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# Soft gel walking stick and crutch handle and ferrule development: a collaboration between Abianco Holdings Ltd and Coventry University HDTI

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## Collaboration between HDTI and Abianco Holdings Ltd

Two usability studies; one with healthcare professionals and one with crutch users

Themes from the first usability study led to the idea of the self-articulating shock absorbing ferrule and the application of gel onto a crutch handle

Feedback from the second usability study informed the further development of the ferrule's design



## Soft gel walking stick handle-need for the product...

For people living with conditions such as arthritis and Multiple Sclerosis who may be unable to use a conventional walking stick due to the pain caused by gripping a hard, generic handle.



# Overview of HDTI input

- Initial design phase
  - Soft gel walking stick handle
- Further design work based on feedback from 2010 Naidex Exhibition
- New prototypes
- HDTI and Abianco usability assessment with healthcare professionals
- Further design work
  - Led to the application of the soft gel onto a crutch handle and self-articulating shock absorbing ferrule
- HDTI and Abianco usability assessment with end-users

# Health Professionals Usability Study

## Method

- Six physiotherapists
- Two focus groups and one face-to-face interview
- Shown Abianco soft gel walking stick handle prototypes
- Questions on design, usability, and suitability of prototypes
- Audio and video recorded for qualitative analysis

# Findings: dominant themes

- Size

*“It’s too big... The characteristics of people with rheumatoid arthritis, especially with the females, is that they tend to be very small built people. On the whole.” (Physiotherapist 2)*

- Shape

*“You are going to end up holding it down there.” [front of the walking stick] (Physiotherapist 3)*

*“I just end up here [towards front of handle], so I have to move my hand back, to get my hand in the right position.” (Physiotherapist 6)*

# Findings: dominant themes

- Rotation

*“It rotates, it moves [...]. You don't want the gel to be moving around and down, which is what it does as soon as you put weight through it.” (Physiotherapist 5)*

*“I mean you're not supposed to put a lot of weight on it are you? But people will. I think there is a risk element there.” (Physiotherapist 4)*

- Comfort

*“I do like the [gel] material; I think having something with that squidgy material is definitely good [...] it's softer to push your weight through.” (Physiotherapist 3)*

*“It does feel nice, it feels nice and springy.” (Physiotherapist 6)*

# Findings: dominant themes

- Crutch handle

Participants discussed the benefits of having gel-covered crutch handles before the researcher presented the crutch handle design.

*“Ooooh... Look at that! ...The idea of having gel on your crutch is fantastic... The main thing that we try and pad out is the crutch handles so this would be fantastic.” (Physiotherapist 6)*

*“...Ultimately, if it saves people from coming back with wrist and shoulder trouble, whatever it might be, then it’s worth it.” (Physiotherapist 6)*

- Shock absorption

Whilst the Abianco crutch was considered more comfortable, it didn’t take away the problem of pathologies caused by the impact of the crutch hitting the ground travelling through the shoulder

# Further design work conducted

Following feedback from physiotherapists:

- More work to do on the walking stick handle
- Keeping with the gel as applied to crutch handle
- New self-articulating shock absorbing ferrule designed
- Improved products presented in usability study with crutch users



# Crutch Users Usability Study

## Method

- Six crutch users
- Two focus groups and two face-to-face interviews
- Shown Abianco crutch handle and ferrule prototypes
  - Plus 'Flexyfoot' and standard (NHS issue) ferrule
- Questions on usability, suitability, and marketability of prototypes
  - Comparison with existing products on the market

# Findings: dominant themes

- Size

*“So I think the smaller ferrule [Abianco] is definitely the most attractive one.”*

*(Participant 2)*

*“I liked the size of it, I didn’t have to worry about where I put my foot, with a larger one you have to be careful.” (Participant 3)*

*“It’s subtle as well.” (Participant 5)*

- Surface area of ferrule base

*“The size of it worries me, the fact that it is so small and you’ve not got much surface area in contact with the floor.” (Participant 1)*

# Findings: dominant themes

- Shock absorber

*“Yes I liked it, it felt as though it took some of the pressure out when I was going round [...] anything that takes the pressure off when you go ‘bang bang bang’ all the time when you’re walking helps.” (Participant 3)*

*“if you are using crutches you are already dealing with a form of disability and obviously any other pain taken away from that is a bonus really [...] I think the big advantage to it is the shock absorber and I think if that removes any joint or muscular pain then I think any help with that would be fantastic.” (Participant 4)*

# Findings: dominant themes

- Articulation

*“I liked the way when walking along it actual did keep steady to the floor, it moves steadily to the floor rather than trying to slip across it.” (Participant 3)*

*“Oh yes, I see it moves! ...But it gives... it’s amazing... I can’t believe how well it does that.” (Participant 5)*

- Appearance and sound

*“it looks much more sleek... That’s it, more stylish, much more stylish.” (Participant 3)*

*“[It’s] quieter...” (Participant 6)*

# Findings: the crutch handle

- *Size and shape*

*“I think I would find that too wide.” (Participant 1)*

*“When I held it further back where the thicker part is, I thought, ‘that’s not right I need to move it more forward’ and then I felt because I had moved my hand more forward I didn’t think it would be as safe”. (Participant 5)*

- *Comfort*

*“...It’s nice to have something soft but it’s too wide... But as a handle it’s comfortable, I’ll give it that.” (Participant 1)*

# Product development and end-user input

End-user input ensures limitations of products are understood from the end-user perspective

Increased market

Lower abandonment

Abianco has decided to commercialise the ferrule

- Tooling in progress

Research will continue on crutch and walking stick handle

**Any questions?**



## Further information

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