased Glascow Coma Scores and Outcomes at Non-trauma Hospitals

Peter C. Jenkins MD, MSc

February 19, 2021

SCHOOL OF MEDICINE
INDIANA UNIVERSITY

Clinical Scenario

- 65yoM on ASA presents to local hospital after a mechanical fall.
- Large contusion on his forehead
- Smells of alcohol
- Opens eyes to verbal stimuli only
- Confused (verbal)
- Follows commands (motor)
- HR and BP are normal

Clinical Scenario

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- Confused (verbal)
- Follows commands (motor)
- HR and BP are normal

What would you do?

Overview

- Background
- Hospital variation in outcomes of patients with a GCS < 14
- Association of urbanicity and outcomes of patients with a GCS < 14
- Recommendations & Discussion

Background: What is GCS and why it matters?

- Falls in the elderly is most common injury in Indiana
- GCS is essential part of primary survey for ATLS
- Score 3-15
- Decreased GCS = TBI (until proven otherwise)
- Documented within 30 minutes for the trauma registry, so missing data represents:
  - Lapses in data quality
  - Lapses in clinical care

Glascow Coma Score

Exam	Score
Eyes	
• Open spontaneously	4
• Open to verbal stimuli	3
• Open to pain	2
• No response	1
Verbal	
• Oriented	5
• Confused	4
• Inappropriate words	3
• Incomprehensible sounds	2
• No response	1

Exam	Score
Motor	
Follows commands	6
Localizes to pain	5
Withdraws from pain	4
Flexion to pain	3
Extension to pain	2
No response	1

Indiana Field Triage and Transfer Guidelines

Transfer to a trauma center if:

- **GCS < 14**
- Systolic blood pressure < 90 mmHg
- Respiratory rate < 10 or > 29
- Other criteria available online

Signed by Governor Mitch Daniels
July 10, 2012

Methods: Variation and influence of urban status at non-trauma hospitals

- Sub-analyses of work previously presented to ISDH TCC and submitted for publication
- n = 1,560 patients with GCS < 14
- 82 hospitals (coded by urban influence score)
- Risk-adjustment – see next slide
- Multiple imputation to address missing data

Percent missingness of variables (No.=37,671)

Variable	Missing, N (%)
Age	9 (0.02)
Elixhauser Comorbidity Index	0 (0)
Race	233 (0.62)
Sex	0 (0)
Payer type	66 (0.18)
Mechanism	1,895 (5.03)
Injury Severity Score	62 (0.16)
Initial Systolic Blood Pressure	2,172 (5.77)
Initial Heart Rate	2,037 (5.41)
→ Glasgow coma scale	10,301 (27.34)
General hospital beds	0 (0)
Teaching hospital	0 (0)
Non-profit hospital	0 (0)
Urban influence code	0 (0)

Note: GCS < 3 considered missing

Tabulation of GCS

Score	n	%
3	456	29
4	38	2
5	32	2
6	67	4
7	56	4
8	61	4
9	61	4
10	87	6
11	112	7
12	188	12
13	402	26
Total	**1,560**	**100**

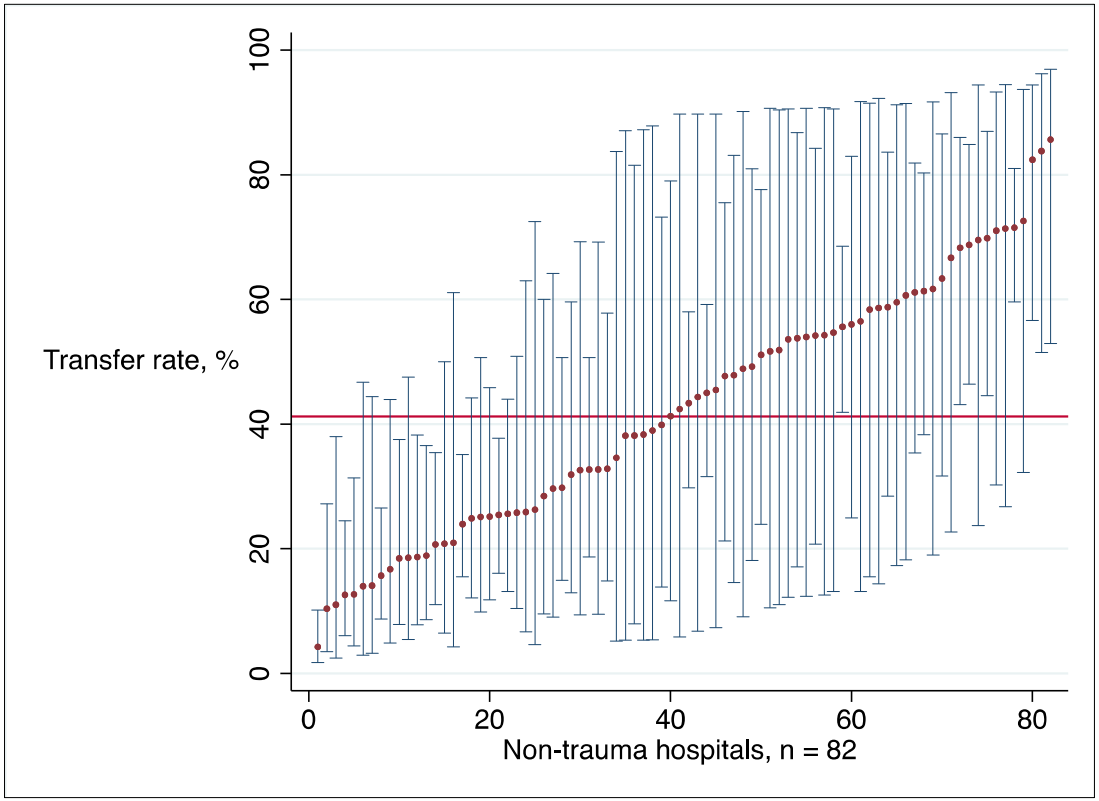
Tabulation of GCS

Score	n	%
3	456	29
4	38	2
5	32	2
6	67	4
7	56	4
8	61	4
9	61	4
10	87	6
11	112	7
12	188	12
13	402	26
Total	1,560	100

Currently, critical transfers are defined as GCS < 13.

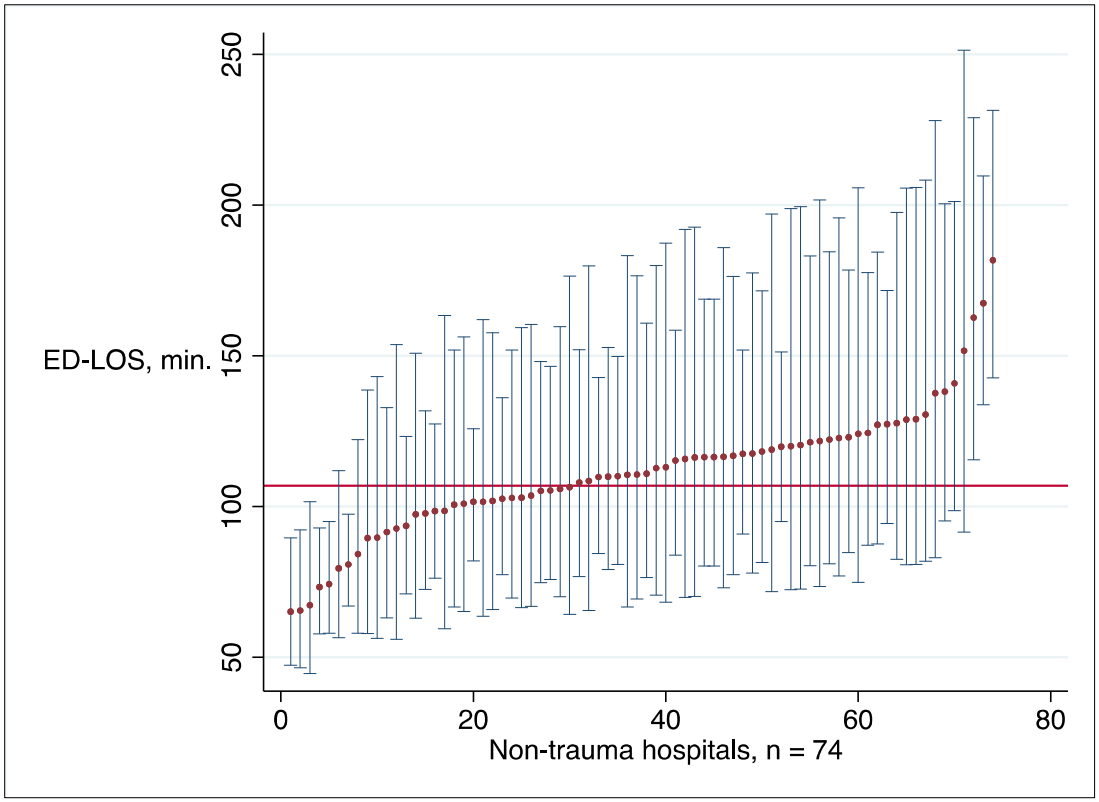
Hospital variation: transfer rates

Ranked, risk-adjusted outcome with 95% confidence intervals



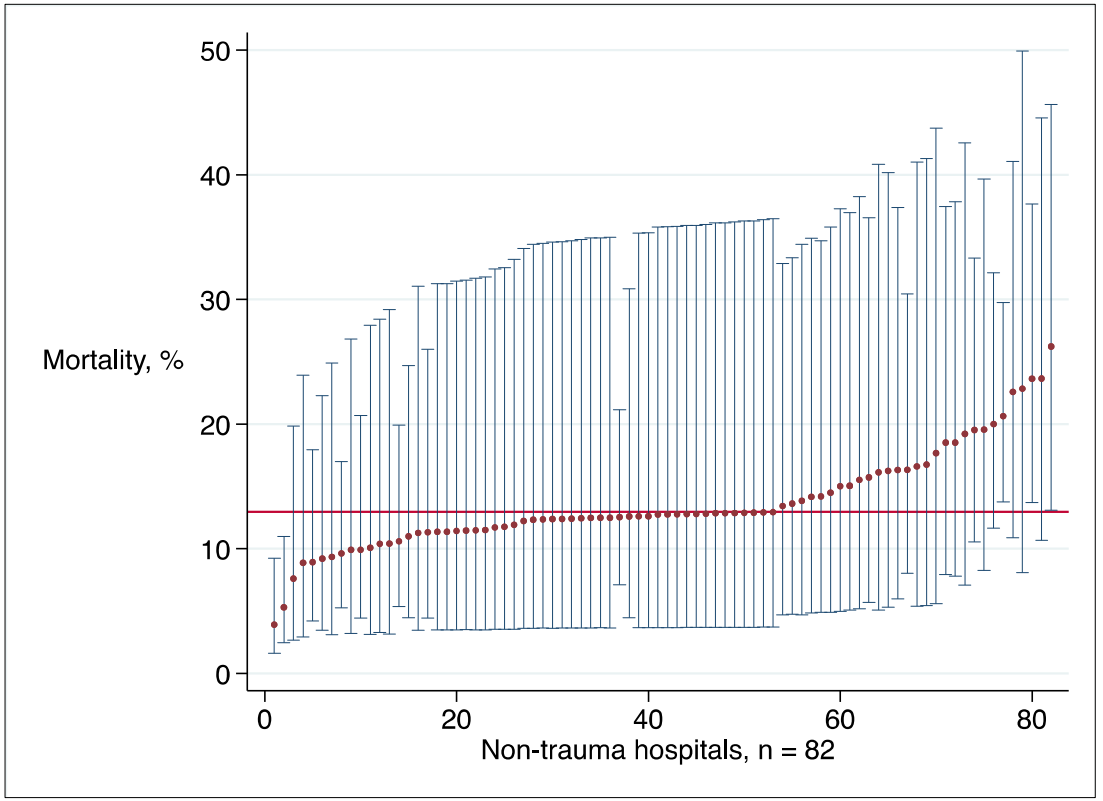
Hospital variation: ED-LOS

Ranked, risk-adjusted outcome with 95% confidence intervals



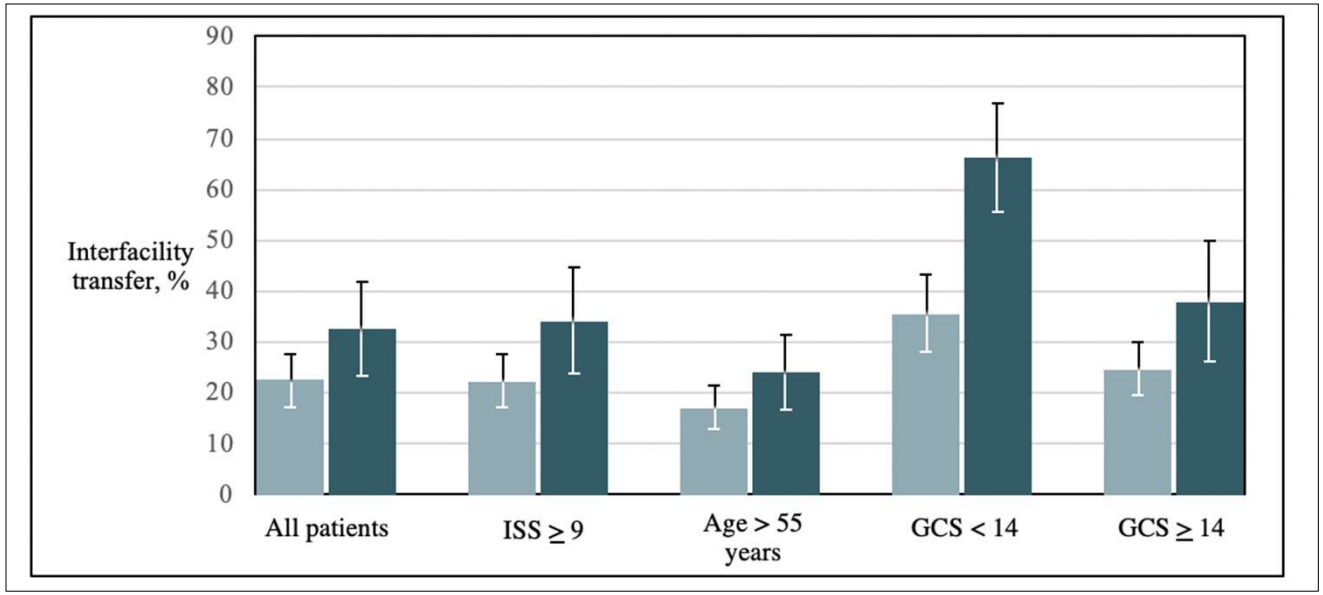
Hospital variation: mortality

Ranked, risk-adjusted outcome with 95% confidence intervals



Influence of urbanicity: transfer rates

Comparison of risk-adjusted outcome with 95% confidence intervals



Influence of urbanicity: ED-LOS

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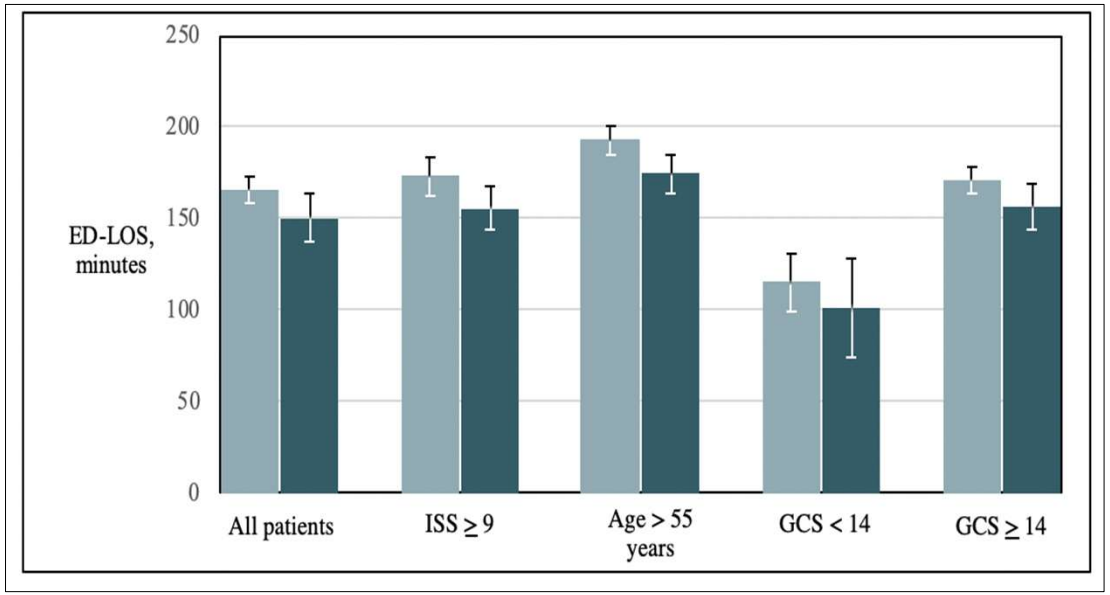

Influence of urbanicity: mortality

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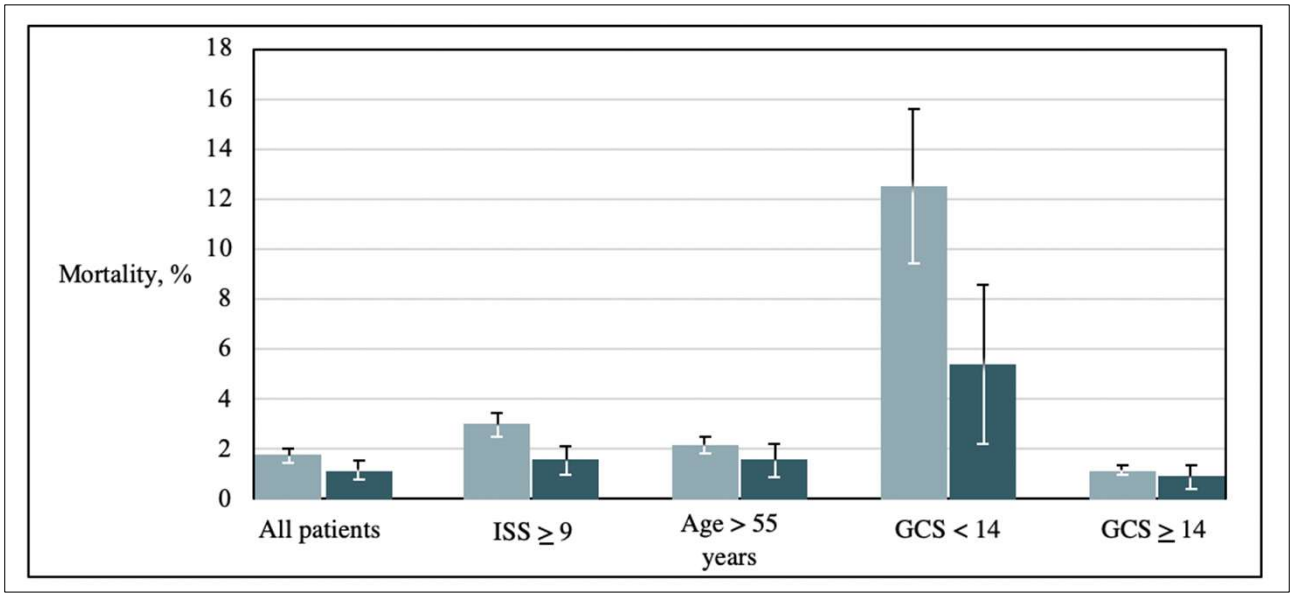

Limitations

- Analyses limited to non-trauma hospital
  - Future studies need to link non-trauma hospital data with trauma center data.
- 2013-2015 data
  - Rules governing transport patterns hasn't changed since 2012
- Retrospective analyses
  - Factors such as patient preference aren't reflected in analyses

Conclusions

- Patients with GCS < 14 are at high-risk of mortality.
- Compliance with Indiana Field Triage and Transfer Guidelines is low for those patients.
- Statistically significant variation exists among hospital.
- Urban hospitals are associate with lower likelihood of inter-facility transfer and increased in-hospital mortality.
- These forms of variation represent opportunities for quality improvement at non-trauma hospitals.

Recommendations

- Define “critical transfer patients” as GCS < 14, so it is consistent with Indiana Field Triage and Transfer Guidelines
- Evaluate and provide feedback on number of patients missing GCS scores in state trauma registry
  - Data v. clinical care?
- Provide ISDH Division of Trauma and Injury Prevention staff educational opportunities regarding trauma care
  - ATLS available from IUH Methodist Hospital – Acute Care Surgery Service

Thank you!

Developing Infrastructure to Manage TBI as a Chronic Condition: Clinical Surveillance and Resource Facilitation

2021-24 Indiana ACL TBI State Partnership Grant
Indiana Department of Health Lead Agency

Lance E Trexler, PhD and Flora Hammond, MD
Rehabilitation Hospital of Indiana – Indiana University School of Medicine

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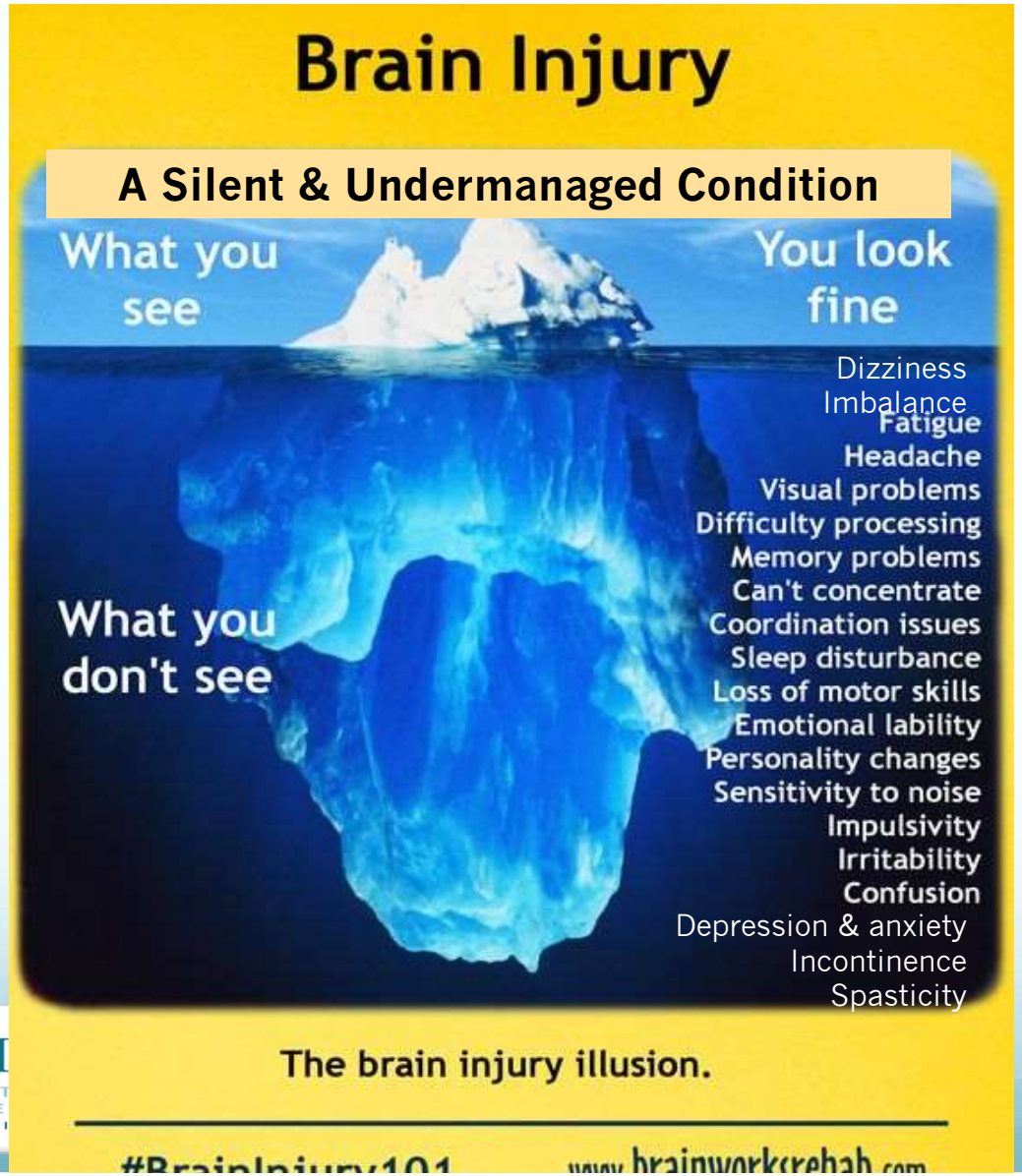
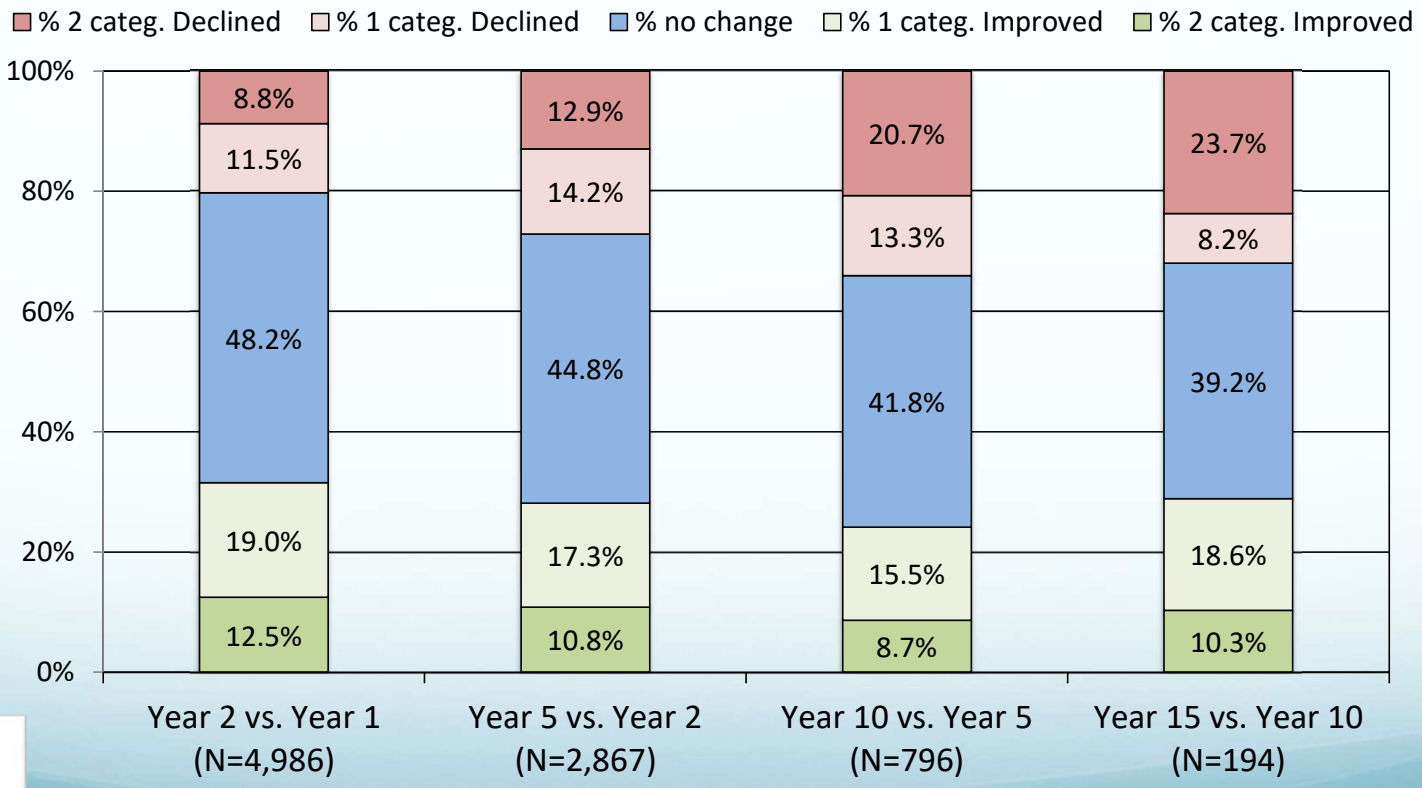


Comorbidities

- Pain
- Substance use
- Psychiatric disorders
- Social isolation
- Reinjury
- Neuroendocrine dysfunction
- Seizure
- Stroke
- Dementia
- Higher rates of diabetes, hypertension, myocardial infarction, cerebrovascular & peripheral vascular disease, chronic pulmonary disease, & renal disease

Change in Function over Time: Glasgow Outcome Scale-Extended (GOS-E)

TBI Model System National Data & Statistical Center



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Change in GOS-E

Slide courtesy of Flora Hammond, M.D.

Resource Facilitation Defined

- individualized assessment
- provide brain injury specific education and promote awareness of resources
- proactive navigation to community-based supports, resources and services
- remove instrumental barriers (e.g., housing) as well as brain injury-specific barriers (e.g., memory impairment) to successful community re-integration and return to work.

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Evidence for Resource Facilitation in Acute and Chronic TBI

- Significant improvement in return to work/school
  - Acute
  - Chronic
- Significant economic impact
- Significant reduction in services used/desired
- Significant reduction in level of disability
- Significant reduction in recidivism

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Trexler, L.E., Parrott, D.R., & Malec, J.F. (2016). Replication of a Prospective Randomized Controlled Trial for Resource Facilitation to Improve Return to Work after Brain Injury. *Archives of Physical Medicine and Rehabilitation,* 97(2), 204-210.

Trexler, L.E., Trexler, L.C., Malec, J.F., Klyce, D., & Parrott, D. (2010). Prospective randomized controlled trial of resource facilitation on community participation and vocational outcome following brain injury. *Journal of Head Trauma Rehabilitation,* 25(6), 440-446.

Trexler, L.E. & Parrott, D.R (2018). Models of Brain Injury Vocational Rehabilitation: The Evidence for Resource Facilitation from Efficacy to Effectiveness. *Journal of Vocational Rehabilitation.* 49(2), 195-203.

Trexler, L.E. & Parrott, D.R. The impact of resource facilitation on recidivism for individuals with traumatic brain injury. Manuscript submitted.

Managing Brain Injury as a Chronic Condition

- Clinical surveillance to allow early detection and intervention for health complications
- Preventive interventions that target high incidence/ high risk complications
- Patient engagement & self-management training to improve health and well-being
- Access to medical care and rehabilitation services to treat complications and optimize function

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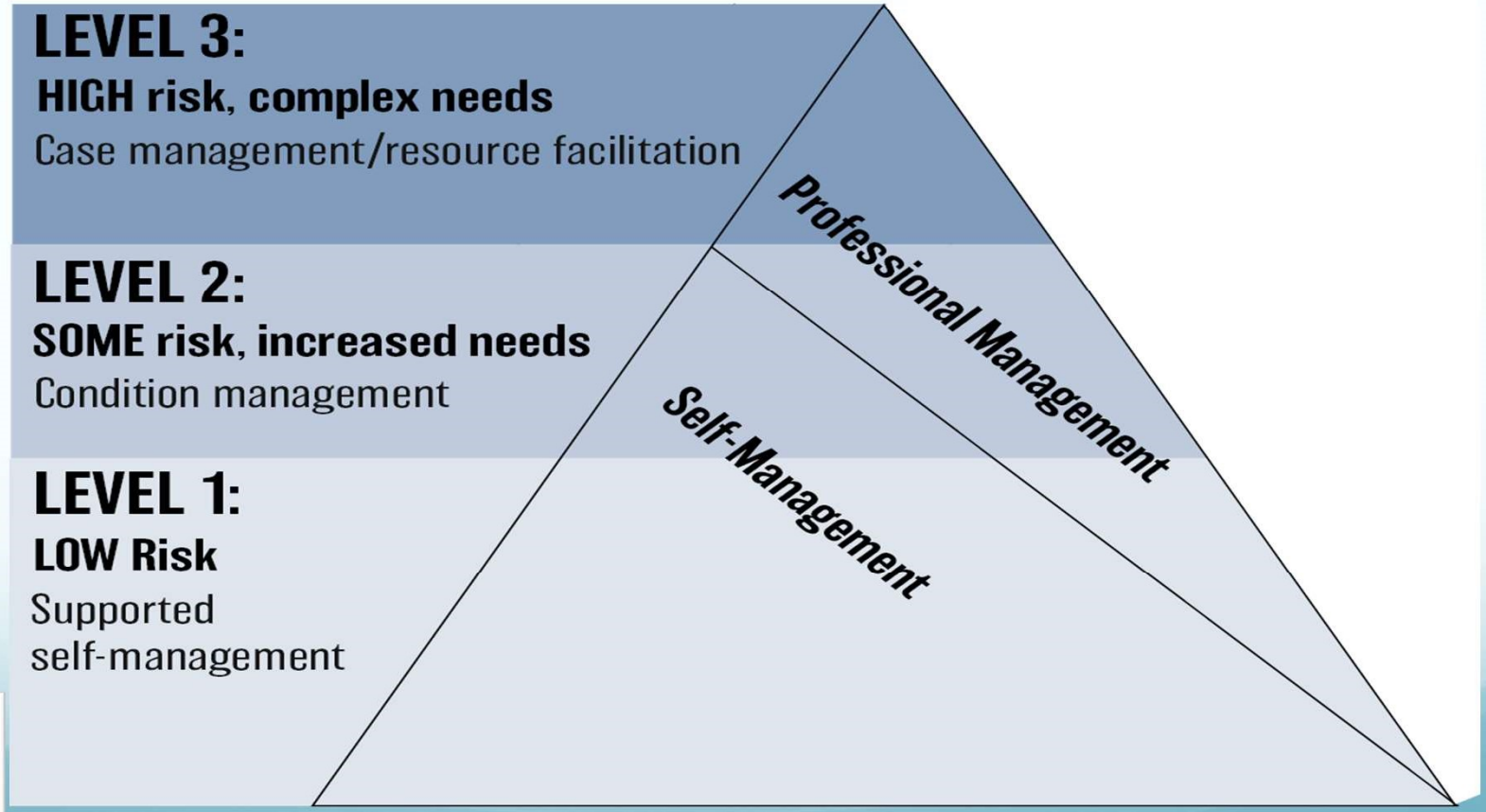
Risk Stratification for Chronic Condition Management

Target the right people with the right intensity



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Indiana IDH ACL TBI Grant 2021-26

Implementation of a Sustainable TBI System for Clinical Surveillance, Information and Referral, and Resource Facilitation

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Indiana ACL TBI 2021-24 Goals

- Implement a clinical surveillance model for TBI starting at a Trauma Center
- Based on surveillance and risk for suboptimal recovery, provide two levels of intervention:
  - Information and Referral
  - Resource Facilitation
- Demonstrate the impact of surveillance and intervention on health care service utilization, health care expense, and on clinical outcome
  - IU Population Health
  - Regenstrief Institute
  - RHI

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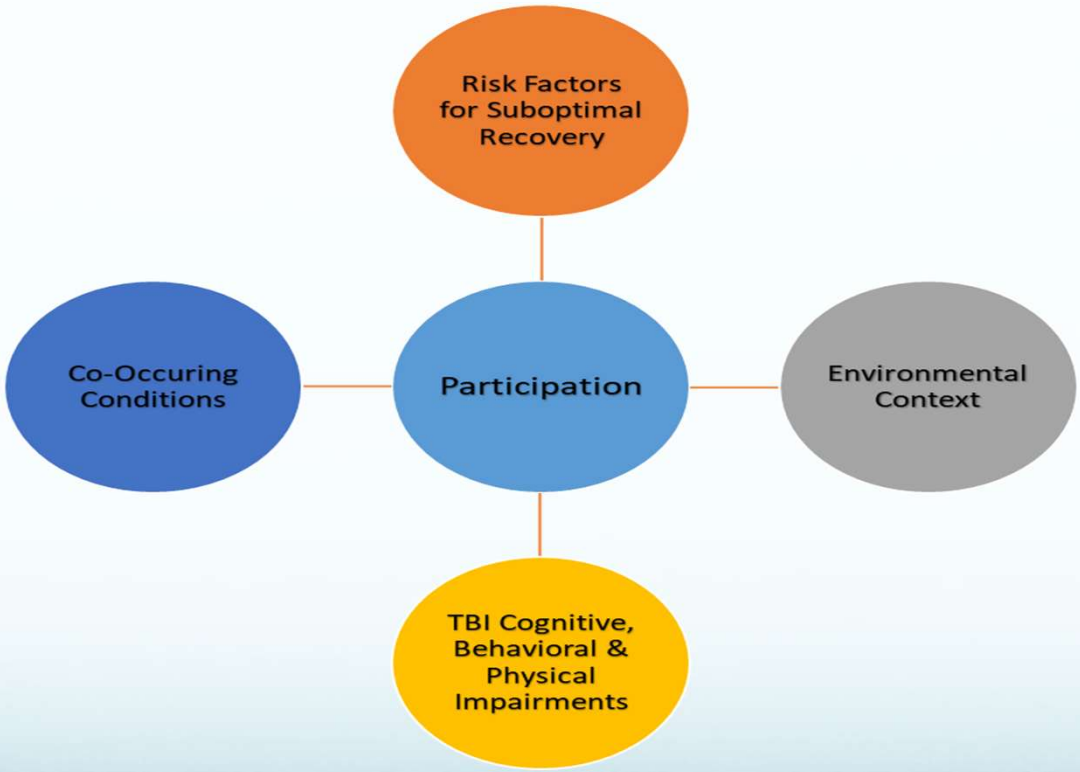
Sectors for Clinical Surveillance in TBI



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MyBrain 2.0 and Clinical Surveillance Model

- Metrics for TBI-specific (e.g., ,memory) and other determinants of recovery (e.g., family support) or risk factors for sub-optimal recovery (e.g., substance abuse)
- Frequency of assessment risk-stratified and provides rapid response strategies (e.g., suicidality)
- Provides feedback to participant and family
- Inform need for services/supports and type of services/supports and measures response to treatment
- Communicate/interact to promote data-informed collaborative care
- Provide for individual and cohort of interest surveillance
- Links to self-management applications (e.g., relaxation training)

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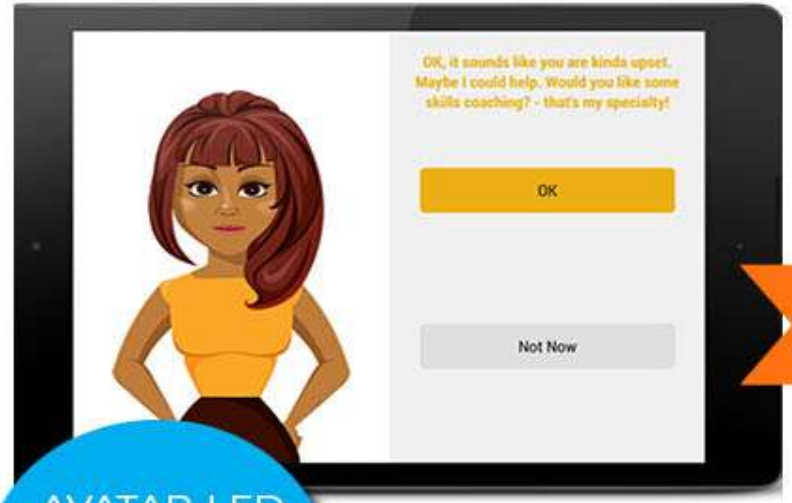
WHAT IS MYBRAIN?

DISCOVER WHAT'S HAPPENING IN YOUR CLIENT'S HEALTH AND WELL-BEING BETWEEN VISITS

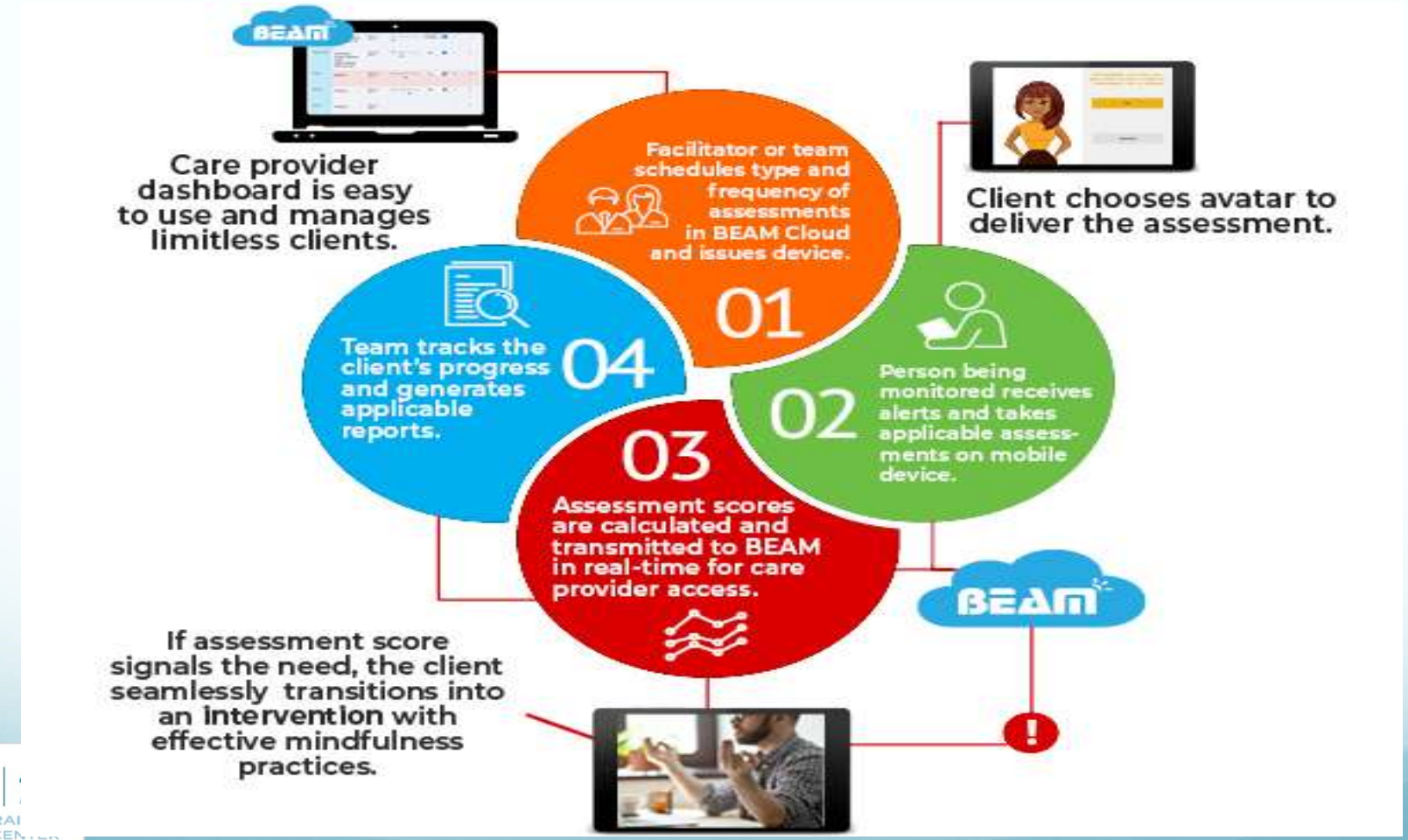


AVATAR-LED ASSESSMENTS FOR YOUR CLIENTS

THE POWER OF DATA TO DEVELOP PERSON-CENTRIC CARE PLANS FOR YOU

RESEARCH, TRAINING & OUTCOME CENTER *for* BRAIN INJURY

HOW DOES MYBRAIN WORK?



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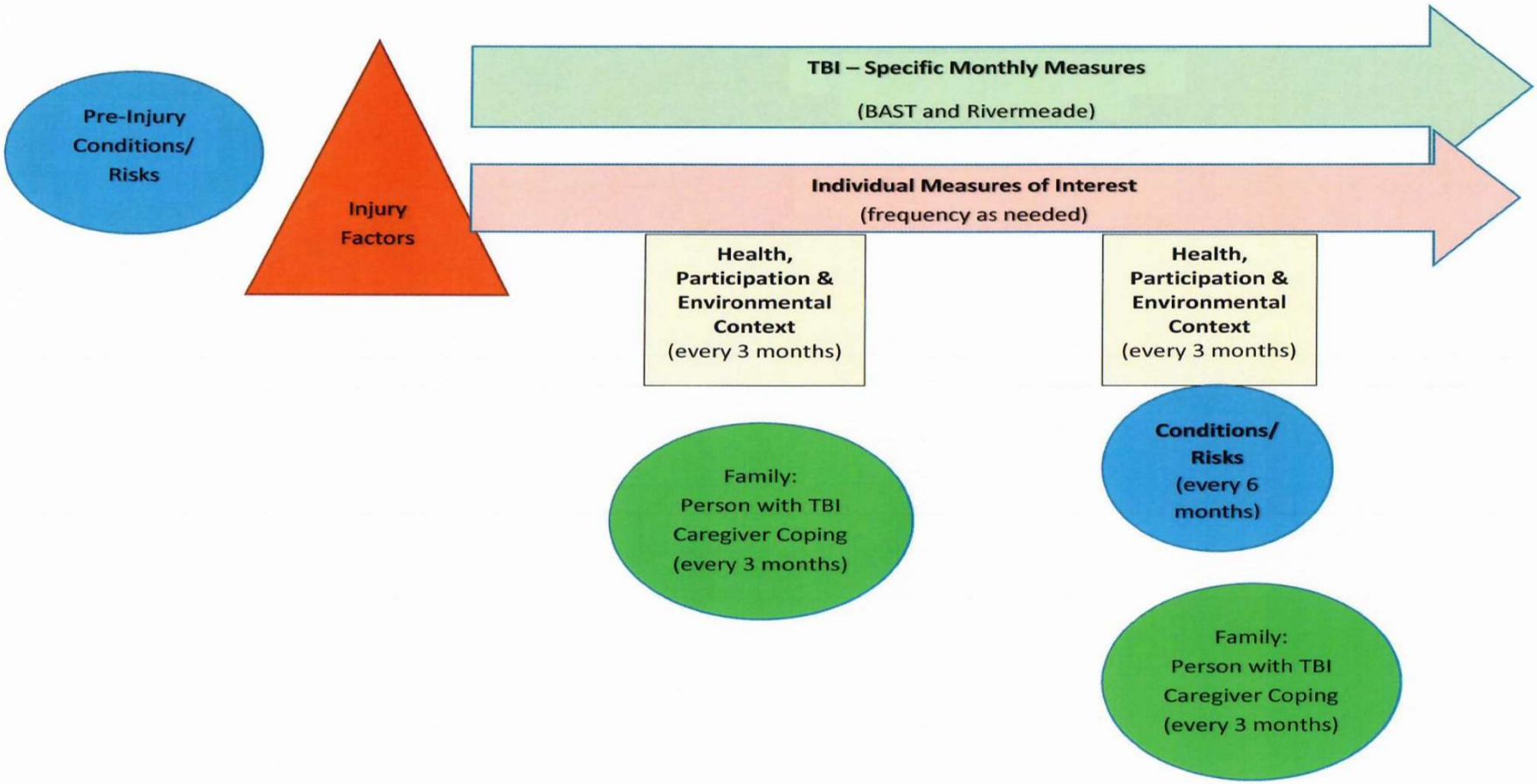
TBI Clinical Surveillance Model



Stratified Surveillance and Intervention Model

Surveillance	• Level 1: Initially telephonic to assess trajectory/engagement • Level 2: MyBrain for TBI-specific and individualized measures of interest
Some Risk Factors for Sub-optimal Recovery: Information, Referral and Follow-up	• MyBrain Surveillance and Self-Management Strategies • TBI education and support • Referral for services and supports based on surveillance • Scheduled follow-up to ensure outcome
Significant Risk for Sub-Optimal Recovery/Institutionalization: Resource Facilitation	• Same as above + • Evidence-based protocol with assigned Resource Facilitator • TBI Specialist Team Case Conferences

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ACL TBI 2021 Grant Methods

- Enroll at IU Health Methodist Trauma Center/Acute Care
- Provide Surveillance and Stratified Interventions (I/R and RF)
- Obtain baseline health care utilization and costs across all relevant domains (hospitalization, ED visits, professional, ancillary, etc)
- Obtain clinical outcomes via MyBrain as well as health care utilization and costs for TBI surveillance and intervention cohort for comparison with baseline cohort

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Updates

Katie Hokanson, *Director of Trauma and Injury Prevention*

This meeting has been public noticed

2021 meeting changes

- ISTCC will meet quarterly vs. bi-monthly in 2021.
- Plan for meetings to be virtual for the foreseeable future.

2021 meeting changes

- **2021 meeting dates:**
  - **May 21**
  - **August 20**
  - **November 19**

Division grant activities

- **STOP School Violence Grant Program**
  - **Was not awarded.**

Division staffing updates

- Chinazom Chukwuemeka – Data analyst moved to the IDOH Epidemiology Resource Center.
  - Backfilled by Emma Heltzel, Fall division intern.
- Lauren Harding – Drug Overdose Prevention Epidemiologist moved to Arizona Department of Health.
  - Backfilled by Sydney Whiteford, Summer division intern.
- Meghan Davis, records consultant, deployed with the Indiana National Guard.
  - Backfilled by Keenan Young.

- Spring division interns:
  - Victoria Marshall & Kyler Bonilla
    - Trauma & Injury Prevention Program
  - Ayana Miles
    - Naloxone program
  - Anmol Brar
    - Drug Overdose Prevention program
  - Mason Lown
    - Indiana Violent Death Reporting System (INVDRS) program

Stroke center list

- IC 16-31-2-9.5
  - Compile & maintain a list of Indiana hospitals that are stroke certified.
  - https://www.in.gov/isdh/27849.htm
  - Transfer agreements – must be stroke specific.

Stroke centers that need to provide updates

- St. Joseph Hospital
- IU Health – LaPorte
- St. Vincent Anderson
- Community Hospital South
- Elkhart General Hospital
- Franciscan Health – Dyer
- Johnson Memorial
- Franciscan Health – Mooresville
- St. Joseph Regional Medical Center – Plymouth
- St. Joseph Regional Medical Center South Bend

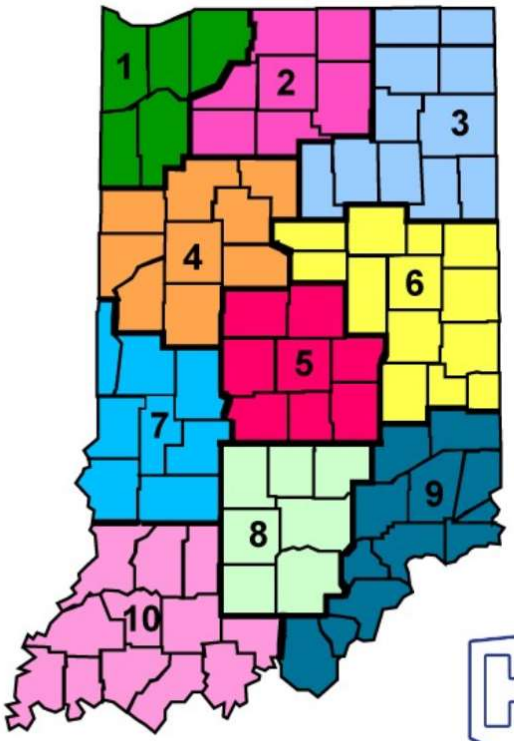
Injury Prevention Updates

- Creating and disseminating COVID-19 guidance for injury prevention programs.
- Working to recertify all leaders for Stepping On

Regional Updates

Regional updates

- District 2
- District 3
- District 5
- District 6
- District 7
- District 8
- District 10



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District 1

District 2

D2TRAC met via Zoom on Tuesday, February 16

- There were 29 participants
- Seven hospitals represented
- Two EMS agencies represented
- IDOH represented
- Two case summaries were reviewed
- Dr. Thomas gave a presentation on the Evolution of Hemorrhagic Shock
- Committee discussed plans for outreach and injury prevention
- Next meeting is scheduled for May

District 2

MHSB and EGH have new Trauma Coordinators overseeing PI.

- MHSB has: Tanya Toth and Crystal Foster (both started at the end of November)
- EGH has: Eric Parmley (started in September)

EGH will have their virtual ACS visit in April (tentatively scheduled for April 29th; waiting on the VRC to confirm the date with the survey team)

District 3

- Lisa Hollister will provide the update.

District 4

District 5

Meeting on February 17

- Review of Q2 2020 D5 Data.
- Further drill down of Q2 data is needed to determine root cause of missing EMS scene times.
- Dr. Kaufmann is in the process of reviewing data from the EMS database from Q1 & Q2 2020 to compare to determine if there is a data concern.
- Once the data is reviewed, the findings will be shared with the group.

District 5

- Reviewed and discussed challenges with timeliness of receiving autopsy reports.
- Group decided to move forward with setting up a meeting with D5 members and the Marion County Coroner's Office.
- Goal of the meeting is to understand the Marion County Coroner's process and the expected timing of autopsy reports.
- District 5 will also use this time to communicate the importance of timely autopsy reports and how it drives performance improvement.

District 5

- IU Methodist shared current PI initiatives.
  - 3 hospital-based projects were shared and reviewed with the group.
- The next meeting is May 19 and we will review activation criteria.
- In District 5, the majority of patients are elderly, blunt trauma.
- Eskenazi is going to share their hospital's specific PI surrounding activation criteria.

District 6

- No real significant updates, but discussed all of our normal agenda items.
- Functioning during COVID
- EMS Challenges with transport availability stretching our transfer times out somewhat
- Challenge of doing prevention activities
- Discussed some TQIP and data questions. TPM's planning to connect with registrars and discuss TQIP results.

District 7

- Both trauma centers will be going through ACS reverification in 2021.

District 8

- IU Health Bloomington received their official letter of reverification from the ACS. They will have their next survey in January 2024.

District 9

District 10

Trauma System Planning Subcommittee

- Have not met since October 2020 meeting.

Designation Subcommittee

Performance Improvement Subcommittee Update – October 2020

Peter M. Hammer

Trauma Medical Director

IU Health Methodist Hospital

2020 Goals Refresher

- Decrease ED LOS at non-trauma centers
- Increase trauma registry quiz participation
- Collect hospital level variables
- Continued EMS run sheet collection

These goals with be discussed at the next PI meeting, whether to add/subtract.

Number of Reporting Hospitals

Q3 2019	108
Q4 2019	108
Q1 2020	103

Transfer Delays

- **Q3 2019 (N=544)**
  - Null (N=144)
  - Receiving Facility Issue (N=73)
  - EMS Issue (N=67)
  - Referring Facility Issue (N=44)
  - Other (N=40)

Transfer Delays

- **Q4 2019 (N=439)**
  - Null (N=177)
  - Receiving Facility Issue (N=64)
  - EMS Issue (N=57)
  - Referring Facility Issue (N=53)
  - Other (N=23)

Increase Trauma Registry Quiz Participation

May – 38 individuals

June – 38 individuals

July – 39 individuals

August – 26 individuals

September – 22 individuals

- Continued promotion of quiz participation
  - If you have registrars/other staff interested in taking quizzes for CEUs, please contact Trinh Dinh at tdinh@isdh.in.gov or Chinazom Chukwuemeka at cchukwuemeka@isdh.in.gov

Hospital Level Variables

- Variables being collected:
  - Teaching status (Community, Non-Teaching (no residents), University
  - Profit (For or Non)
  - Number of beds
  - Number of ICU beds
  - Number of Trauma, Orthopedic and Neuro – surgeons

- Currently, 93 hospitals have responded to this request.
  - Be on the lookout for email reminders from Ramzi Nimry to complete this survey.

PI Subcommittee Schedule

- Next meeting is November 17th at 10a on Microsoft Teams.
- 2021 Dates TBD

PI Subcommittee

ACS-COT updates

- Dr. Thomas updates

State EMS Medical Director updates

Dr. Michael Kaufmann

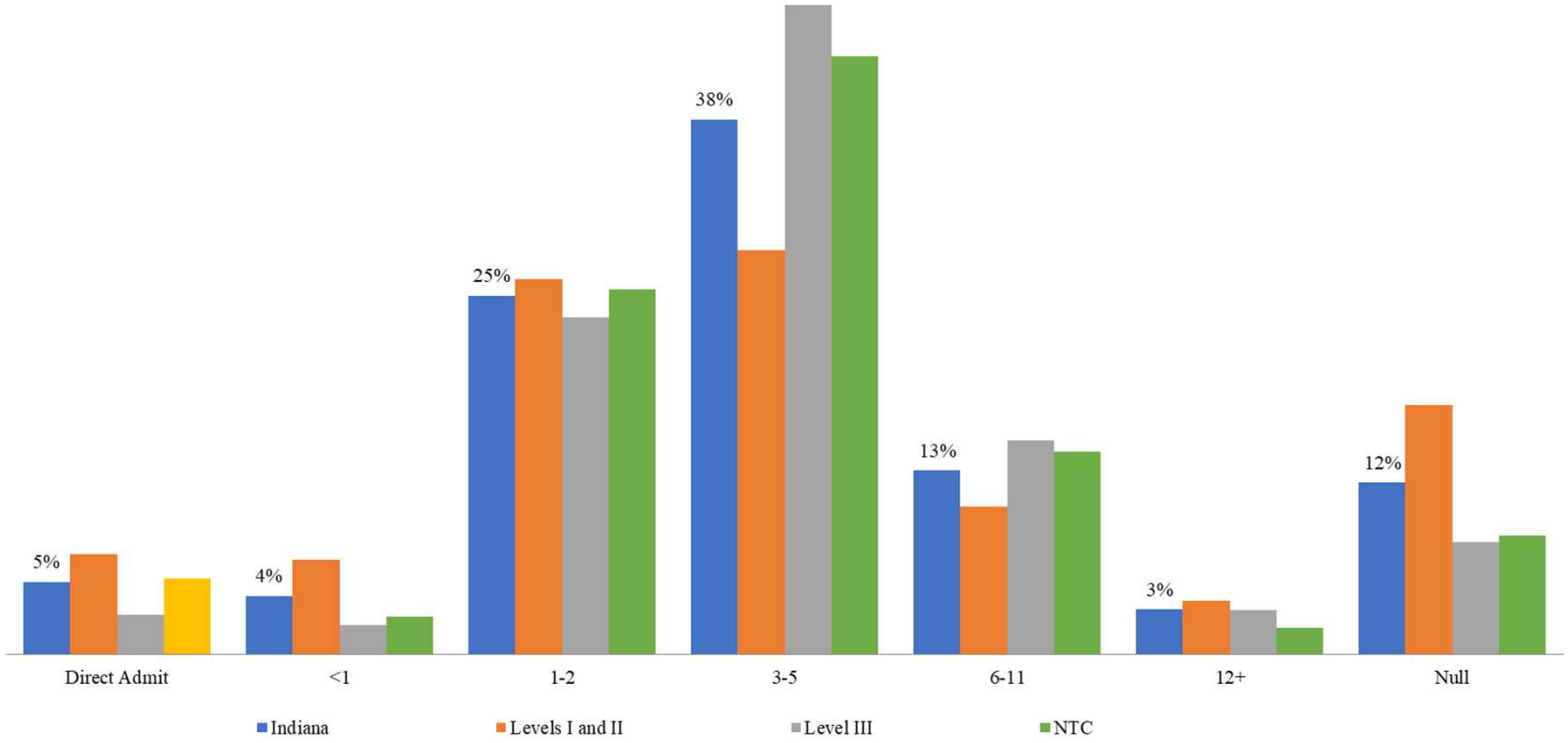
Trauma Registry

Trinh Dinh, *Data Analyst*

Quarter 1 2020

- 108 hospitals reported
  - 10 Level I and II trauma centers
  - 13 Level III trauma centers
  - 85 non-trauma centers
- 8,109 incidents
- 254 incidents with ED LOS > 12 hours
- 689 linked transfer incidents

The majority of patients in the ED stay for **1-5 hours.**



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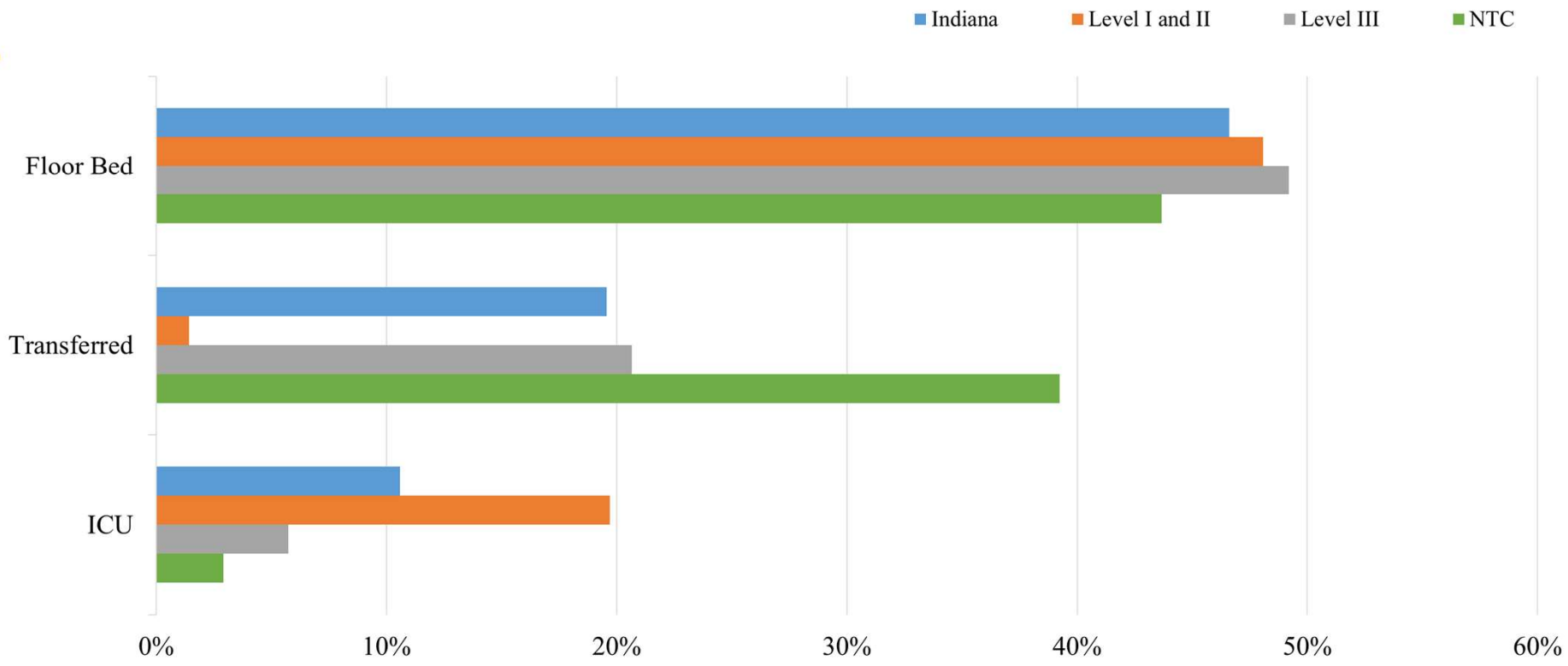
The majority of patients in the ED go to a **floor bed** after being in the ED



Statewide categories <10% include: OR, home w/o services, observation, step-down, expired, and NK/NR/NA.

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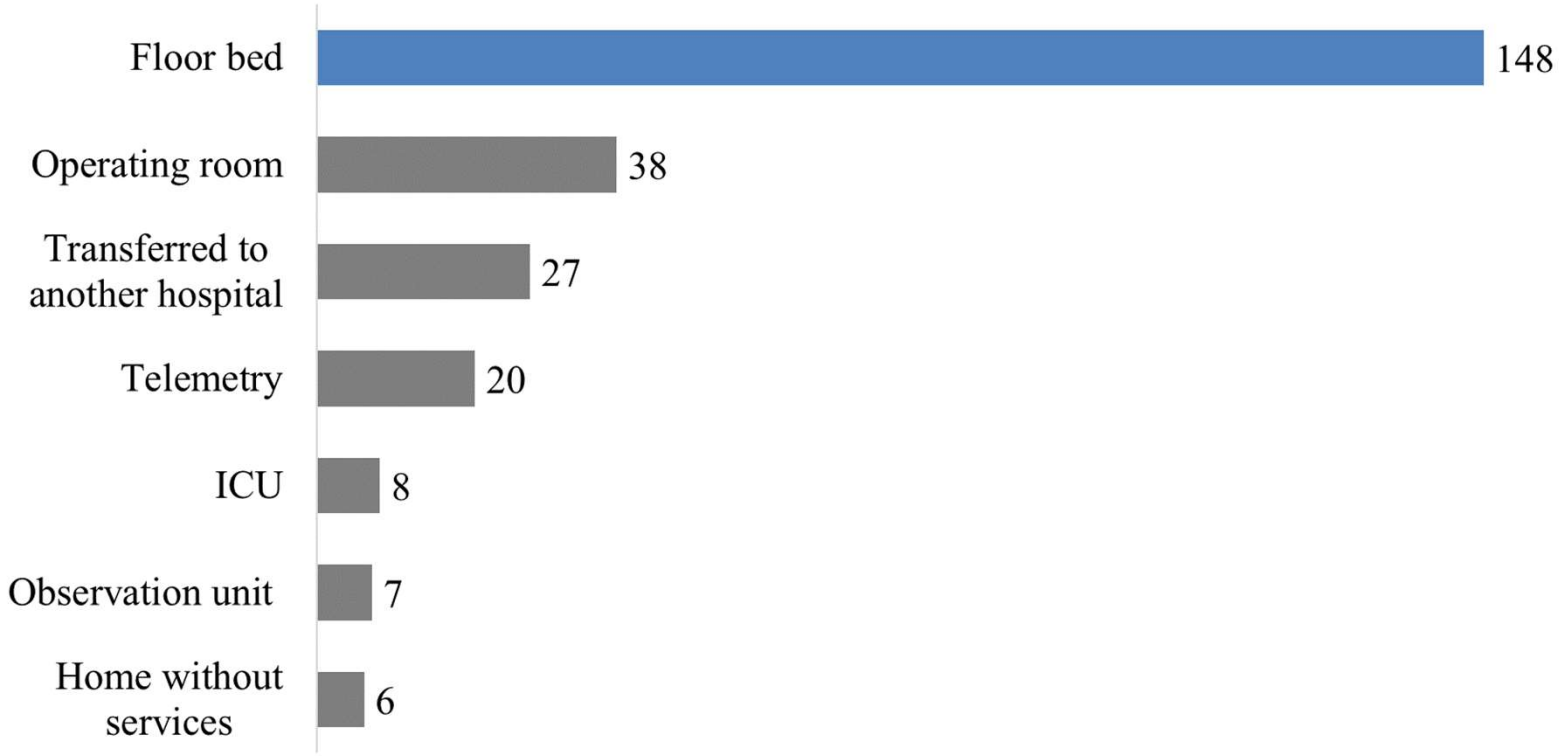
Most patients go to a floor bed after being in the ED for more than 12 hours.



Categories with counts <10 include: AMA, home without services, other and unknown.

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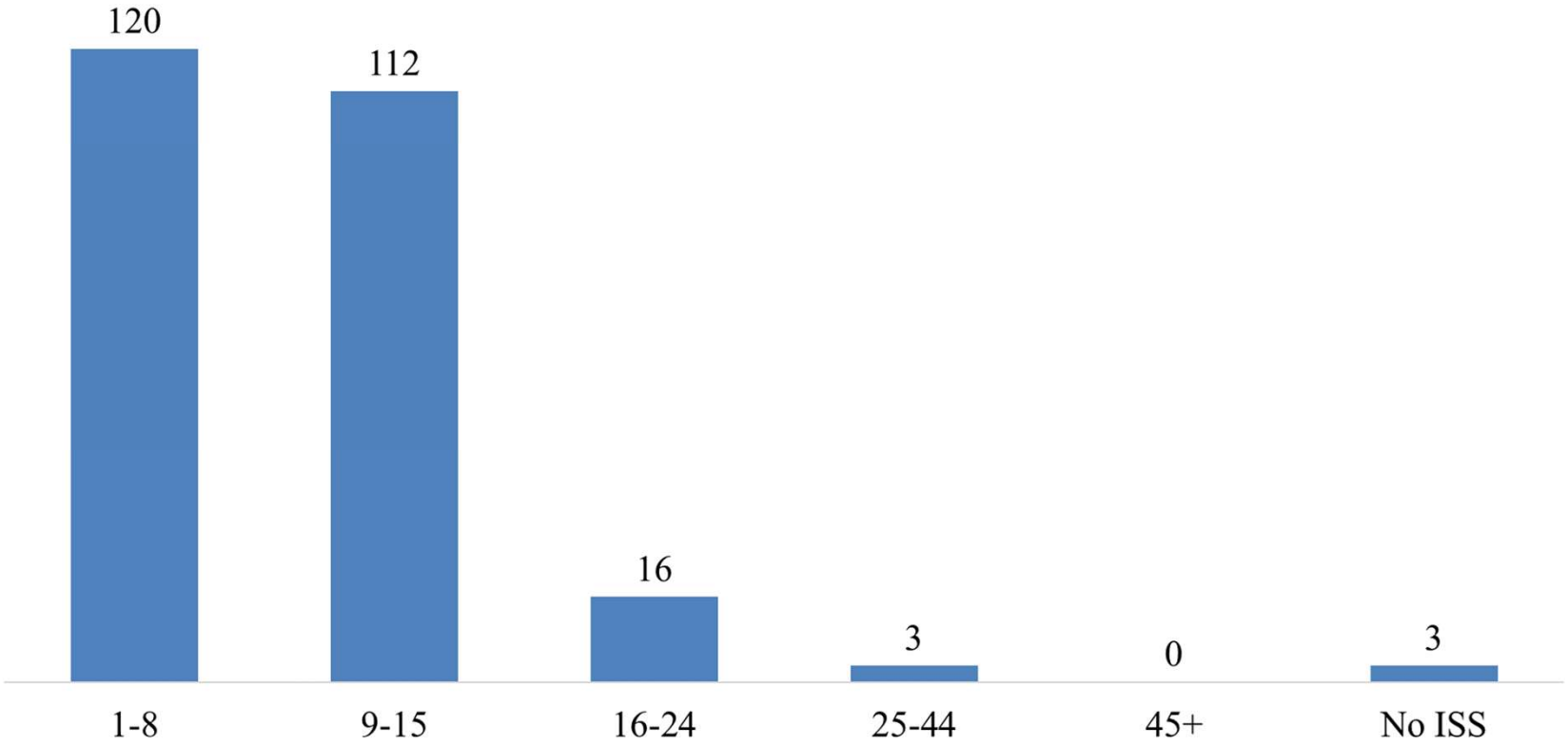
The majority of patients have an ISS score of **1-15.**



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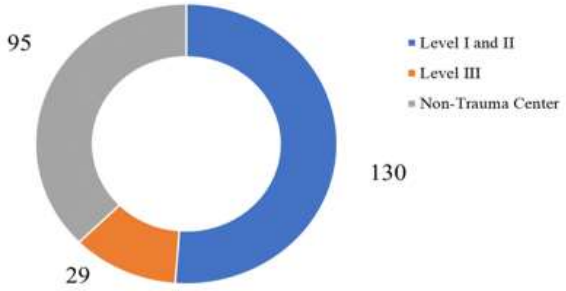
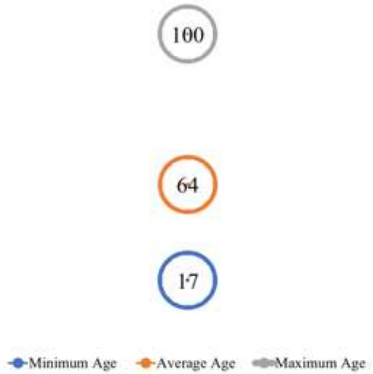
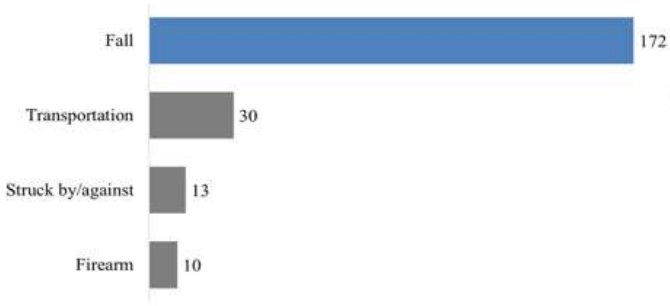
The majority of patients were at a level I or II trauma center.



The average patient age was 64 years.

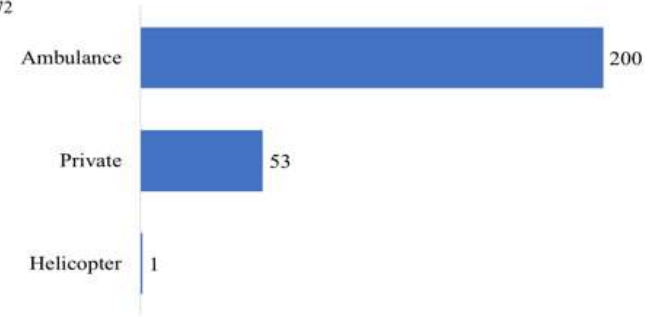


Falls were the most common cause of injury.



Counts <10 include: Cut/pierce, fire/burn, machinery, natural, overexertion, suffocation, other specified, and other.

The majority of patients are transported by ambulance.



Indiana Department of Health

Other Business

- Dr. Lefort
  - Survey: rapid blood transfusions in pediatric trauma patients.

Next ISTCC Meeting

May DATE