# Wearable devices to prevent hypotension/syncope and chemotherapy-induced hair loss

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## Technology description

The purpose of this invention is to ameliorate the positional drop in blood pressure in patients with orthostatic hypotension and recurrent vasovagal syncope and related symptoms from that decline in blood pressure such as dizziness and syncope.
Stanford researcher Dr. Bryant Lin has developed compact wearable devices that use vibration to promote vasoconstriction and thereby treat a variety of conditions depending on where the patient’s blood flow is altered. Vasoconstriction localized to extremities could be used to ameliorate orthostatic hypotension (positional drop in blood pressure) and prevent syncope/dizziness along with its associated injuries. Vasoconstriction localized to the scalp could be used as an alternative to cooling to prevent chemotherapy-induced hair loss. In the hypotension device, the vibration can be activated shortly before standing to avoid elevating blood pressure while sitting or lying down (a side effect seen with drug treatments for syncope). For the hair loss application, the device would be easier for patients to use than current cooling systems. It does not require bulky equipment and can be turned on during chemotherapy infusion without preparation time (unlike the 30 minutes of precooling needed for cooling caps). In both applications, the timing and intensity of the vibration could be dynamically controlled either manually (with a switch or a trigger) or automatically (with position or physiological sensors).

## Application area

Wearable device to promote vasoconstrictionfor treatment of:
orthostatic hypotension and vasovagal and neurogenic syncope , such as dysautonomia caused by Parkinson’s disease, dehydration or medication chemotherapy-induced hair loss - as an alternative to scalp cooling or in conjunction with scalp cooling

## Advantages

For hypotension/syncope application:
active/dynamic control - unlike support stockings which provide the same pressure regardless of patient position, this device can be controlled (either manually by the patient or automatically by position or physiological sensors) adjustable - device could provide feedback to adjust the intensity of

vibration depending on patient response localized, physiological therapy - limited side effects compared with pharmacological treatments that elevate blood pressure when the patient is not standing
For chemotherapy-induced hair loss application:
compact device - all components can be integrated into a cap with a power source, unlike cooling caps which require extra bulky equipment fast preparation - effects on vasoconstriction occur shortly after the device is activated, unlike cooling caps which can require over 30 minutes of precooling time to achieve maximal vasoconstriction

## Institution

Stanford University

## Inventors

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