Preserving hair a matter of temperature

Cool Caps for Chemo

By Todd Neff

A growing number of young women receiving treatment for breast cancer at University of Colorado Hospital have taken to freezing their heads.

We’re not talking Bredo Morstoel or Ted Williams-style cryogenics. This is about scalp cooling and, more importantly, about women in chemotherapy taking charge of their appearance, maintaining privacy, and feeling better about how they look during a very difficult time.

UCH is the only hospital in the state with a Rapunzel freezer, though its University of Colorado Health partners are taking interest in availing their patients of scalp cooling, too, Borges said.

Just chill. The idea behind scalp cooling, backed by a growing number of studies and anecdotal evidence from thousands of patients in the Europe, Japan and the United States, is that cooling the scalp during and shortly after chemotherapy infusion reduces blood flow to hair follicles and slows the cells’ metabolism, sharply reducing the amount of chemotherapy drug they receive and process. That way, the hair follicles stay healthy enough to hang onto the hair they produce.

Scalp cooling is not a cancer cure. But Borges said there’s a growing body of research that shows hair-loss alone brings “a substantial emotional burden especially with young women’s breast cancer.”

“For young moms, teachers, young professionals, and others, the ability to allow the breast cancer treatment to be more private than what hair loss allows is clearly showing an easing of the emotional hit that breast cancer and breast cancer treatment would bring to a young woman’s life,” Borges said.

In some cases, patients receiving the common chemotherapy drug Taxotere lose their hair permanently, Borges said. Permanent pattern baldness is a stiff price to pay for a chemotherapy treatment in one’s 20s, 30s and 40s, she said.

Borges estimates that probably 75 percent of her patients opt for scalp cooling during chemotherapy. Lynette Sykes, 41, of Denver, is one of them. Starting in June, Sykes came to the Infusion Center for weekly sessions aimed at knocking an early stage breast tumor down to lumpectomy size. For each of the first 11 weeks, she donned a Chemo Cold Cap 50 minutes before the infusion and kept one on until three hours after the Taxol stopped dripping.

Virginia Borges, MD, director of the Young Women’s Breast Cancer Translational Program at the University of Colorado Cancer Center, has been explaining the potential benefits of scalp cooling and steering patients toward Internet-based resources for about 18 months, she said. In March, the Cancer Center’s Infusion Center received a donated freezer courtesy of The Rapunzel Project, which advocates for and supports scalp cooling for women with breast cancer (the tagline of its public service announcement video: “Because when you look better, you feel better, and when you feel better, you heal better”).

Chris Sykes helps with wife Lynette’s Cold Cap during chemotherapy treatment at the University of Colorado Cancer Center. Keeping the scalp cold – and thus the hair in place – takes a team effort.
It takes two. While not requiring an advanced degree to administer, the scalp-chilling process involved more than popping on an icy cap and watching TV for five hours. That’s because Cold Cap is in fact six caps, each of which must be switched out every 25 minutes or so to maintain the minus-22 Fahrenheit cap temperature in an ambient environment.

Lynette’s husband Chris Sykes served as cap captain. His work started in the morning one day last week, when he swung by either the local King Soopers or the Reddy Ice distributor on Brighton Boulevard to pick up 80 pounds of dry ice in a cooler that came with the Chemo Cold Cap rental. Chris had brought Lynette’s half-dozen Elasto-Gel caps to the Infusion Center the night before to chill in the Rapunzel Project freezer; when the Sykeses arrived with their chest full of frozen nitrogen, Chris transferred the caps from the freezer to the cooler — that way, they could leave after the infusion finished, he said.

Back in the room with Lynette, Sykes sprayed her hair with water and put a shower cap over her head. He stuck moleskin across and below her hairline and on the tips of her ears. He folded a panty liner over each ear to further protect them. Then he extracted a Cold Cap, strapped it on her head, set a timer with an alarm, and marked the time on a spreadsheet he carried on a clipboard. In later sessions, he added a reflecting, insulating cover atop the cap, which gave each cap another five minutes of use before its return to the dry ice to chill out before the next round.

Lynette took two Tylenol or Advil about a half hour before the first cap, but exposure of one’s head to Arctic-winter chill was still “like brain freeze,” as Lynette described it.

“Some people tolerate it better than others,” Lynette said. “It was uncomfortable for the first five or 10 minutes, but once your head freezes, it becomes numb to the pain.”

Borges added that, of her patients so far, only one had discontinued with scalp cooling because of the discomfort.

The Sykeses learned a few tricks along the way. A big one was to bring an electric blanket to quell the shivering.

“Your body temperature goes down,” Lynette said. “It really helps.”

Chris said the cap-prep and swapping effort made the Infusion Center time go by faster, and he felt more engaged with his wife’s treatment.

“Instead of me just sitting here as a bystander watching the nurses work with her, I’m interacting,” Chris said. “I’m a part of what she’s going through and the healing.”

Chris had to be engaged: Infusion Center staff couldn’t offer much help.

FDA in the way. That’s because scalp cooling is not yet approved as a cancer-care adjunct by the U.S. Food and Drug Administration. A phase 2 clinical trial of a single-cap approach called DigniCap, pioneered in Sweden, is now underway at hospitals in California, New York, and North Carolina. Assuming the trial proves DigniCap’s safety and effectiveness, the makers of Chemo Cold Caps, Penguin Cold Caps and other systems should be able to win speedy approval under the banner of “substantial equivalency,” which is the FDA’s fast-track 510(k) approval process for medical devices. Scalp cooling, most likely with single-cap, continuous flow systems with built-in temperature monitoring, could then become mainstays in infusion centers around the country. But until then, hospital staff can only advise and guide patients and offer indirect assistance, said Lisa Bellamy, practice manager of the UCH Breast Center.

“Since this is a non-FDA approved program, we are not really allowed to assist the patients in any way with the use of the cold caps. We provide the freezer for them to use and have created a schedule in Epic that is mostly used by the Breast Center and the infusion center when scheduling patients for space in the freezer,” Bellamy said in an email. “We also created a one-page handout for patients that helps explain our inability to assist with cold caps so
the patient still needs to have help in retrieving the caps from the freezer and getting them on their head during the infusion.”

**Failure, success.** With ten weeks of Taxol behind her, Lynette’s hair had thinned a bit, which is typical, and she had to be extra-careful with it, washing gently once a week with organic shampoos and avoiding brushes and all caps but the cold ones. She said she looked in the mirror and saw someone who didn’t look sick. She didn’t have to tell her neighbors she was battling cancer. She didn’t get “the looks,” as she put it. She could go out to eat as a person, not a patient. It had been expensive – about $500 a month for the rental, which included the Cold Caps – but worth it. (Chris said they could have done it cheaper – buying the Elasto-Gel caps and a cooler and arranging for their own dry ice – but that this had been much more convenient.)

Then, in week 11, Lynette started four rounds of **AC chemotherapy**, a combination of doxorubicin and cyclophosphamide. Her hair started falling out – to the point that she and Chris decided to stop using the Cold Caps. Though Borges said others of her patients prescribed the same Taxol-AC regimen had kept their hair with help from scalp cooling, something about this drug and this patient had triggered a cascade of follicles. She estimates the Cancer Center’s success rate with Cold Caps to be about 95 percent. Lynette still said it was worth it.

“The best news has nothing to do with hair. With one AC session remaining, the tumor had shrunk by half. Lynette is scheduled for lumpectomy surgery in November, to be followed by radiation treatment and, if all goes well, a cancer-free future with a full head of hair.

**It’s as cold as it looks, and it has to be to chill hair follicles so chemotherapy infusions stay put.**