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## The Style Evolution of Glasses: Acknowledging Well-being for Wearable Medical Device

### Abstract

The focus of Peta Bush's work is to create wearable medical devices that address all qualities of the individual, including physical, mental, emotional, and psychosocial aspects. Peta is completing a practice-based research PhD titled "Therapeutic jewelry: The craft of people-centric devices for wellbeing." Her passion for creating wearable medical devices that are multi-dimensional stems from her personal experiences, as she has Ehlers-Danlos syndrome. In addition, she uses her knowledge of well-being and the biopsychosocial model when creating her wearable medical devices. Peta currently uses technology, such as 3D printing, as one method to fabricate her collection. Her aspirations are for this concept of wearable medical devices to become mainstream, similar to glasses, and to remove the stigma associated with wearable medical devices.

### Keywords

well-being, wearable medical devices, splint, biopsychosocial model, Ehlers-Danlos syndrome, 3D printing

### Credentials Display

Lydia Royeen, MOT, OTR/L

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“Glasses were seen as a stigma, however, [they] are now seen as a style piece,” Peta Bush candidly stated during our interview. This was a powerful statement, and her ambition and motivation were apparent throughout our discussion. Peta was explaining the style transformation of glasses, from being worn purely as a medical device to becoming a fashion statement. Peta has the same hope for wearable medical devices, such as braces and splints. Current wearable medical devices are made to serve a medical diagnosis or deficit. They minimally consider the individual as a whole or an individual’s well-being, according to Peta. This is where Peta’s passion lies: making wearable medical devices aesthetically pleasing while considering the person as a whole and their well-being, which relates to a core principle of occupational therapy.

Peta’s personal experiences have fueled her inspiration and her current career path. Peta Bush is from Hemel Hempstead, Hertfordshire, and now lives in London. She was diagnosed with Ehlers-Danlos syndrome in her late 30’s; prior to that, she had been living with her worsening symptoms, unaware of her diagnosis. Ehlers-Danlos syndrome is a hereditary connective tissue disorder that affects joints, skin, and blood vessels (Castori, 2012; Ehlers-Danlos syndrome, n.d.). It can cause widespread musculoskeletal pain, different skin features, and hypermobilization of joints (Castori, 2012).

Peta initially experienced symptoms in her teens, beginning with knee pain. Her joints became hypermobile; they did not fully dislocate but would subluxate. As a result, she experienced fatigue,

exhaustion, and chronic pain. She also had Postural Orthostatic Tachycardia Syndrome (POTS) and would faint. Medical professionals, prior to her diagnosis, told her these symptoms were psychosomatic; therefore, her symptoms were not properly managed. Peta described at one point thinking she may have Munchausen syndrome. When Peta was given a diagnosis, she felt a sense of relief.

### **Work and Personal History**

Peta described a “crash and burn” that would occur during an exacerbation of her symptoms; however, she did not allow this to impede her participation in important occupations. Throughout her life, Peta’s career has been evolving. Similar to an occupational therapist, she has learned to adapt. Once her symptoms worsened and she was no longer able to participate in her current occupation, she found another occupation to participate in with similar meaning.

Peta initially went to school and received a degree in drama to become involved with acting and teaching. However, her symptoms made this line of work difficult, and she went on to furniture making. She did this as a type of self-therapy but discovered the heavy work and labor required to create furniture was difficult for her. Peta once again adapted and chose a career in contemporary jewelry design.

Peta’s career choices have always had elements of creativity. She enjoyed her career in contemporary jewelry design, but her symptoms worsened and her fingers began dislocating. Once again, Peta was faced with a choice: to give up working or find an alternative. Peta’s new career

path incorporates her personal experiences with her instinctive creative nature.

### **Peta and Occupational Therapy**

Peta has always been involved with occupational therapy in a traditional outpatient setting, as she has worn medical devices throughout her life. She saw occupational therapists and physiotherapists for splinting and orthotic management. Splints have varying objectives and purposes for intervention; they can serve for immobilization, mobilization, or restrictive purposes (Jacobs, 2003). Immobilization splints are most common after injury or overuse, mobilization splints promote functional use in the presence of weakness, and restrictive splints limit joint mobility (Jacobs, 2003). While creating the wearable medical devices, it is important that the occupational therapist is creative and knowledgeable in understanding the clinical reasoning in fabricating the most appropriate splint (Jacobs, 2003).

Peta's experience with wearing traditional wearable medical devices is that they only consider a medical standpoint. The wearable medical devices she wore were a representation of her identity, but they were not a representation of who she wanted to be. Some of her wearable medical devices were ill fitting, and she found the devices to be stigmatizing objects.

Because of her experiences, Peta also understands an OT perspective and found it coincides with her beliefs. Occupational therapy's focus is to understand the individual as a whole.

There is great value an OT takes in the personalization of a treatment plan while promoting

function. Occupational therapists understand what it means to be all encompassing to promote well-being. According to Wilcock and Townsend (2008), everyone should be able to engage in occupations of their choosing to experience independence, equality, participation, security, health, and well-being (p. 198).

Well-being is a theme Peta refers to throughout the interview. She has a passion for well-being that resembles that of an occupational therapist. Well-being is a greatly subjective term. It has a broad scope with unclear boundaries; an occupational therapist's ultimate goal is for an individual to achieve well-being (American Occupational Therapy Association [AOTA], 2004), similar to Peta's aspirations.

### **Well-Being and the Biopsychosocial Model**

The World Health Organization's (WHO) definition of health is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (p. 1). This definition is from 1948 and focuses on a multi-dimensional aspect of an individual. Well-being is a term that is central to occupational therapy. According to the AOTA (2011), occupational therapy "addresses the physical, cognitive, psychosocial, sensory-perceptual, and other aspects of performance in a variety of contexts and environments to support engagement occupations that affect physical and mental health, well-being, and quality of life" (p. 1).

Well-being is a broad term and is often strived for in medical interventions, such as in OT interventions. Peta's experiences have motivated her desire for wearable medical device to foster

well-being as opposed to hindering it. A study conducted by Wilcock et al. (1998) sought to form a definition of well-being. The questionnaire study identified common themes. The four most common themes found in regard to well-being were being mentally sound, having a sound physical body, being happy, and being healthy.

In order to focus on the whole person, Peta borrows from the biopsychosocial model to create her wearable medical devices. Psychiatrist Dr. George L. Engel proposed this model in 1977 (Engel, 1977). It states that it is important when improving or restoring health to consider and understand the psychological, social, and physical aspects of an individual (Engel, 1977). McKee and Rivard (2011) are occupational therapists who developed fifteen guiding principles to a biopsychosocial orthotic approach. A few of these guiding principles include using a client-centered approach, considering psychosocial factors, enabling activity and participation, optimizing usability, and providing choice to the client (McKee & Rivard, 2011).

### **Peta's Recent Career**

Peta's experiences shifted her career to incorporate both art and the creation of wearable medical devices that consider a person's well-being. Peta more recently received her Master's degree from London Metropolitan University with a project-based focus. Her specific focus was to create jewelry for pain management by providing tactile and proprioceptive input to acupuncture points. A seemingly normal bracelet was not purely for aesthetic pleasure or adornment, but also to decrease pain by applying pressure to key points.

Her summer art exhibition was met with great success. The following link provides information on Peta's work: <http://www.trendtablet.com/19918-peta-bush>.

Peta began using non-traditional methods to create jewelry, specifically 3D printing, as a supplemental method to creating her artwork, since using her hands became more challenging for fine motor tasks. Three-dimensional (3D) printing is a way in which objects can be made by combining materials, such as liquids or metal, in layers to create a 3D object (Ventola, 2014). According to Ventola (2014), the use of 3D printing has great potential to add personalization, customization, and collaboration to health care delivery. There are different levels of 3D printers. There are entry-level desktop printers, Fused Deposition Modeling Printers (FDM), and more advanced selective laser sintering (SLS), which is capable of printing complex designs and shapes. The material Peta uses for 3D printing is Polyactic Acid (PLA), which is derived from plant starch and is also biodegradable.

Currently, Peta is completing a practice-based research PhD titled "Therapeutic Jewelry: The craft of people-centric devices for wellbeing" at the Sir John Cass Faculty of Art, Architecture and Design at London Metropolitan University. The focus of her work is to create wearable medical devices that address all components of an individual, including physical, mental, emotional, and psychosocial aspects.

Through the Vice Chancellor Scholarship, Peta has had the opportunity to run a small qualitative study. She wanted to expand her point

of view and held a workshop for women who have Ehlers-Danlos syndrome. Her goal for the workshop was to receive feedback on how the group perceived their well-being, how a person identifies with a wearable medical device, and general information about current problems and hopes for wearable medical devices. An example of feedback she received was for the device to allow the skin to “breathe” by not covering the entire skin surface. Peta understands the importance of how an individual feels. Similar to Peta’s approach, in occupational therapy, an individual’s subjective experience is an important outcome of the intervention (Doble & Santha, 2008).

### Current Collection

Recently, Peta completed the first phase of a larger collection. She uses a wide variety of methods and materials for her current collection. One method she uses to fabricate the wearable medical devices is 3D printing. In addition to 3D printing, she collaborates with silversmiths and cabinetmakers to create the wearable medical devices made of silver and wood in her current collection. These pieces are made to measure and are comprised of sustainable materials. Current pieces are from oak that is over 100 years old. When creating a design for a device, she makes a range of models. She uses a variety of materials, including wood, tape, pipe cleaners, and paper on her wrist and a model, in order to understand the functionality of the potential device.



### Cover Photo

The cover photo (photo credit: *Josimar Senior*) is from her current collection and is titled “Fresh Embrace,” which is named to reflect the feedback she received about wearing the device. The themes she used when creating the concept were “wearable, bearable and desirable.” In order

to make the wearable medical device, she scans the individual’s wrist and uploads it to the computer. Individually scanning the wrist ensures a proper fit. She uses a Computer Aided Design (CAD) program called Rhino. Using a FDM desktop printer, she prints the design flat. Once it is printed, she places the design in warm water and molds it around the

individual's wrist. Last, the individual has a choice of jewelry fittings to place on the wrist as well.

These include materials made of silicone, leather, cord, silver chain, silver jump rings, and PLA jump

rings. The jewelry aspect is important to provide a wide range of designs for individuals. One client chose translucent red for the fresh appeal.



## Conclusion

Peta has aspirations that new technologies will consider the well-being of individuals when making wearable medical devices. She also aspires to make her designs open source designs, meaning anyone with Internet access would be able to download the designs. She uses personal

experiences, knowledge of well-being, and knowledge of the biopsychosocial model when creating wearable medical devices. Because she had to adapt her career throughout her life, she only saw opportunity. Her hope is to promote the evolution of wearable medical devices to that of a style piece and remove the stigma.

**For more information about Peta's current work please visit:**

Peta's blog: [www.craftofwellbeing.org](http://www.craftofwellbeing.org)

Follow Peta on twitter: @shubush

**To view additional samples of Peta's work, visit:**

[http://scholarworks.wmich.edu/ojot\\_occupationandartist/](http://scholarworks.wmich.edu/ojot_occupationandartist/)

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