Proposed Design Presentation

1) What does the proposed design look like?

-We are making a device that is a **thermograph,** an instrument for measuring temperature, to predict **meledema**, the swelling of the limbs
-the hypothetical design is similar to a **binder clip**
-the binder clip includes a miniaturized pi, a temperature sensor, a small battery, a thin plastic coating with LED lights, and a non invasive adhesive
-the clipping technology prevents the device from falling off easily
-all materials (learned about in class) are yet to be determined

2) How/Where will your design be worn?

-the clip works in combination with compression socks and will clip on to the top of the stocking
-the clip has an adhesive for direct contact with the skin
-the adhesive technology is water resistant and will not interfere with temperature readings, and it enhances temperature reading accuracy

3) How and in what way is your design expected to be used?

a) looking at the condition:
-CVI: Chronic Venous Insufficiency
-Chronic venous disorders are **complex**, **disabling**, and **costly**, resulting in an estimated $1 billion to $3.5 billion in US for treatment of its complications
-Calf muscles and muscles in the feet need to contract with each step to squeeze the veins and push the blood upward
-To keep the blood flowing up, and not back down, the veins contain **one-way valves**
-when these valves become damaged blood begins to leak backward
-what happens when blood leaks backward?
-overlying skin takes on a reddish-brown color and is very sensitive to being broken if bumped or scratched
-swelling occurs in the lower legs and ankles
- pooling can cause local tissue inflammation and internal tissue damage
-the swelling overtime can cause venous stasis ulcers, which can be difficult to heal and can become infected overtime
-When the infection is not controlled, it can spread to surrounding tissue, causing cellulitis

b) how our design can prevent this:
-pain from swelling can be relieved by **elevation** or **compression**
-a change in temperature in the legs is associated with inflammation
-our proposed idea is to associate **temperature dysregulation** with **chronic inflammation**

-studies have shown that elevation of approximately 2.2º C (4º F) above baseline should serve as a warning sign for inflammation caused by blood pooling
-the temperature sensor clip will use a baseline (established upon a week of wearing the clip) to detect this change
-the severity of the change will depend on the temperature rise
-based on severity, a repeated flashing LED light of a corresponding colour (yellow or red) will go off
-At the same time, a notification (an email) will be sent to the user
-based on a temperature deviation, an according message will be send either related to elevation of the legs, appropriate exercise movements, or an indication that more compression needs to be applied in the leg

Side note: HOW CAN WE ELIMINATE EXTERNAL TEMPERATURE FACTORS FOR THIS?

4) A preliminary plan for verifying correctness(p.t. to physical computing prototype)

**yall idrk what this means rip
-store daily averages keep including it in the baseline

NOTES:

Orientation with a temperature component
-accuracy? Some sort of baseline
-an array of 64 degrees
-use more accurate hardware
-compression stockings - uncomfortable
-does it need an adhesive
-knee high kind?
-according to anatomy?
-below the knee compression stockings
-pressure amounts?
-secondary use: long plane flights
-stasis for long duration periods
-suffer from blood pooling
-sitting on an airplane
-any role for sitting a long time
- what if someone is wearing boots??
- preventative of disease
-treatment mechanisms
-while wearing compression socks or the absence
-not as much pooling bc of compression socks
-can’t have 2 sensors
-diff high socks
-an ankle strap
-a strap instead

-a calf; where does the pooling occur
-measure the calf

-Need a method of calibration
-step into a cold room hot room adapt to the situations of the user
-software?
-some kind of a brace
-something made in the compression sock
-deviation is the same?
-how do we get around external factors
-suction cup
-recalibrate button

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