SLAM+ prototype
MTEC Warfighter Brain Health

LIMBIC - Military and Tactical Athlete Research Study
Employing Evidence-Based Technology to Drive Return to Activity

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Problem with mTBI care

The current pipelines to support return to activity are low-reliability systems.

- Poor understanding of risk factors that determine return to activity
- Lack of high-reliability systems to accelerate return to activity at scale
- Inability to rapidly drive best practices into clinical workflows

- Low standardization and clinical relevance of most published research
- Disconnect between knowledge and practical clinical tools.
- Gap from research discovery to clinical implementation

User-friendly Tools are needed to (a) identify individuals at risk for prolonged mTBI-related symptomology, (b) make evidence-based recommendations to facilitate recovery, and (C) guide the overall process through return to activity and beyond.
SLAM+ Workflow Training Prototype
Enabling the learning health system with Open Standards, Open-Source process automation

SLAM+ LIMBIC MATARS training demo

- Choose an individual with acute mTBI from the High, Medium or Low risk cohort.
- Collect and use individual data to guide them towards the most rapid recovery.
- Media rich, highly configurable process-based CPG training workflows.
- Deploy CPGs as code into Defense Health Agency and Veterans Health Agency clinical workflows. (Future)
Intelligent automation: Sports as a Laboratory Assessment Model (SLAM)

- **SLAM** is a gold-standard approach to evaluating athletes before, at the time of and throughout recovery from mTBI.

- **LIMBIC-MATARS** will deploy SLAM to deliver a uniform, gold-standard assessment to 15,000+ student athletes and ROTC cadets.

- The **LIMBIC-MATARS NCAA partners** are in alignment with SLAM, which allows for easy implementation of the enhanced, standardized, evidence-based protocol.
Solution to mTBI Care in 4 Steps

Extracting and operationalizing best practices from our prospective research study

Steps 1 and 2: From Data to Knowledge
- Conduct study
- Gather data
- Analyze Data
- Gather Findings

Steps 3 and 4: From Knowledge to Outcomes
- Encode Knowledge as CPGs
- Run CPGs as Software with Data for Training

Diagram:
- CRMS Environment
- Research Environment
- Translational Research Authoring Environment
- Care Delivery & Training Environment
Step 4 – Automating CPGs – Powered by HealthConcourse

Extracting and operationalizing best practices from our prospective research study

HealthConcourse is Perspecta’s Healthcare Interoperability Platform
- Data interoperability
- Knowledge interoperability
- Process interoperability

- Conduct study
- Gather data
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- Encode Knowledge as CPGs
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Powered by HealthConcourse
HealthConcourse CPG operationalization: data object binding

Event driven Data Objects that Start process

SLAM+

Data objects needed as input or output from modeled activities

Bound to FHIR endpoints from HealthConcourse with patient data sourced from multiple EMRs/SORs

Right Data, Right Time, Right Place
Care without Boundaries
Propose near real time SLAM+ dashboards

**Name:** Carol Davis  
**Birthdate:** 11/1/2002  
**Age:** 18  
**Height:** 5'10"  
**Weight:** 151 lbs  
**Year:** 2nd year  
**Position:** PG  
**Prior Concussions:** 3

### Symptom Severity Chart

- **Number of Athletes:**
  - **Symptom Severity:**
    - Neck Pain: 6
    - Nervousness: 4
    - Tingling: 6
    - Drowsiness: 4

### Recovery Chart

- **Days:**
  - 1 to 20: Symptoms improving
  - 21 to 40: Symptoms stable
  - 41 to 60: Symptoms worsening

### Potential Actions

- **Recommendations**
  - Neck Pain
  - Nervousness
  - Tingling
  - Drowsiness

### Progress Measures

- **Measure:**
  - Tandem Gait
  - NIH Toolbox
  - HIS-r
  - ImPACT

- **Progress:**
  - Typical Recovery (UVA)
  - Typical Recovery (National)
  - Protracted Recovery (All)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Severity</th>
<th>Duration</th>
<th>Potential Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neck Pain</td>
<td>6</td>
<td>4</td>
<td>Recommendations</td>
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