



Professor Cecilia Li-Tsang, Associate Head of the Department of Rehabilitation Sciences, the Hong Kong Polytechnic University, said SPMS is the world's first pressure garment with accurately monitored pressure.

A new generation of pressure garment: **Smart Pressure Monitored Suit (SPMS)**

Pressure therapy is an effective means to treat post-burn hypertrophic scars, but there has not been any scientific research done to determine the exact pressure needed for effective treatment of different scar conditions. "Burn injury is still a major health issue in many Asian countries, including

Mainland China. Each year, there are over 300,000 clients suffering from burn injury in China and many of them have large surface of burns. After surviving the physical complications, clients still have to deal with the emotional distress due to scarring and deformities. That's why it's important to develop pressure therapy intervention in controlling hypertrophic scar at reasonable cost," explained Professor Cecilia Li-Tsang, Associate Head of the Department of Rehabilitation Sciences, the Hong Kong Polytechnic University, who is also the principal investigator behind the groundbreaking Smart Pressure Monitored Suit (SPMS) project.

Conservative treatments on hypertrophic scars

A hypertrophic scar is one that is swollen, puffy, and reddened, causing it to stand out from the surrounding skin. Professor Li states, "Conservative treatments are usually used first to handle hypertrophic scars. A doctor may inject intralesional corticosteroids to retard the growth of hypertrophic scar but it is associated with many side effects such as uneven pigmentation and atrophy of the affected area. Silicone gel dressing can also be applied on hypertrophic scars to soften the scar. Yet, they are more effective on small surgical scars than large-area wounds associated with severe burn injuries, in which cases pressure therapy is still the most effective treatment."

Pressure therapy

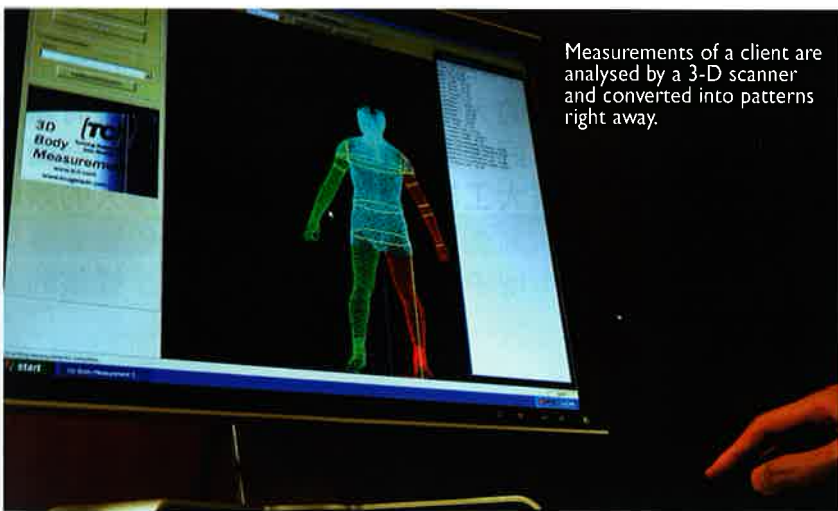
According to Professor Li, pressure therapy was a result of serendipity. "Sources have it that the Shriners Centre, the Harvard Medical School, happened to discover only clients who had bandages tightly wrapped around their burn wounds showed flattened scars. Since then, pressure therapy has been provided on a trial and error basis using elastic garment (Lycra net materials). However, applying too little pressure lessens the treatment effect while too much pressure may hinder blood circulation in the scar tissue. Therefore, it would be helpful to develop a scientific approach to find out the optimal loading onto different scar tissue and keep monitoring the pressure applied," she accounted for the rationale behind the development of the SPMS product.

Smart Pressure Monitored Suit (SPMS)

"Burn clients used to have two choices: pricey pressure garments from the U.S. which cost over US\$2,000 for a whole suit; or those cheaper ones made in Mainland China with low quality fabric and non-fitted garments. Imagine how it feels to be in such a suit 24-7," said Professor Li. So, how is the custom made SPMS different from other garments available in the market? Firstly the patented fabric is specially designed to generate pressure while being resilient; durable and comfortable. Secondly, from measurement to pattern making, the production of SPMS is fully computerized so as to provide accurate fitting garment pattern, while saving time and labour. I used to be a therapist myself and I remember spending hours on measuring and tracing the pattern on paper," she recalled. "Why should we waste expensive man-hours on something that can be taken care of by a computer?" With the introduction of SPMS, specific measurements of a human body could be obtained with a 3D scanner and converted into patterns of 3D tailoring within a matter of minutes, thus shortening the whole production lead time by nine-tenth. Finally, pressure applied to the scars can be accurately monitored and verified after fitting. "An expensive and highly sensitive system called the Pliance-x system is used to measure the interface pressure loading generated on the scars. Most pressure garment manufacturers cannot afford the system and they can never verify if the pressure is optimally applied to different parts of the body." On top of that, SPMS also has a competitive edge in terms of cost concerns. "A full-body SPMS is estimated to cost somewhat from HK\$2,000 to 3,000 which is only a fraction of its U.S. counterpart but exhibits better fitting and verifiable pressure on the scar tissues."

Commercial value of SPMS

Owing to its competitive pricing and monitored pressure, SPMS carries a high commercial value as a medical or therapeutic device for hypertrophic scars. But the potential of SPMS does not stop there. Other applications include compression stockings for prevention or improvement of varicose veins and deep vein thrombosis. "We are currently conducting a research on foot sizes of Hong Kong people. Hopefully, a range of 6 to 9 sizes of pressure stockings and socks will soon be manufactured to fit local men and women with different foot lengths and widths. Moreover, clients suffering from lymphoedema (i.e. fluid retention) due to poor lymphatic circulation would also benefit from wearing SPMS." ■ CLOTHING & ACCESSORIES



Measurements of a client are analysed by a 3-D scanner and converted into patterns right away.



Patented fabric is cut and sewn in a three-dimensional manner for perfect fit and comfort.

Acknowledgement:

Professor Cecilia Li-Tsang, Associate Head of the Department of Rehabilitation Sciences, the Hong Kong Polytechnic University.