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Background & Rationale

- Digital health tools (DHT) are increasingly used in rehabilitation, yet many fail to reach routine pediatric practice.^{1,2}
- Implementation fidelity, delivering an intervention as intended, is essential for safe, effective DHT use.³
- Optimal training approaches to ensure fidelity of DHT delivery remain unknown.

Research Question

- To what extent can clinicians independently deliver a technology-based concussion assessment tool (R2Play) according to its standardized protocol following training?

Methods

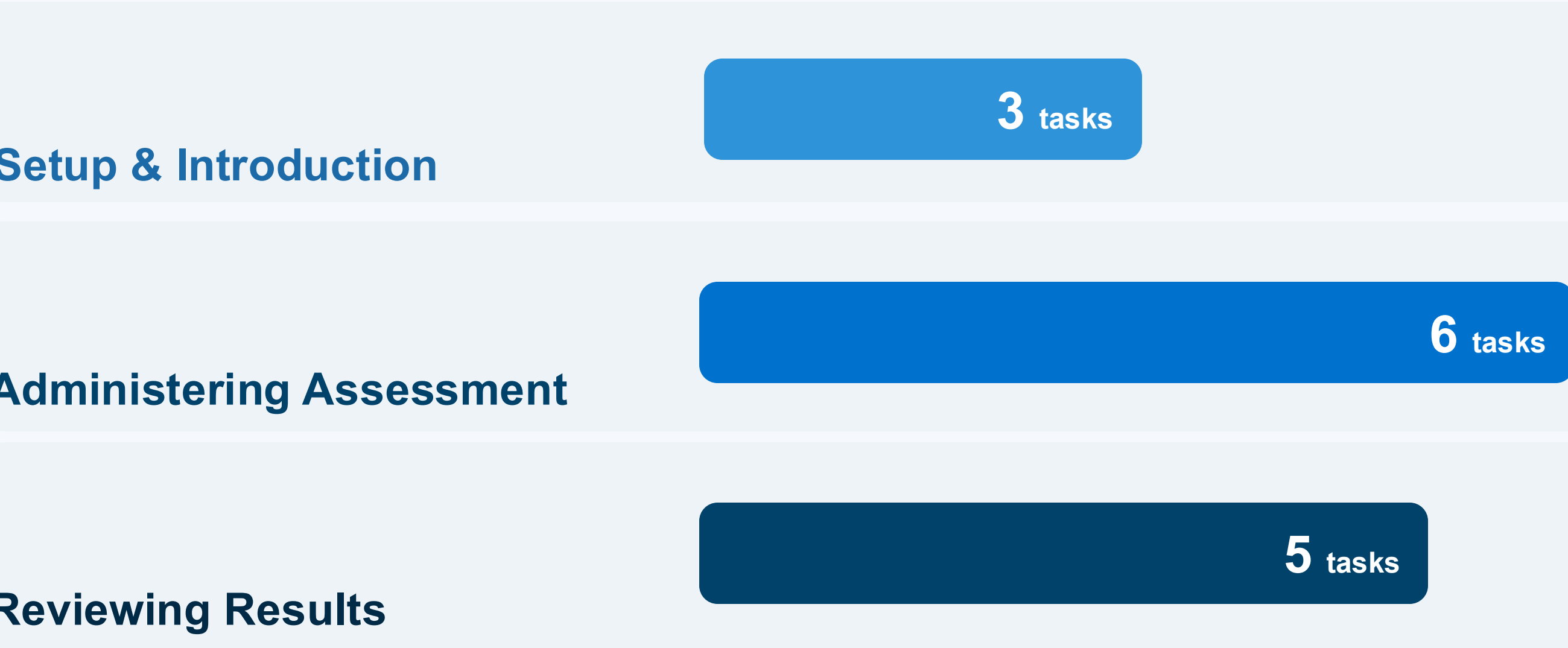
Design: Video sub-study across four Canadian concussion sites. Four sites participated in this sub-study: Holland Bloorview Kids Rehabilitation Hospital in Toronto (lead site), 360 Concussion Care Ottawa, University of Calgary Sport Injury Prevention Research Centre and Sport Medicine Centre, and Montreal Children's Hospital.

Participants: 31 clinicians.

Training: Each clinician completed standardized modules and an in-person session, then delivered R2Play to two youth participants.

Raters: Two independent scorers; discrepancies resolved by consensus.

Checklist: 14 tasks scored out of 45



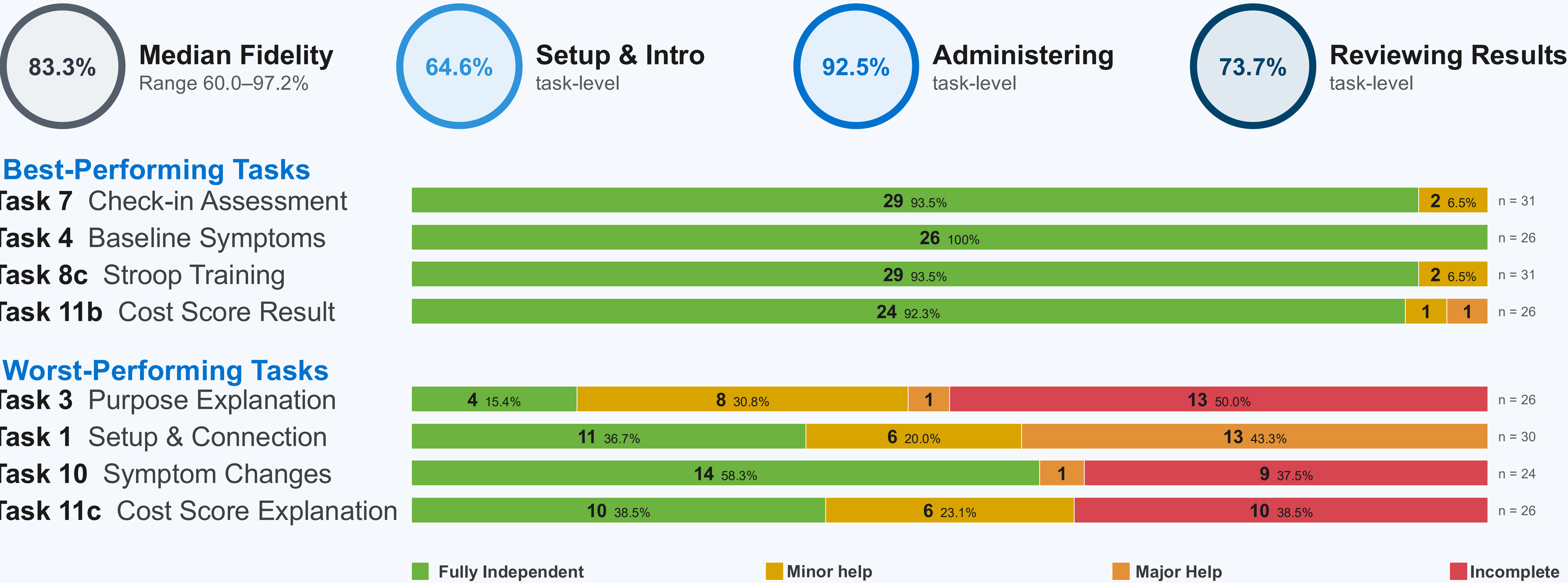
Scoring scale: each task rated 0 to 3



- Analysis:**
- Fidelity (%) = points earned ÷ maximum possible points
 - Task-level deductions flag low-fidelity components
 - Analyzed using descriptive statistics

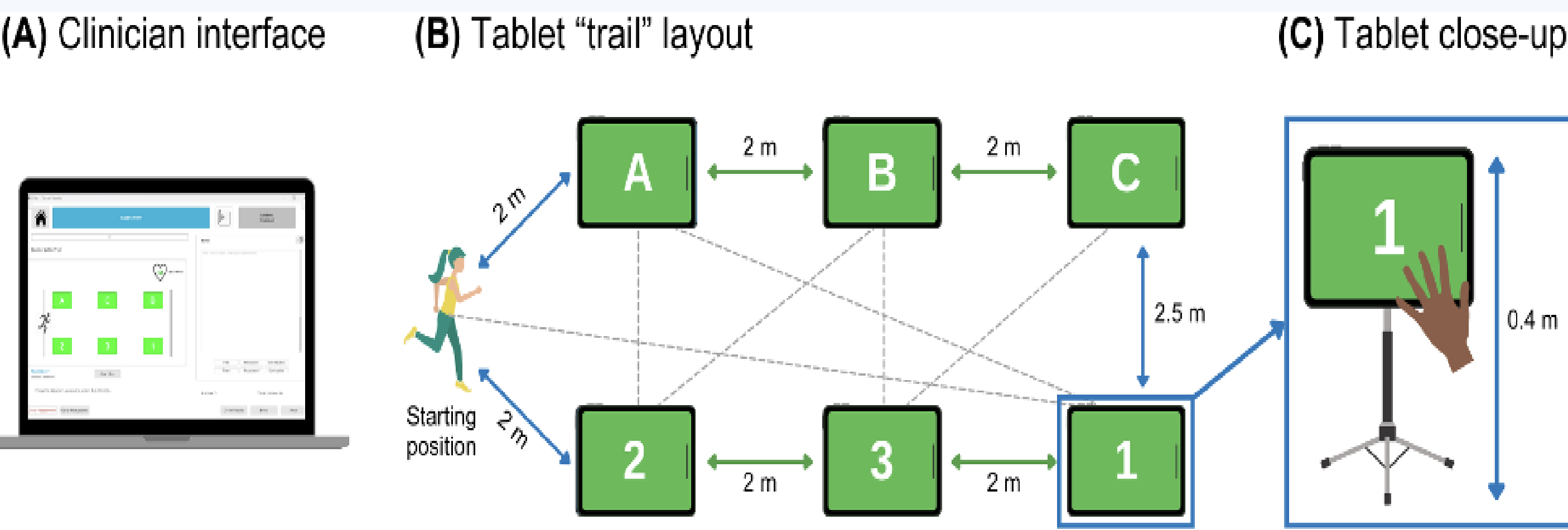
Clinicians delivered R2Play with high fidelity, demonstrating a strong potential for real-world digital health implementation. Meaningful, repeatable gaps in setup, instruction delivery, and results interpretation reveal clear targets for strengthening **DHT training and ensuring safe, consistent use in pediatric rehabilitation.**

Results



R2Play Prototype

- R2Play consists of a clinician software interface (A) and six tablets (B) displaying numbers and letters that participants run between and tap to connect a trail in alphanumerical order (i.e., 1-A-2-B...).⁴ Each tablet is fixed to a stand (C).⁵



- Performance is measured via completion time, errors, and multi-task cost scores across several levels with layered physical, cognitive, and perceptual challenges.^{6,7}

Discussion & Conclusions

- After training, clinicians delivered R2Play with high fidelity.
- Fidelity varied most in system set-up, instruction delivery, and results interpretation.
- These are clear targets for strengthening DHT implementation in pediatric rehab.
- Clinician training supports safe, consistent use of digital health tools in pediatric concussion care.
- Findings are relevant to clinical and research teams advancing technology in childhood disability.²

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References

