

# The Brain Pulse Project

## Normal Pressure Hydrocephalus

### Pilot



Normal pressure hydrocephalus (NPH) is a disease in which an excessive amount of fluid accumulates in the brain. It usually occurs in older adults and develops slowly over time. NPH produces dementia like symptoms that can be similar to those of Alzheimer's disease and causes walking problems similar to those of Parkinson's disease. However, unlike Alzheimer's and Parkinson's, NPH can be reversed in many people with appropriate treatment. But first it must be correctly diagnosed. The diagnosis of NPH is that ultimately culminates in the need for a large needle in the back (lumbar puncture or spinal drain). The brain pulse project is trying to make this process quicker and more reliable.

The 'brain pulse' is a name coined by ourselves to describe a pulsing of the fluid pressure inside the head. In most people the brain has a small pulse but in NPH we know it can be much larger. Measuring a patient's brain pulse is expected to be a good way to diagnose NPH and may be a really good way to predict how effective a patient's treatment will be. However currently, there is very little research in this area because brain surgery is required to insert a monitor in the head in order to measure the brain pulse reliably. The objective of the brain pulse project is to test a new very simple way of measuring brain pulses without brain surgery. The study is using measurements from a headphone like ear plug that we can place painlessly and safely into an ear.

With the money that we received from Smile 4 Wessex we have been able to show that we are able to measure a pulse from patients with NPH. This was a really important step that has helped us to learn the best way to do it. We proved that we are able to make measurements from patients easily and it is as simple and as comfortable as we thought it would be.

That evidence helped us to win a big grant from the government that we have just finished using to measure the brain pulse in over 300 healthy volunteers. The next step will be to make more measurements from a large number of patients with NPH in order to compare their brain pulses with healthy subjects. This will then tell us how reliable the measurements will be in the diagnosis of NPH.