Implementation of an iPad-based Concussion Assessment Tool within a Practice-based Research Network (PBRN): Preliminary Results, Challenges, and Strategies for Success

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Background

- Traumatic brain injury is one of the most significant public health problems in the United States, and it is the leading cause of death among young people.
- Approximately 1.7 million brain injuries occur each year.
- Estimated costs of mild traumatic brain injury approach $17 billion annually.
- Increased understanding of the effects and consequences of concussion and mild traumatic brain injury (mTBI) has led to the development of position papers, systematic assessment tools and protocols for evaluating the neurological, behavioral, and cognitive effects of these injuries, based on research and expert consensus.
- Although organized surveillance and management protocols are routinely in place within professional and intercollegiate sports, they are not widely used in youth sports, and none of the recent international symposia on concussion in sports has focused specifically on pediatric concussions.
- Several other states have ratified concussion legislation that is designed to protect child and adolescent health by requiring that concussed kids be medically cleared before returning to play.
- These laws create a practice gap, as many medical and healthcare practitioners who will be called upon to evaluate concussions in young patients are not trained in recognizing or managing the signs and symptoms of concussion.

Methods

**PROVIDER TRAINING PROTOCOL**

1. **20-item pretest:** assessed initial provider concussion knowledge
2. **Webinar on Concussion Management (ACSM):** focused on concussion education, evaluation, and medical management
4. **Sport Concussion Assessment Tool 2 (SCAT2) and Balance Error Scoring System (BESS) Demonstration Videos:** produced by the Matthew A. Ollendorf, Sports Related Traumatic Brain Injury Research Center
5. **20-item posttest to assess efficacy, 80% required to administer SCAT2**

**SCAT2 data collected via iPad app at baseline and post-injury**

<table>
<thead>
<tr>
<th>SUBJECT RACE/ETHNICITY (n=139)</th>
<th>Caucasian/White</th>
<th>African American/Black</th>
<th>Hispanic/Latino</th>
<th>Asian/Pacific Islander</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects participating</td>
<td>45%</td>
<td>14%</td>
<td>7%</td>
<td>4%</td>
<td>1%</td>
</tr>
</tbody>
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**STUDY PATIENTS**

1. **Gender:**
   - Male: 86%
   - Female: 14%

Conclusions

- Establishing a multi-city, community-based research network is a complex undertaking
- Challenges are many, yet unique to each specific site
- PBRNs can reach diverse patient populations in underserved areas that do not typically have the opportunity to be involved in research
- Motivated, research-minded providers are key
- Researchers must be sensitive to the needs of busy community practices
- Protocols must address and provide resources to providers and staff
- Ongoing assistance and troubleshooting by site coordinators is required for project success
- Research community needs to further explore collaborative IRBs to streamline and enhance the community-based clinical research process

Future Research

- A revised consensus statement on concussion in sport has been issued, summarizing the proceedings of the 4th International Conference on Concussion in Sport held in Zurich, November 2012.
- Revised assessment tools were supported, now known as the SCAT3 and Child SCAT3 (ages 5-12). Selected based on age at assessment, these new instruments will replace the SCAT2 in this protocol.
- Data collection will move forward to ascertain normative data for these new tools in children and teens.