



SCALP COOLING WITH
the DigniCap® scalp cooling system

DIGNICAP®
BECAUSE HAIR MATTERS

Hair loss is not inevitable

Hair loss is a well-documented side effect of many chemotherapy drugs. Chemotherapy induced hair loss can be significantly reduced in most cases. The DigniCap® Scalp Cooling System offers you the possibility to keep all or most of your hair while receiving certain chemotherapy treatments for breast cancer.

Scalp Cooling – How it works

Some chemotherapy drugs can damage your hair cells. Cooling of the scalp is a proven approach to reduce chemotherapy-induced hair loss that has been used successfully by tens of thousands of patients worldwide.

The reduced temperature results in a reduced blood flow to the scalp area so that less chemotherapy reaches the hair cells. Hair cells are therefore not exposed to the full dose of chemotherapy and may be able to survive the chemotherapy treatment. In addition, cellular metabolism within the hair cells is slowed down. As a result, hair is less likely to fall out.

Introducing DigniCap® Scalp Cooling System

Scalp cooling with DigniCap® Scalp Cooling System offers you the possibility of keeping all or most your hair during chemotherapy for women with breast cancer. The DigniCap® Scalp Cooling System consists of a tight-fitting silicone cooling cap connected to a cooling and control unit. Coolant circulates through tunnels in the cap. Sensors in the cooling cap monitor and the temperature is automatically regulated during the entire cooling treatment. A safety sensor ensures that the temperature never drops below the freezing point of 32° F (0° C). To ensure optimal treatment temperature, an outer insulating cap of neoprene is used.

DigniCap® Scalp Cooling System is designed to provide continuous cooling with high efficacy, safety and acceptable patient comfort. To make this process more comfortable, the cooling cap is at room temperature when placed on the head and the treatment temperature is gradually achieved over a short period of time.



Key System Features

- Gradual cool-down of the cooling cap from room temperature provides patient comfort.
- System automatically detects and adjusts any temperature deviations based on feedback from temperature sensors integral to the cooling cap.
- Safety features ensures that the scalp cooling temperature never falls below 32° F (0° C).

Key Cap Features

- Smooth inner surface for optimal scalp contact.
- Shaped to leave ears uncovered for comfort and ease of hearing.
- Cap at room temperature when placed on the head assists comfort.
- Available in different sizes which allows the fit to be individualized.
- Quick-disconnect allows caps to be easily detached for short breaks.
- Patented dual sensor-monitored cooling compartments (in the front and back of the cap) for temperature management to ensure consistent, uniform cooling.
- Outer neoprene cap (DigniTherm™) to maintain constant treatment temperature and for optimal fit.



Considerations

(Who should use and who should not use the DigniCap® Scalp Cooling System?)

Indication for use

The DigniCap® Scalp Cooling System is indicated to reduce the likelihood of chemotherapy-induced alopecia in women with breast cancer.

Contraindications

Contraindications include cold sensitivity, cold agglutinin disease, cryoglobulinemia and cryofibrinogenemia.

Scalp cooling is contraindicated in patients with hematological malignancies, if chemotherapy is given with a curative intent.

Precautions

Long-term effects of scalp-cooling and risk of scalp metastasis have not been fully studied.

ATTENTION Clinical studies have produced variable success rates in patient reduction of chemotherapy induced alopecia with scalp cooling since the outcome is dependent on several factors including chemotherapy regimen, dose, duration of drug infusion, chemotherapy drug metabolism, and concomitant comorbidities.

Breast cancer patients treated with taxanes plus anthracyclines, when used together or in sequence, have not been shown to respond to scalp cooling for reducing chemotherapeutic drug induced alopecia. DigniCap® Scalp Cooling System should not be used in these patients.

Adverse events

Most patients tolerate scalp cooling with DigniCap® Scalp Cooling System very well. In the clinical study conducted in the U.S. for FDA clearance, three of 101 patients discontinued scalp cooling because of intolerance to the cooling.

Approximately half of the patients experienced a mild to moderate headache that was triggered or exacerbated by scalp cooling using DigniCap® Scalp Cooling System.

Mild scalp pain was experienced by the majority of the patients, but rarely required pain medications to control the pain.

Long term adverse events

When using scalp cooling, less chemotherapy is distributed to the hair cells, and cancer cells could theoretically survive locally within the scalp area. In breast cancer patients there has been a concern for scalp and skin metastases when scalp cooling patients. Based on medical literature, scalp and skin metastases are rare occurrences regardless of breast cancer stage (scalp metastases as first sign of recurrence occurs in 1 out of 4,000 patients, and in 1 out of 100 patients who already have other sites of metastasis). The observed risk of scalp metastasis does not seem to differ between patients who have and have not used scalp cooling.

Alternative Therapies

The DigniCap® Scalp Cooling System is the first device that has been granted marketing permission by the FDA to reduce the risk of hair loss during chemotherapy in women with breast cancer. However, you should discuss with your physician whether any other treatments, or the use of a wig or other head covering, would be more appropriate for you.

Summary of clinical study

Study design

A clinical study comparing hair loss in 117 breast cancer patients who used and did not use the DigniCap® Scalp Cooling System was performed. All patients had either Stage I or Stage II breast cancer and underwent at least 4 cycles of specific chemotherapy regimens. Sixteen of these women did not use the scalp cooling system and 101 patients used scalp cooling.

The average age of the women was 53.0 years (range 28 - 77); 77.4% were White, 10.4% were Black and 9.4% Asian. The most common chemotherapy regimen was docetaxel/cyclophosphamide for 4-6 cycles (75%, 76 of 89 for 4 cycles), with additional regimens including docetaxel/carboplatin (12%), weekly paclitaxel (12%), and docetaxel (1%). Docetaxel/carboplatin and docetaxel were given with HER2-targeted therapy.

The purpose of this study was to understand how well scalp cooling reduced hair loss. The women in the study evaluated hair loss by comparing before and after photographs of their hair using the Dean Scale.

Dean Scale:

- Grade 0: no hair loss
- Grade 1: > 0 up to 25% hair loss
- Grade 2: > 25 up to 50% hair loss
- Grade 3: > 50 up to 75% hair loss
- Grade 4: > 75% hair loss

Success was defined as a maximum Dean score of ≤ 2 using standardized photographs graded by the patient up to 4 weeks after the last chemotherapy treatment.

Patient satisfaction with using scalp cooling was evaluated with the Alopecia Self-Report questionnaire. Quality of Life and Body Image was evaluated using the EORTC-QLQ-BR23 Questionnaire and the Body Image Scale respectively.

Alopecia Self-Report Maximum Dean Score (Evaluable Population)

Dean Score	Patients using DigniCap®	Control patients
N	101	16
0(No Hair Loss)	5 (5.0%)	0 (0.0%)
1(Greater than 0 up to 25% Hair Loss)	31 (30.7%)	0 (0.0%)
2(Greater than 25 up to 50% Hair Loss)	31 (30.7%)	0 (0.0%)
3(Greater than 50 up to 75% Hair Loss)	19 (18.8%)	1 (6.3%)
4(Greater than 75% Hair Loss)	15 (14.9%)	15 (93.8%)

Of the 101 women in the study who used the DigniCap® Scalp Cooling System 67 women (66.3%) lost less than half of their hair, when followed for a month after the last chemotherapy cycle. In comparison, 16 women (100%) in the control group lost more than half of their hair.

Success rate was also analyzed by chemotherapy regimen. In patients who used DigniCap® Scalp Cooling System, success was documented in 83.3% ($p=0.022$) of patients receiving docetaxel/carboplatin, 60.5% ($p<0.001$) of those treated with docetaxel/cyclophosphamide, and 83.3% ($p=0.066$) of patients treated with a taxane alone. Success rate did not differ when analyzed by hair thickness, history of previous chemotherapy, median age, median body mass index, use of prior hormone replacement therapy, and menopausal status. At one month after the last chemotherapy treatment, almost half of the women who had used the DigniCap® Scalp Cooling System reported that they never used a wig, cap, scarf or other head cover due to hair loss.

Patient satisfaction

Patients in the study filled out an Alopecia Self-Report questionnaire. Results clearly showed that 101 patients who had an average of 3.6 cycles of chemotherapy and used DigniCap® Scalp Cooling System were satisfied with the decision to use scalp cooling and expressed higher satisfaction with their hair quantity and hair quality as compared to controls. The patient reported satisfaction score (0 to 100), showed a mean score of 87.5 satisfaction with the decision to use scalp cooling, a mean score of 70.9 for hair quantity and a mean score of 69.1 for satisfaction with hair quality.

In patients using DigniCap® Scalp Cooling System, the Alopecia Self-Report questionnaire results showed thick hair in a mean 0.7 study cycles and no change in hair texture in 1.8 study cycles.

In contrast, the 16 patients in the control group had an average of 1.5 cycles before discontinuing reporting due to hair loss. Patient reported satisfaction score (0 to 100) of 25.6 for hair quantity, and a mean score of 37.6 satisfaction with hair quality. Alopecia Self-Report results indicated 0.9 cycles with no significant change in hair texture.

Quality of Life and Body Image

Compared to patients who used the DigniCap® Scalp Cooling System, a greater number of patients in the control group had dry mouth, different than usual taste in food and drink, eyes were painful, irritated or watery, lost hair, upset at hair loss, felt ill or unwell, had hot flushes, had headaches, felt physically less attractive or less feminine due to the disease or treatment from baseline at the last cycle of chemotherapy and the one month follow-up.

Women who used DigniCap® Scalp Cooling System agreed strongly that hair is important for appearance at the baseline (82.2%), last cycle of chemotherapy (80.2%) and one month follow-up (78.7%), while women in the control group agreed strongly that hair is important for appearance at the baseline (50.0%) and the last cycle of chemotherapy (50.0%) and 66.7% at one month follow-up.

Adverse events

Six women reported 7 adverse reactions caused by the DigniCap® Scalp Cooling System. These were headache (4 women), itchiness (1 woman), pain of skin (1 woman) and head discomfort (1 woman); none of these reactions were rated severe and one headache was the only reaction rated moderately severe and the rest were mild.

Three of 106 women discontinued use of scalp cooling because of cold discomfort, while 102 out of 106 women had a feeling of chilliness during the cooling down period.

Less than half of the women (43/106) reported that headaches were triggered or exacerbated by scalp cooling. Although headaches occurred, they were not reported at every cycle of scalp cooling.

Conclusion

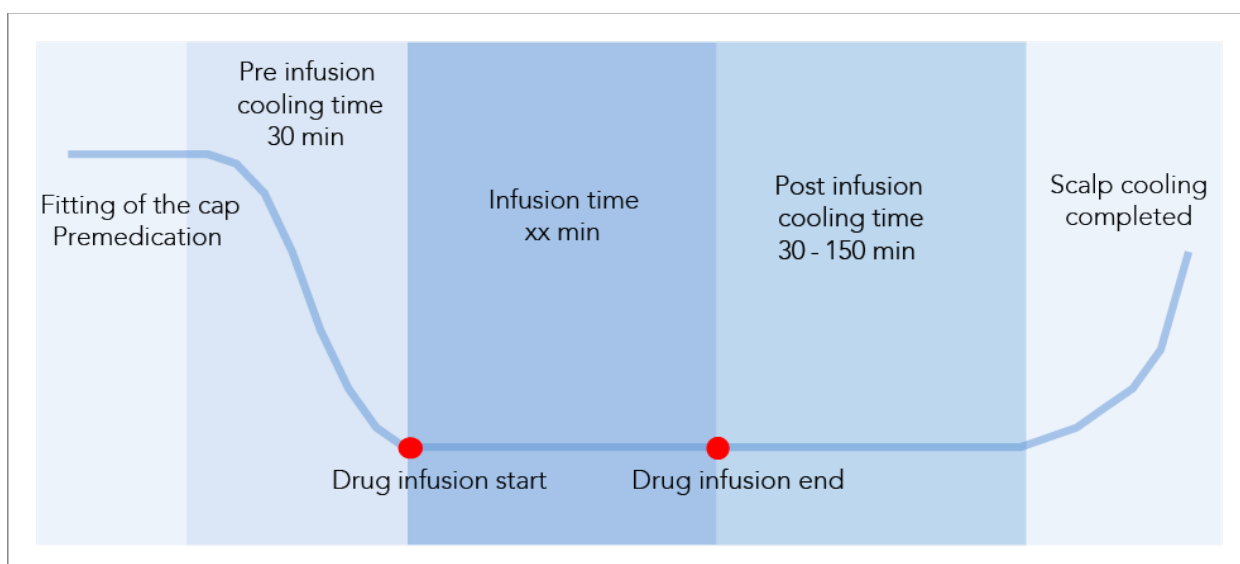
Overall, the DigniCap® Scalp Cooling System appeared to be safe and well tolerated with only mild discomfort associated with the scalp cooling and effective in reducing the likelihood of chemotherapy-induced alopecia.

Description of treatment with DigniCap® Scalp Cooling System

DigniCap® Scalp Cooling System will be used at each cycle on the day of chemotherapy administration.

The cooling cap will be placed on your head 30 minutes before starting the chemotherapy treatment (pre-infusion cooling time). You will then continue to wear the cap during the chemotherapy infusion (infusion cooling time), and for a set period after the completion of chemotherapy treatment (post- infusion cooling time). Depending on drug and dose, the post-infusion cooling time will last for 30- 150 minutes. When the treatment is completed, the cap is kept on for 15 minutes as the cap warms up to diminish any discomfort.

The Scalp Cooling Process



The silicone cap is connected to the cooling and control unit, therefore you are required to stay next to the system during the scalp cooling treatment. It is possible to disconnect the cap from the system for short breaks, e.g., for rest room visits. During the break, the cooling cap with its outer neoprene cap remains on your head.

Scalp Cooling with DigniCap® Scalp Cooling System - Step-By-Step

STEP 1 CAP SIZING AND FITTING

It is important that the silicone cap is fitted very closely to the scalp (i.e., over the entire area of hair). Any air trapped between the scalp and the cap has an insulating effect, which may negatively affect the cooling and results. To ensure a good fit you will try different sizes of caps, before the first scalp cooling treatment. The cooling cap is available in four different sizes, XS, S, M and L.

Recommendation: During the scalp cooling treatment the number of breaks from cooling should be held to a minimum. It's recommended that you go to the rest room before you start scalp cooling.

STEP 2 WETTING THE HAIR

Before fitting the cap, wet your hair thoroughly with water to improve the thermal contact between your scalp and the cooling cap. Once wet, comb your hair flat.

Recommendation: Wash your hair with a gentle shampoo at home prior to the scalp cooling/chemotherapy session. Greasy hair may affect the thermal contact.

STEP 3 APPLYING THE COOLING CAP

First the silicone cap is applied and then the neoprene outer cap is placed.

STEP 4 CONNECTING THE CAP TO THE COOLING UNIT

The cooling cap will now be connected to the cooling and control unit.

STEP 5 COMMENCEMENT OF THE SCALP COOLING TREATMENT

Once the cooling cap is connected to the system, the scalp cooling treatment can begin. The cooling and control unit is operated by the hospital personnel.

When the treatment starts, the temperature on the scalp gradually decreases from room temperature to the target temperature of 37-41° F (3-5° C).

STEP 6 COMPLETION

After completion of the post-infusion cooling time, the cooling cap remains on your scalp for another 15 minutes to allow the temperature to slowly increase to diminish any discomfort. Avoid a sudden increase of temperature by letting your hair dry naturally.

FAQ

Why does chemo cause hair loss?

Chemotherapy affects cells that are in the phase of division or growth. All the cells in the body are affected by chemotherapy for breast cancer, not just the cancer cells. This means that even healthy cells, especially cells with a high growth rate, such as your hair, are likely to be affected by the chemotherapy.

When would I use the DigniCap® Scalp Cooling System?

The DigniCap® Scalp Cooling System will be used in women with breast cancer during each cycle of chemotherapy administration.

Will scalp cooling work for me?

Almost everyone can expect to experience some degree of hair loss during chemotherapy. Scalp cooling is an effective method for reducing the risk of chemotherapy-induced hair loss in women with breast cancer. The outcome is dependent on several factors including the chemotherapy regimen, dose, duration of drug infusion, chemotherapy drug metabolism, and concomitant comorbidities. Scalp cooling has been evaluated mainly with regimens including anthracyclines (such as doxorubicin and epirubicin) and taxanes (such as paclitaxel and docetaxel). It's not always possible to know how effective the scalp cooling outcome will be until you try it. The effectiveness of scalp cooling with chemotherapy regimens that include sequential anthracycline and taxane chemotherapy has not been well studied. Your clinician can tell you if scalp cooling is compatible and/or successful with your treatment.

How long does scalp cooling treatment last?

The scalp cooling device is operated by hospital personnel and will be used during each chemotherapy session. Scalp cooling begins approximately 30 minutes before chemotherapy starts, continues during the infusion, and must continue for a set period after the conclusion of treatment depending on the chemotherapy drug and dose, typically 30-150 minutes post infusion. After completion of the post-infusion cooling time, the cooling cap remains on your scalp for another 15 minutes.

How does it feel?

Most patients tolerate scalp cooling with DigniCap® Scalp Cooling System very well. Common side effects include a feeling of coldness, headache, scalp pain and/or light-headedness. Your doctor can provide a pain reliever if you develop a headache.

What should I bring with me to the hospital on the day of the scalp cooling treatment?

Your clinician can best tell you what you should bring on the day of the treatment. It's recommended that you bring your own wide tooth comb.

How should I take care of my hair?

DigniCap® Scalp Cooling System offers you the chance of minimizing hair loss during chemotherapy for breast cancer, but chemotherapy could cause scalp irritation, make the hair dry and brittle and more difficult to manage.

Practical recommendations to minimize hair loss during chemotherapy in conjunction with scalp cooling:

- Wash your hair at home prior to the scalp cooling/chemotherapy session. Greasy hair may affect the thermal contact. However, avoid daily shampooing (to avoid wear of the hair), shampoo less if your hair feels dry.
- Use lukewarm water (avoid hot water) and gentle shampoo.
- Avoid applying heat to hair with appliances such as blow-dryers, curling irons, straightening iron, and hot rollers. Let your hair dry naturally as much as possible.
- Avoid harsh chemicals that can lead to dry hair, breakage, progressive hair thinning and hair loss such as the following:
 - Peroxides for hair coloring
 - Perms to curl or straighten hair
 - Parabens (such as methylparaben and propylparaben) are chemicals that are used as preservatives
 - Sodium laurel sulfate is a foaming agent and will remove natural oils in the hair
 - Silicones that are used to tame or "de-frizz" the hair work by coating the hair strands
- Limit brushing or combing hair. It's recommended that you use a wide tooth comb.
- Avoid hair accessories such as rubber bands and headbands that pull on the hair.

PRO-20090316-03-US

Latest revision date: 4/15/2016

DigniCap® is a product of Dignitana AB, a public, Swedish medical device company. DIGNITANA, DIGNICAP, DIGNICARD, DIGNICOOL, DIGNISTICK, DIGNITHERM and DIGNILIFE are trademarks of Dignitana AB (publ).

REGISTERED TRADEMARKS: DIGNITANA, DIGNICAP and DIGNILIFE are registered trademarks owned by Dignitana AB (publ). For a comprehensive and up-to-date list of trademarks, registered trademarks, patents, please visit our website: www.dignitana.com