ARAB HEALTH 2016
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Exhibition of Design, Development and Manufacturing of Scalp Cooling Cap

Exhibition Narrative By:
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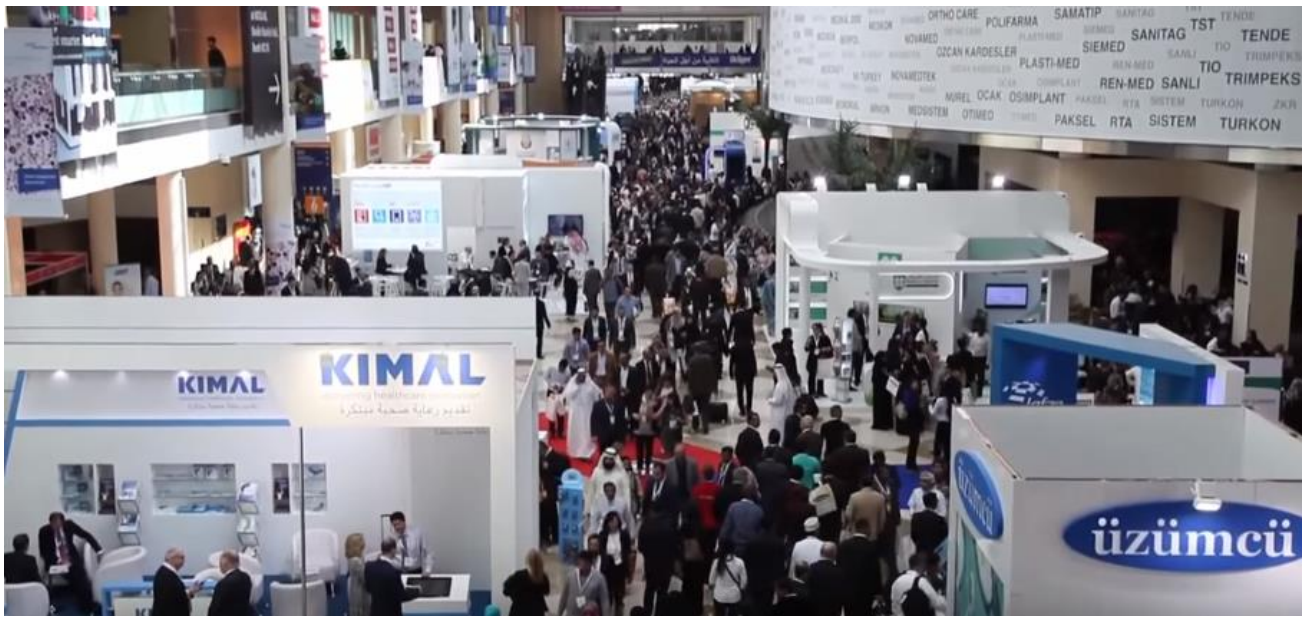
Exhibition Narrative:

University of Huddersfield and Paxman Coolers Limited showcased the output of a collaborative project that resulted in an innovative scalp-cooling cap at Arab Health 2016 Exhibition Dubai, UEA. [2]. In collaboration with Medilink Yorkshire & Humber at the Stand No: Z1G57. The Arab Health 2016 exhibition showcased more than 4,000 companies exhibiting their latest innovations to more than 130,000 healthcare professionals attending from 163 countries.

Paxman [1] engaged the expertise of researchers at two of the University of Huddersfield's academic schools. Initially funded by an Innovation Voucher from Kirklees Council, Paxman started working with the School of Applied Sciences, using its cutting-edge cell biology techniques to help identify the mechanisms that govern patients' variable responses to scalp cooling. Following additional funding from Technology Strategy Board **(**TSB) and a Knowledge Transfer Partnership (KTP), at the University of Huddersfield, the School of Art, Design and Architecture, a research team was established and has worked with Paxman since 2012 to investigate the design an development of more efficient scalp cooling cap.



Arab Health, Dubai International Convention & Exhibition Centre

Healthcare Trade Shows/Exhibitions:

Healthcare trade shows provide opportunities to connect with professionals from different sectors of the industry, to learn about new technologies, tools, and methods being used by practitioners, and to market and exhibit new medical products and devices. The healthcare industry is one of the world's largest and fastest-growing industries encompassing a wide range of disciplines in a wide range of settings. Some of the major medical exhibitions and fairs include: Compamed/Medica from Germany, Dusseldorf; CMEF of China; MD & M West – USA; FIME – USA, Miami; Medtec (Europe, Ireland, France, China, Japan); Arab Health of UAE, Dubai; BONUS: Hospitalar of Brazil, Sao Paulo and also KIMES of Korea.

Arab Health Exhibition :

The 2016 Arab Health exhibition more than 4,000 companies exhibited their latest innovations to more than 130,000 healthcare professionals attending from 163 countries. This year exhibition covered the following activities:

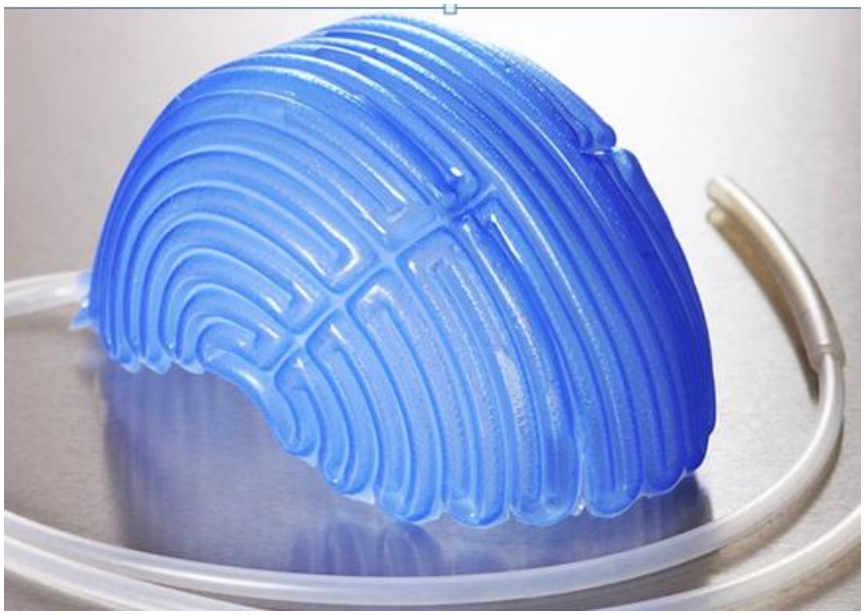
- **MedLab Middle East :** MedLab Middle East, a show dedicated for laboratory more than 500 leading laboratory companies offering a unique platform where pathologists and laboratory professionals can share their knowledge with the visitors.
- **3D Medical Printing Zone:** This zone alongside with Arab Health showcasing how 3D printing technology has affected the healthcare industry offering the visitors a unique opportunity to observe and learn from the pioneers in the field of 3D bio printing.
- **CME-Accredited Conferences:** The Arab Health Congress will include numerous sessions offering Continuing Medical Education points to medical professionals covering Image Guided Interventions Conference, Rheumatology Conference, and 3D Medical Printing Conference.
- **Pavilions :** This area host more than 25 country pavilions to boost the range of medical equipment, medical devices and medical technology on display at the exhibition.
- **Workshops:** A variety of free workshops were provided, being suitable for healthcare professionals to offer them a unique training opportunity from top international healthcare companies.

http://www.arabhealthonline.com/3d-medical-printing/

Paxman Scalp Cooling Cap Exhibited:

The Paxman Scalp Cooling System is one of the world-leading hair loss prevention systems for chemotherapy patients. It has been used by over 100,000 patients, in 32 countries and is responsible for helping patients to keep their hair during chemotherapy.

After a number of design iterations and testing of various materials, moulding methods, 3D printing materials, a number of manufacturing methods were considered and tested , the team produced prototypes and the research partner Primasil ltd from Herefordshire manufactured the design winning 4 awards so far. [3] [4] [5] [6] [7] [8]



Prototypes and the final cap

EXHIBITION:

The Arab Health Exhibition & Congress is the largest healthcare exhibition & medical congress in the Middle East and second largest in the world. Charlotte Fraser, International Development at Paxman met with some of Paxman's partners including Mr Scott Yung-Yi Tsai from Zhejiang, China and Taiwan.

Left to right: Key Opinion Leader Dr. Cheng-Ming, Peng, Director of the Da Vinci Minimally Invasive Surgery Center, General Surgery Dept., Chung Shan Medical University Hospital, Mr Scott Yung-Yi Tsai of Jiaxin and Biotech Co Ltd, Charlotte Fraser, International Development of Paxman.

The visitors informed the Paxman team that they were extremely impressed with the new cap with regards to flexibility, weight, fit and shape. Charlotte from Paxman showcasing the existing and new Paxman cold cap .

About Paxman Coolers:

Based in Huddersfield, UK, the leading global manufacturer and supplier of scalp cooling equipment for cancer chemotherapy patients

The company's history dates back to the 1950s when the beer cooler was invented by Eric Paxman, the father of Paxman's current Chairman.

Glenn and his brother Neil built the first prototype of the cooling cap which was installed at the Huddersfield Royal Infirmary in 1997.

What is Scalp Cooling?
Scalp cooling is a simple treatment that can prevent hair loss caused by certain chemotherapy drugs.

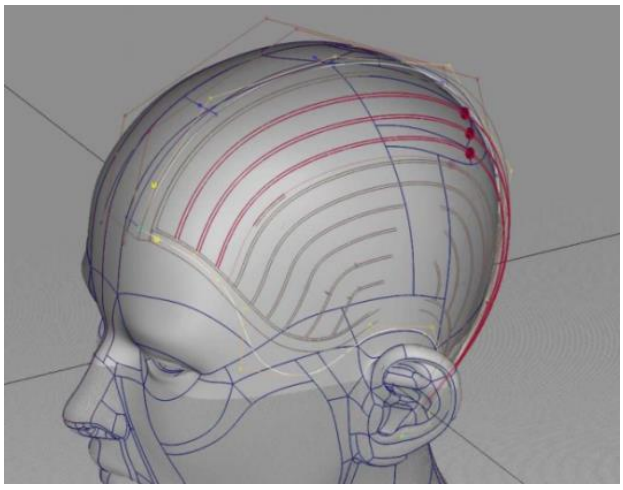
The use of scalp cooling or 'cold caps' is proven to be an effective way of combatting chemotherapy-induced hair loss and can result in a high level of retention or completely preserve the hair. For patients, this means the opportunity to regain some control, maintain their privacy and encourage a positive attitude towards treatment.

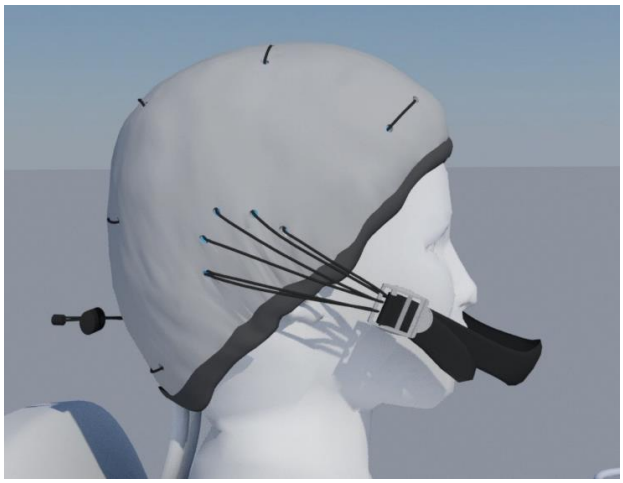
Scalp cooling system

Design Background:

The design skills and technical innovations of researchers at the University of Huddersfield have led to significant improvements in a silicon cooling cap that aims to reduce hair loss in cancer patients. Now their contribution to the project has helped earn an international award. The cooling cap has been developed, manufactured and globally marketed by Huddersfield firm Paxman, which has formed close ties – including a highly successful UK Government-funded Knowledge Transfer Partnerships (KTPs) - with experts at the University, where scientists have established the scientific basis for scalp cooling in preventing hair loss during chemotherapy. And in the School of Art, Design and Architecture, Enterprise Fellow, Dr Ertu Unver and the Product Design team have worked on major improvements to the design of the cap.

The academic team worked closely with the firm Primasil Silicones in the creation of a silicone rubber formulation that gave the cooling cap greater flexibility and enabled the coolant running through the cap to be in close contact with the scalp. Scalp Cooling Cap Design was declared the winner of the Exhibitor Innovations Competition ***Medtech World Awards 2015*** and more recently Winner of Yorkshire and Humber **Healthcare Partnership with Academia Award 2016**



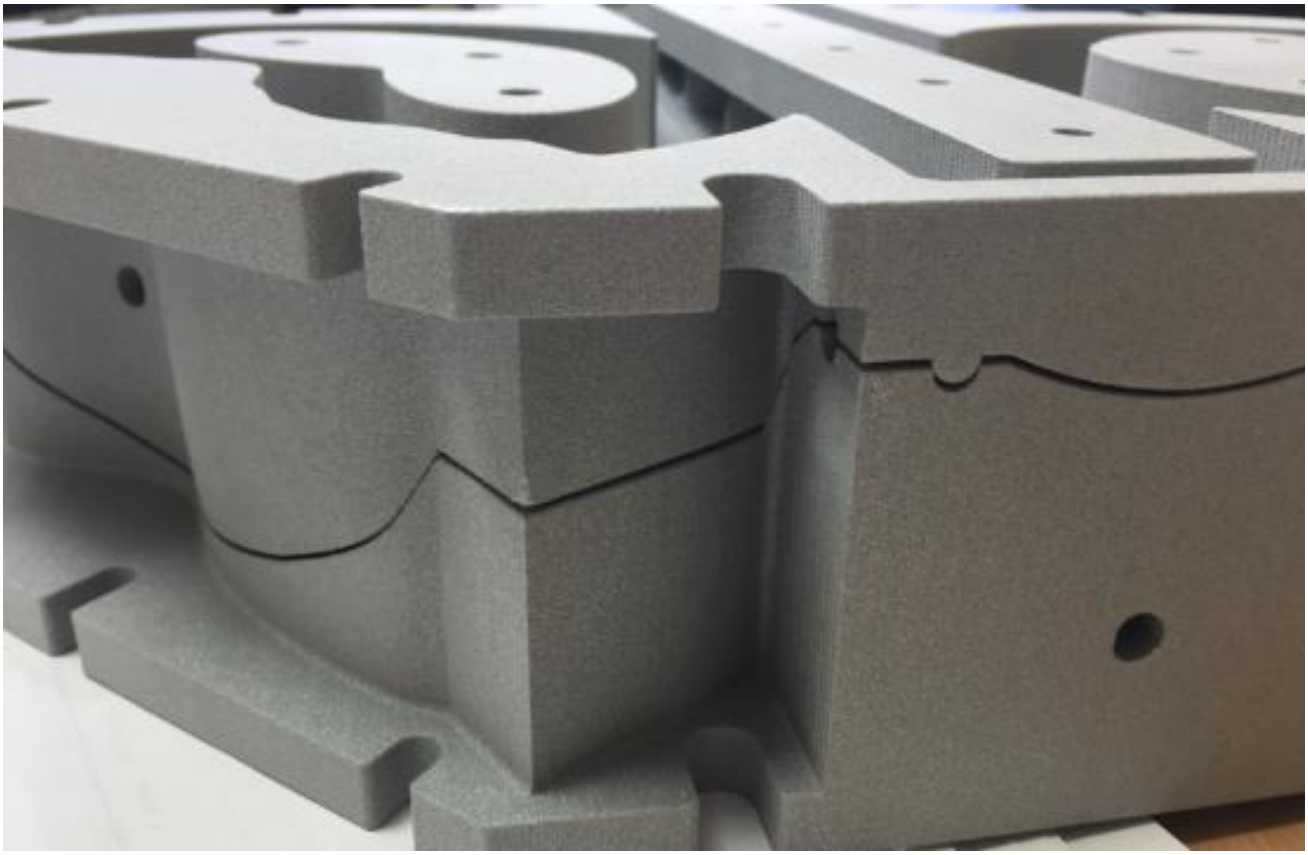


Design and Development Phase

Design and Development of Scalp Cooling Cap Device Brief

Dr Unver's brief was to redesign the cooling cap so that it is a better fit – vital if the device is to be effective – and can be mass-manufactured, making it more economical, aiding Paxman's global marketing drive. The cap developed fits the head more efficiently, despite a reduction in the range of sizes from five to three. There has also been an improvement in the flow pattern of the coolant. During the project, Dr Unver carried out extensive research into head sizes and used 3-D technology to develop a new design. Then, 3-D printing was used to create a template for the production of cooling caps in silicon. He worked closely with Primasil and, in conjunction with the firm, two patents have been applied for.

Now the highly fruitful collaboration with Paxman will carry on, as the firm seeks to make continual improvements to its cooling caps. The latest development is a new KTP – part-funded by Government organisation Innovate UK – for which Dr Unver is the academic and enterprise supervisor. The KTP associate who will carry out research at Paxman's Huddersfield HQ and at the University, is Christian Sorbie, a Product Design graduate and former student of Dr Unver. He will work towards a Master's degree during the KTP.



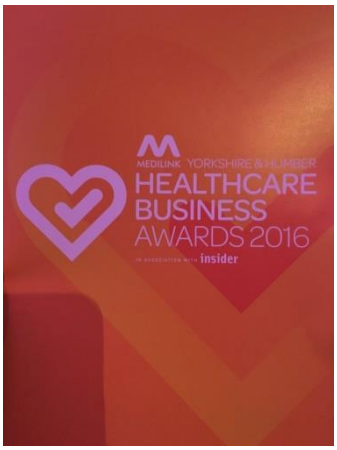
3D Printing of the tool using Laser Sintering EOS : Design and Development Phase

Conclusion:

After successfully producing a number of prototypes, and completing a number of local tests, at a number of international hospitals and dealers. The team also produced the tooling for different size caps and recently started producing mass manufactured caps. The methods and design is jointly patented [15], [16, [17]

The scalp cooling cap project shows how collaborations between SME companies and Universities can work together to produce successful, internationally recognised, award winning products. The research also helped Silicone manufacturer Primasil ltd to become one of the leading Silicone manufacturer to use state of art 3D printing for their manufacturing process. Paxman coolers also have a product which was impossible to produce using traditional manufacturing methods in the timescale and budget previously afforded.

Knowledge/skills capable of supporting community regeneration and which test University ideas/research. The final prototypes are currently being tested in a number of medical institutions in various countries including, UK, Japan, Russia. The Paxman coolers and University academics filed joint patent applications and further collaboration through Innovate UK KTP (Knowledge Transfer Partnership) research already started.



Research Team from Paxman Coolers and University of Huddersfield receiving Medilink Award, in Leeds , Armoury Museum

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Acknowledgment and the Research team:

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