

Hand and feet cooling device to prevent  
Chemotherapy-Induced Peripheral Neuropathy  
(CIPN)

# Design For Health

**Collaborative Project 2021-22**

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## STAKEHOLDERS

# The Challenge

Clinical presentation of CIPN can include numbness, tingling and pain in the hands and feet. Long term complications such as chronic pain and persistence of symptoms can lead to decreased quality of life, impairment and disability in cancer survivors.

There are currently no effective pharmacological strategies for prevention or mitigation of symptoms of CIPN. As cancer survivorship increases, a greater focus on preventive approaches will be necessary to try and improve patient outcomes.

Recent studies have shown that peripheral cooling may help to reduce the severity of CIPN.

The project aims to design a hand and feet cooling device which can be used during chemotherapy, which can last up to 4 hours at a time. The solution will need to reach a therapeutic temperature of ~18 degrees Celsius.



### **Primary : Chemotherapy Patients**

Chemotherapy patients have to deal with a wide variety of side effects while also trying to understand the complex journey of chemotherapy; this can be overwhelming and can lead to feeling out of control. The prospective product will allow the patient to feel in control of the possible side effect, CIPN. The product will be designed to encourage better adherence, resulting in a higher chance of a positive outcome.



### **Secondary : Chemotherapy Nurses and Staff**

Nurses, alongside the rest of the chemotherapy team, have a number of roles: patient assessment, patient education, direct patient care, symptom management and supportive care (Kufe, et al., 2003). Nurses are vital in the integration of cryotherapy into patient care. The prospective product will aid nurses to carry out quality patient care; allowing the nurse to educate, monitor, support and provide care to the patient to a high level within the time and staffing capacity of the ward.



### **Tertiary: NHS and wider Government system**

The product will be procured through the NHS. Chemotherapy side effects, such as CIPN, can affect a patient's ability to return to work. A recent report showed that a third (33%) of respondents to a 2013 survey stopped working permanently or temporarily, and 8% worked reduced hours or took unpaid leave (MacMillan, 2013). This causes a reduction in productivity resulting in an economic cost. Reduction or cessation of chemotherapy, and the need to try alternative treatment plans, will lengthen the patient's cancer treatment, increasing their time out of work.