NOVEL SCAR-REDUCING
TECHNOLOGIES BRING NEW
HOPES TO BURN SURVIVOR

PolyU's new generation of pressure garment - Smart Pressure Monitored Suit (SPMS)...

People suffering from burn injuries or other skin trauma may develop hypertrophic scars that cause loss of physical abilities and even disfigurement. Therefore, PolyU's Rehabilitation Sciences team has recently developed an innovative pressure therapy on scars - Smart Pressure Monitored Suit (SPMS). By using a 3D scanner to accurately measure human body size and a professional pattern drafting system (YUKA), the production of pressure garments can be speeded up, cutting down the queuing time for immediate treatment. The cutting-edge SPMS fabric is soft with super-stretch quality that allows excellent conformity and maximum comfort. This will boost the scar-reducing effect while giving considerable freedom of movement. While helping burn survivors return to normal life, it also alleviates vascular problems such as varicose vein and lymphoedema.

A severe burn can be a devastating injury. In the subsequent healing process, scarring may occur with the potential to cause loss of physical abilities, disfigurement, and even mobility. Through medical research and clinical studies, PolyU's Department of Rehabilitation Sciences team has recently developed an innovative medically prescribed pressure therapy garments, known as Smart Pressure Monitored Suit (SPMS), which will boost scar-reducing effect through the interface pressure, thus improving the overall quality of life for patients.

When burn injuries destroy the skin and the papillary dermis, pressure by these layers no longer exists. The lack of pressure stops the skin from working properly to repair itself, causing the formation of raised hypertrophic scars, which are red and thick, and may be itchy and painful. Pressure garments fit tightly around the scar tissues, thus creating a pressured environment and allowing the replacement of the lost
dermis from the fibroblasts. It works by applying counter pressure to the scar tissues, which prevents the body from overproducing collagen and limiting scar formation.

Taking advantages of computer technologies, the research team has devised a professional pattern drafting system (YUKA) that would speed up the production of pressure garments. The system supports standard circumference and length measurement for the pressure therapy. It uses essential measure points for made-to-measure garment providing the correct fit. It also automatically calculates the best fitting size necessary for the pressure effect based on the measurements taken and the medical conditions of the patient.

The principal investigator behind the groundbreaking SPMS project, Prof Li commented, “Conventional approach took hours or even days to make a pattern that fits individual patients. With the introduction of SPMS, a pattern can be generated in a few minutes. This is much more accurate than manual drafting.” Prof Li continued, “It cuts down the laborious work and frees up the occupational therapist for more direct case management.”

The next breakthrough in SPMS is the state-of-the-art medical fabric that provides exact prescribed pressure, being accurate to ±/− 3 mmHg. The new fabric is more elastic and durable, providing excellent conformity and significantly higher count pressure than conventional materials. This unsurpassed quality makes our pressure garments highly effective in reducing excessive collagen formation, that helps to further flatten and lighten the scar tissues. It can control the growth of hypertrophic scar, thus minimizing body deformities as a result of scar contractures.

Wearing the garment for twenty-four hours a day is necessary for persistent effect of pressure therapy. Our SPMS fabric is lighter, cooler, smoother and more breathable, which minimizes discomfort such as sweating and irritation associated with wearing the tight-fitting garment, keeping patients sufficiently motivated to wear according to directions. The material also gives a snug fit without significantly restricting movement, giving an excellent choice for unfortunate burnt children who want to maintain an active life. Unlike conventional pressure garment, our new fabric can withstand frequent stretching and washing, allowing consistent pressure application throughout the treatment, thus making it more long-lasting.

The SPMS can also be prescribed for other medical conditions such as varicose vein and lymphoedema. Prof Li explained, “Pressure stockings can help supporting better venous return of the blood vessels, thereby minimizing the effect of varicose veins causing severe pain and sometimes even ulceration. Through provision of the optimal pressure at the limbs, the circulation will also be enhanced. The swelling of limbs could be minimized for those with chronic vascular problems arising from post mastectomy and other types of surgeries.”

The SPMS marks a significant technological breakthrough that will benefit thousands of people having occupations with prolonged periods of sitting, standing or walking. This newly invented technology drew attention worldwide and won the Gold Award in the International Exhibition of Inventions, New Techniques and Products held earlier in Geneva in April 2009.