



## ISWP Standards Working Group

### June 9<sup>th</sup>, 2021 Meeting Recap

The ISWP Standards Working Group met by conference call on Wednesday, June 9<sup>th</sup>, 2021 from 12:00 p.m. to 1:30 p.m. U.S. Eastern Time. This document provides a recap.

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

#### Discussion:

##### 1. ISWP updates – Jon Pearlman, PhD

ISWP continues to work on transitioning ISWP and its assets out of the University of Pittsburgh. ISWP is currently looking for funding to hire an Executive Director. There are ongoing activities that the University will contribute to, especially in the area of product standards. Moving forward, ISWP has a strong board of directors, and their leadership and approach are very intentional. Dr. Pearlman will continue as Founding Director until an Executive Director joins the team.

One area of focus is building capacity globally for wheelchair testing. A large network of labs has been identified, and future work will be focused to help them support each other, build additional equipment capabilities and market their services. There is a need for capacity building in wheelchair testing around globe.

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

Stephanie provided updates of the Wiki, hosted on wheelchairnetwork.org. The Wiki includes topics such as: Testing methods, Webinar resources, Wheelchair Testing Centers and Request for Contribution.

The Wheelchair Testing Centers started as an effort to engage testing labs around the world and get to know the testing completed in the different labs and locations. Several distribution means were used to reach out to wheelchair testing centers, and ~20 testing centers from 12 countries were identified. On April 6<sup>th</sup>, a Kick-off meeting was held by ISWP in which 8 centers participated. The centers were independent, and others were government-related labs that are working on the application of quality standards to wheelchairs. The testing performed at the testing centers were ISO, but also local testing was reported, such as those at Shonaquip. The initial meeting with these centers helped to identify high-tech labs that also work with power wheelchairs and wheelchair cushions. For this reason, it will be considered to expand resources available in the Wiki to accommodate these needs.

One of the highlights of the Kick-off meeting held in April was that the centers are interested in collaborating with other experts and interested in tests beyond ISO testing.





Considering every center may do their tests differently in a way, it would be important to identify where the gaps are which can support new testers to start a new testing lab. Wiki may be a good resource to clarify those processes. The next meeting will be held in August 25<sup>th</sup>, 2021. Stephanie reached out to testing centers who participated in the meeting to create an account on the ISWP website in which they would be able to also post information about their center, the testing done and their location.

### 3. Caster update -Anand Mhatre, PhD

The caster durability standard was submitted to CD balloting and may require a longer timeframe than the previous submission. The caster data analysis paper was revised and resubmitted to Spinal Cord Journal. Testing has resumed and testing of bushing versus bearings was recently completed. Testing has shown that bushings provide the same durability as high quality bearings, but they are very cost effective. This will continue to be investigated, and next steps may include exposure to dust or evaluating 3D printing of bushings. It would be possible to publish a paper on this work sometime soon. The next round of testing will include 30 casters and requires caster block fabrication. The testing will focus on matching failure modes and time to failure between community data and caster test.

### 4. RR update – Holly Wilson-Jene

A few publication and conference updates. First, the development paper by Joe Ott et al for the rolling resistance equipment was published online in Technology and Disability in May. “Development and calibration of drum-based rolling resistance testing machine for manual wheelchair components”. Next, the caster rolling resistance paper which evaluated the effects of environmental exposure has been accepted for publication by the Journal of Rehabilitation and Assistive Technologies Engineering (RATE). “Rolling Resistance of Casters Increases Significantly after Two Years of Simulated Use”. In addition, RESNA has accepted the abstract for the precision and accuracy of the RR equipment compared to system level RR testing for the July conference. “Precision and accuracy of a wheelchair wheel rolling resistance measurement system to predict wheelchair rolling resistance”

Currently equipment modifications are underway for the RR equipment in order to modify the drum location for wheel and caster testing. Parts will be arriving soon to complete this work. A summer intern recently started, who is focused on developing an online calculator tool for rolling resistance.

### 5. Group updates

#### 5.1. Free Wheelchair Mission – Don

Don is working on the soft caster to make it more tolerant for UV and environmental exposure to hot climates. He is learning about polyurethane, and the addition of stabilizers for environmental performance increases the cost, and he is working on trying to reduce that cost. They would like the casters to last 5 years. Right now, manufacturing is in China,



but they are looking at other possible locations for manufacturing, including Vietnam or India, for simpler and less expensive supply chain.

### 5.2. Ben – GRIT

Ben provided an overview of Grit junior and its development. During the downtime with Covid they decided to make a junior pediatric chair, in order to provide the same freedom chair experience to kids. They build adjustability for growth into the design, and also sought to meet the need for a hiking chair for smaller riders. Their partnership with the Challenged Athlete Foundation was important to this product development.

The development process included evaluating what had to change to meet functional characteristics, assessing measurements required for scaling down the chair and ensuring it would be compatible with adult chair accessories. They also wanted it to complement current manufacturing, at a price comparable with other products in pediatric market. It is designed to break down and fit in the trunk.

The partnership with the foundation has been great and there is a lot of excitement getting kids propelling and being outside with their families. They delivered three Grit Jr chairs to Idaho. The video linked shared by the foundation showed some very happy kids out enjoying nature.

### 5.3. Isabel Bolívar – Universidad Iberoamericana (Mexico)

Isabel is a Biomedical engineer working at the University. She works with AT, and is working to train people to recommend AT. They have been working for a few years with custom shape cushions for wheelchair users, but this work has been slowed by the pandemic restrictions. As part of biomedical engineering, they have classes for prosthetics and a lathe for making research oriented prosthetics, but no training program for prosthetics. They are really interested in knowing more about what we are doing, and if there is opportunity to collaborate in some way.

### 5.4. Keoke King

There are currently supply chain problems with materials. They hope to have it in production this summer but it is challenging. They have some factory made prototypes but still have issues. They are also working on a couple other products and will ask for feedback on those in the future.

### 5.5. Bob Appleyard

Bob shared a question he received about a seat back support relative to crash testing using a surrogate wheelchair. The changes in regulatory approach in Europe is making it



challenging to know if a surrogate wheelchair is acceptable or if accessories have to be tested on the actual wheelchair.

Another challenging situation he shared related to recent supine testing and the challenge if crash testing shows poor results, but the individual has no other option but being transported in a non-standard position in the vehicle.

### Participants

✓	Bonnie Gonzalez, Free Wheelchair Mission		Andy Maynard, Mobility Worldwide
✓	Ben Judge, GRIT		Chris Rushman, Motivation
✓	Keoke King, Participant Assistive Products		Yetsa Tuakli, BambooAbility
	Daniel Martin, Shonaquip		Marjelle Scheffers, BambooAbility
	Matt McCambridge	✓	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	✓	Isabel Bolívar

Prepared by: ISWP Pitt Team

