



ISWP Standards Working Group

September 8th, 2021 Meeting Recap

The ISWP Standards Working Group met by conference call on Wednesday, September 8th, 2021 from 12:00 p.m. to 1:30 p.m. U.S. Eastern Time. This document provides a recap.

Next call: Wednesday, December 8th, 2021, 12:00 p.m. U.S. Eastern Time/16:00 UTC

Discussion:

1. ISWP updates – Jon Pearlman, PhD

ISWP is in the process of hiring a full-time executive director and moving ISWP out of the University of Pittsburgh. We anticipate the new person and organization will be in place in early 2022. The organization transition is being led by a Founding Board, chaired by David Constantine. Shona McDonald, a Standards Working Group member, also is on the Founding Board. Current grant funding ends September 30th, 2021. An additional funding request to USAID through March 31, 2022 was submitted and is awaiting approval. The next founding round (in 2022) would be submitted by the new entity. ISWP also is working through the IP process to provide the entity a royalty-free license to permit the new organization to use the assets ISWP developed during the grant, such as test drawings and the product Wiki.

2. ISWP Wiki Wheelchair Testing Methods - Stephanie Vasquez, MS

Wheelchair Testing Centers have had two meetings to date. During the initial April 6th, 2021 meeting, the testing centers presented information on services they offer. During the second meeting (August 25th), Bill Ammer, Ammer Consulting, described a test dummy setup. The Wiki includes free resources for Testing methods and informs of available testing centers around the world.

Stephanie provided an overview of how to navigate the [Wiki](#). Standards WG members are asked to help provide this information to testing centers and complete a [survey at the bottom of the Wheelchair Testing Centers map](#).

The next Testing Centers meeting is on Wednesday, November 10, 9:00 a.m. U.S. Eastern Time/14:00 GMT. The meeting will be 1.5 hours.



3. Caster update -Jack Fried

A paper on community data (U.S. data) was recently published in *Spinal Cord* (<https://doi.org/10.1038/s41393-021-00689-3>). Data came from Labor Tracker, which reported repair claims. The data helped to identify new studies including: Bushings versus bearings (reviewing data now) and time to failure, comparing time to failure of casters in community data and lab testing. Jack presented findings from the studies. Shona encouraged testers take into account tilt and space chairs with children who have neurological disorders which create significant fatigue challenges with wheelchair parts. There is no test for the interface between the user and the chair; tests focus on where the chair hits the ground. The other impacts on the devices are not measured. The testing doesn't allow for different settings of tilt and space to be tested. Usually, it is tested in an upright position. The dynamic of the way the chair is designed for the user does not reflect its actual use. The different variations of weight in the chair isn't taken into account. There might be one chair with all of the weight in the front casters; another might not. An active chair user has a different setup. Jon acknowledges that the chairs are usually set to test at a midpoint location, not in the worst-case scenario. You know where the weight is going to be distributed. Also, ISO identifies three standards of failures; manufacturers are required to report to the FDA, which does not always occur.

Regarding time to failure, most failed within 2.5 years. One published report indicated average down time was 7 months. Shona feels ISO standards need to be modified to support low- and middle-income countries. Supplier networks see maintenance as a revenue stream, unfortunately. It still speaks to a larger issue among products which are distributed worldwide where maintenance is not provided as a service. The strongest voice could be from manufacturers.

Ultra-light chairs seem to receive preventative maintenance more often, before they would fail.

In the bushings versus bearings study (4 samples of each of 4 types) and subjected to corrosion, bushings could be a slightly better performing option.

In the time to failure samples, based on preliminary data, the lab failure was similar to the community data – a crack in the wheel at the spoke, lasting 1.5 (lab) to 2.5 (community) years. A pneumatic type tire would last about 5 years before the tire wore away. The lab and community data differed. Tilt and space chairs test differently and may require different setup for testing.

4. RR update – Holly Wilson-Jene

A paper was published after the salt fog and durability testing in *Journal of Rehabilitation and Assistive Technologies Engineering (RATE)* (<https://doi.org/10.1177/20556683211025149>). Precision accuracy of rolling resistance test versus treadmill testing was presented at the RESNA conference. There is a strong correlation but an offset in the numbers, so Holly Wilson-Jene is working on the test equipment set up to be able to test more on the top of the drum. Once modifications are complete, will retest the precision accuracy.

During the summer, an intern developed a web-based prototype of a rolling resistance calculator tool. A user can input load distribution, user weight, surface, reference set up and different types of tires/casters, which generates three options.

5. ISO Testing Equipment – Norman Reese, Le Tourneau University

Norman Reese described activities at LeTourneau related to lower-cost equipment designed for local sourcing. Students assisted Shonaquip with drum tester. Once the tester is built, it can be modified to test casters. Also described a drop tester. Test dummy and calibration chair also have been developed. Drawings will be available.

Working on an electric wheel to add to a wheelchair; working with Mark Richard's Beeline wheelchair currently. Also working on a full power wheelchair; Norm is looking for a source for a power base. Shonaquip makes bases which are modular which any seating system can be put on top; everything is mix and match. The drop tester could be done for \$500; the drum tester, for \$1,000. Shona reported the original drum test that LeTourneau developed will be fully certified within the next two-three months.

6. Group updates

6.1. ISO Testing Equipment – Norman Reese, Le Tourneau University

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6.2. Ben – GRIT

Supply chain continues to be an issue; container costs are high with Asian and U.S. shipments. Levers currently are in short supply. They are investing in MRP software to manage products and data around the products. Hired an assembly technician and plan to hire an engineer.

6.3. Keoke King

Production and shipping on the pediatric chair will occur in October. Global supply chain is a challenge for them, too.

Participants

✓	Bonnie Gonzalez, Free Wheelchair Mission		Andy Maynard, Mobility Worldwide
✓	Ben Judge, GRIT	✓	Carlos Galvan Duque, Universidad Iberoamericana
✓	Keoke King, Participant Assistive Products	✓	Isabel Bolívar, Universidad Iberoamericana
	Daniel Martin, Shonaquip		Marjelle Scheffers, BambooAbility
✓	Shona McDonald, Shonaquip	✓	Anand Mhatre
	Mark Sullivan, Convoid	✓	Jon Pearlman
✓	Norman Reese, LeTourneau University		Maria Luisa Toro
	Chris Rushman, Motivation	✓	Nancy Augustine
	Don Schoendorfer, Free Wheelchair Mission	✓	Holly Wilson-Jene
	Scott Walters, Mobility Worldwide	✓	Stephanie Vasquez
	Eric Wunderlich, Latter-day Saint Charities		Marita Brundin
✓	Jack Fried	✓	Elia Bernabeu Mira
✓	Bob Appleyard	✓	Jim Watson
	Laura Ramirez		Yetsa Tuakli, BambooAbility

Prepared by: ISWP Pitt Team

