

Technology Frontier

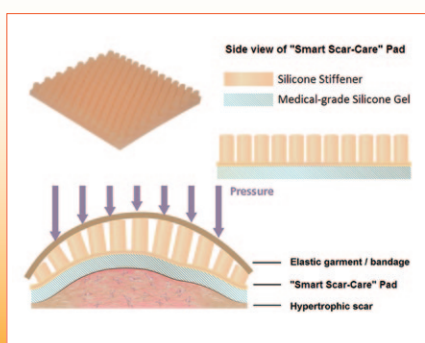
News Bite on PolyU's Innovation

Smart Scar-Care pad: for a scar-less world Treating hypertrophic scars more effectively

Hypertrophic scars that are raised and red in colour may attract unwanted attention from people and impair the psycho-social wellbeing of burn victims and post-op patients. Conventional treatment is not effective on concave surfaces and is detrimental to wearing comfort. Scholars from the Department of Rehabilitation Sciences thus developed Smart Scar-Care pad, which is not only more effective in healing and preventing hypertrophic scars, but also more comfortable to wear than conventional options.



Prof. Cecilia W.P. Li-Tsang showing "Smart Scar-Care" pad



"Smart Scar-Care" pad and its illustration

Those surviving traumatic incidents such as burn injuries or major surgery are subject to psycho-emotional distress because of hypertrophic scars – raised lumps in uneven colours that attract too much attention from others. Invasive procedures are available to treat such scars, but they involve varying levels of risk. Non-invasive methods to prevent scar formation are the preferred first-line options. Traditionally, silicone gel sheet as well as stiff and inflexible polyethylene foam are worn beneath pressure garments for this purpose. However, patients report poor wearing comfort and the method is not effective on concave surfaces of the body, such as the armpits, the inside of an elbow or the breastbone area. "That's why we have been

working on a solution that minimizes the development of hypertrophic scar on all areas of the body with a flexible material that affords improved breathability and wearing comfort," said Prof. Cecilia W.P. Li-Tsang from the Department of Rehabilitation Sciences who led a research team to develop Smart Scar-Care pad, a dressing that treats and prevents hypertrophic scars more effectively than conventional non-invasive methods.

Combining occlusive dressing and compression therapy

A hypertrophic scar is one that is raised and thickened due to excessive deposits of collagen when a wound heals. Up to 70% of patients develop hypertrophic scars after burns or surgical operation.



Case demonstration



“Smart Scar-Care” pad won a grand award and a special gold medal at the 45th International Exhibition of Inventions of Geneva.

Cosmetically speaking, a hypertrophic scar is darker and redder than normal skin because of the increased pigmentation and blood flow. It is also drier and less elastic than normal skin with reduced sweat glands and sebum secretion.

Conventional treatments for hypertrophic scars include occlusive dressing which seals the scar off from air and prevents the loss of moisture; and compression therapy which smoothens the scar with pressure. Patients are prescribed to wear silicone gel and stiff polyethylene foam underneath pressure garments for this purpose. “But it’s very difficult to secure the foam and the silicone gel sheet on the same spot all day,” said Prof. Li-Tsang. “The stiff foam may also rub against the skin to cause irritation and even blisters. This method doesn’t work on big scars that cover a large area because polyethylene foam is not flexible. In terms of cost, over-the-counter medical grade silicone gel sheet is expensive, but not durable. It is too thin and can be torn very easily. Finally, putting silicone gel, polyethylene foam and pressure garments on your skin can be quite uncomfortable in the sweltering summer. When we develop the “Smart Scar-Care” pad, we aimed at resolving all those issues.”

Faster healing and better comfort

The Smart Scar-Care pad is made up of two layers – a medical-grade

silicone gel lining that retains moisture and softens the scar; and a layer of silicone studs that apply pressure. The pad is a lot more durable than over-the-counter silicone gel – it lasts for about two months, as opposed to a few days. “Smart Scar-Care pad can be trimmed easily into different sizes to fit different parts of the body, including concave surfaces and joints. Optimal pressure can be achieved with the use of silicone studs in different heights and diameters. In our clinical trials, scars treated with Smart Scar-Care pad showed less pigmentation and vascularity, alongside more hydration and elasticity than conventional treatment. And the effect isn’t just cosmetic. The scars are less likely to itch because of better hydration. Subjects are less likely to feel pain due to hypersensitivity because the pressure desensitizes the nerve ends. All in all, it takes less time for scars to mature with Smart Scar-Care pads and subjects also report better wearing comfort and breathability,” said Prof. Li-Tsang.

In March 2017, Smart Scar-Care pad won a grand award and a Gold Medal with the Congratulations of the Jury in the 45th International Exhibition of Inventions of Geneva, Switzerland.