

Surgeons beat heat stress with 'cooling vest' invented by nursing student

November 3 2017



Credit: Case Western Reserve University

As an operating room nurse, Jill Byrne saw how heat shortened the tempers and focus of stressed, sweating surgeons.

"When even brilliant and confident surgeons look like they've been in a dunk tank, you worry about their discomfort," said Byrne, a PhD student at Case Western Reserve University's Frances Payne Bolton School of Nursing and Cleveland Clinic nurse for 31 years.

So Byrne set out to create a garment that could help reduce heat stress.

Working in her living room, she fashioned a [vest](#) from scrap draping material common in hospitals. Outfitted with pockets for re-freezable ice packs placed around the body, the garment was designed to fit under a surgical gown.

The first surgeon who wore the cooling vest showed such a dramatic change in personality, Byrne said, that he was singing show tunes and was calm, polite and clear of mind during the procedure.

"So I started sewing more," she said. "Dozens of surgeons started using them."

Byrne's push to commercialize the vest was rejected at first, but nevertheless she persisted. She returned to school for her master's degree, paving the way for her to eventually research [heat stress](#) and its damaging effects on physical and mental performance.

Heat stress is an occupational hazard for surgeons. They must keep the thermostat in operating rooms above 68 degrees—a standard set by the Center for Medicare and Medicaid Services—and that's before factoring in warmth from lights, impervious layers of protective clothing and the intense physical demands of some surgeries, such as joint replacements.

As little as 30 minutes of overheating starts to tax internal organs and is associated with weight gain, hypertension, cardiovascular disease and a hindrance on cognitive performance, according to peer-reviewed research and stress studies by the Mayo Clinic.

"When surgeons are wrapped in plastic to protect them from blood-borne pathogens, body heat can't escape. The microclimate inside the gown is not only making them miserable, it's hurting them," said Byrne, who is dedicating her PhD thesis at the nursing school to the relationship between the body temperatures of medical caregivers and their cognitive performance.

"There's such a need for this research, because you have brilliant medical minds putting their own health at risk during extremely delicate tasks to improve or save lives," she added.



Credit: Case Western Reserve University

Byrne eventually made more than 500 vests on her own time and dime, because she would hear and see the difference the vests made for surgeons.

Taking 'yes' for an answer

Encouraged by the feedback, Byrne checked back in with the innovations department at Cleveland Clinic.

Sarah Stamp, general manager of operations and administration at Cleveland Clinic Innovations, considered the vest a novel product that could potentially fill a previously unknown market need.

In a product trial at several Cleveland Clinic facilities, 97 percent of the surgeons, technicians and nurses who tested the vest said they would wear it again; it was lauded for its low cost, light weight and how its disposability does not create an additional source of contamination or laundry.

Having since secured a provisional patent, Byrne and a team from Cleveland Clinic Innovations is now working on licensing the intellectual property to a third-party manufacturer, and the vest could be for sale within a year. Working in the vest's favor is that it does not come in contact with patients and, therefore, not subject to regulatory approvals that can mire new inventions.

In May, Byrne won a Cleveland Clinic Outstanding Innovation in Delivery Solutions Award.

"Jill didn't give up, because she wants [surgeons](#) to be operating at tiptop shape," Stamp said. "While her nurturing nature makes her a great nurse, her patience and passion make her the epitome of an inventor."

Heat stress is not unique to hospital settings. Byrne also wants to adapt her design for other uses and occupations. In fact, a cooling vest she made for her grandson to wear in the dugout between innings lessened his lethargy during and after Little League games this summer, she said.

Meanwhile, she's gearing up to start her second year as a PhD candidate at the nursing school.

"I am thankful for how things are coming together," Byrne said. "But in some ways, I feel like I'm just getting started."

Provided by Case Western Reserve University

Citation: Surgeons beat heat stress with 'cooling vest' invented by nursing student (2017, November 3) retrieved 27 April 2024 from <https://medicalxpress.com/news/2017-11-surgeons-stress-cooling-vest-nursing.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.