The Art of Breathing
Anxiety and hyperventilation

Dr Ashley Conway:
What I'm interested in looking at, with the subjects that I work with. Is to examine how and what's going on in their mind, influences their breathing and their carbon dioxide levels.

Narrator:
The tube beneath the subjects nostril is linked to a device which monitors carbon dioxide levels in her exhaled air. It produced a separate peak for each breath.

Dr Ashley Conway:
What I would like to do to start off with, is just to have a couple of minutes, just with you sitting quietly reading. You can have this very interesting journal article. And if you can just sit..

And I'd like you just to go back and remember exactly what you felt. Just go back and remember for example when you were taking off. You were strapped into your seat. You could hear the noise of the engines accelerating. You could feel the back of the seat pushing into your back, as you thrust along the runway. Just remember what that feels like. And remember what you could feel inside. Remember the different feelings and sensations that you had going on inside at that time.

Narrator:
Hyperventilation causes rapid removal of carbon dioxide from the lungs. Initiating a corresponding fall in blood acidity.

An oxymeter attached to her finger reveals two important consequences of over breathing. First of all heart rate goes up. Secondly the oxygen carriers in the blood rapidly become fully saturated. This is because haemoglobin releases oxygen to the tissues less easily, as blood acidity falls. It's one cause of the dizziness associated with hyperventilation.

Dr Ashley Conway:
That's good. Just sit quietly for a few moments.

Narrator:
a Scan across the top of the neck taken during normal breathing can be processed to give a measure of the rate of flow in blood vessels passing to the brain. In hyperventilation, flow rates are significantly reduced.

Further processing of the data produced peaks, which are proportional to the flow rates in the various blood vessels during normal breathing and during hyperventilation.

With reduced blood flow and lower oxygen release, it's no wonder that hyperventilation leads to dizziness and fuzzy thinking.

Dr Ashley Conway:
If we manipulate our breathing by slowing it down, by getting calm rhythmic breathing, and by raising the $C^{o}2$ level, we can often help ourselves to feel very calm. To feel very peaceful and to help ourselves think more clearly.