

## Speech!

Jon Stamford

Despite being the complex organisms that we are, we take much of this function for granted. As with the old adage that all is well “as long as you have your health”, so it is with speech and language. We never think to question their integrity until these faculties are, in some way or other, impaired or lost entirely.

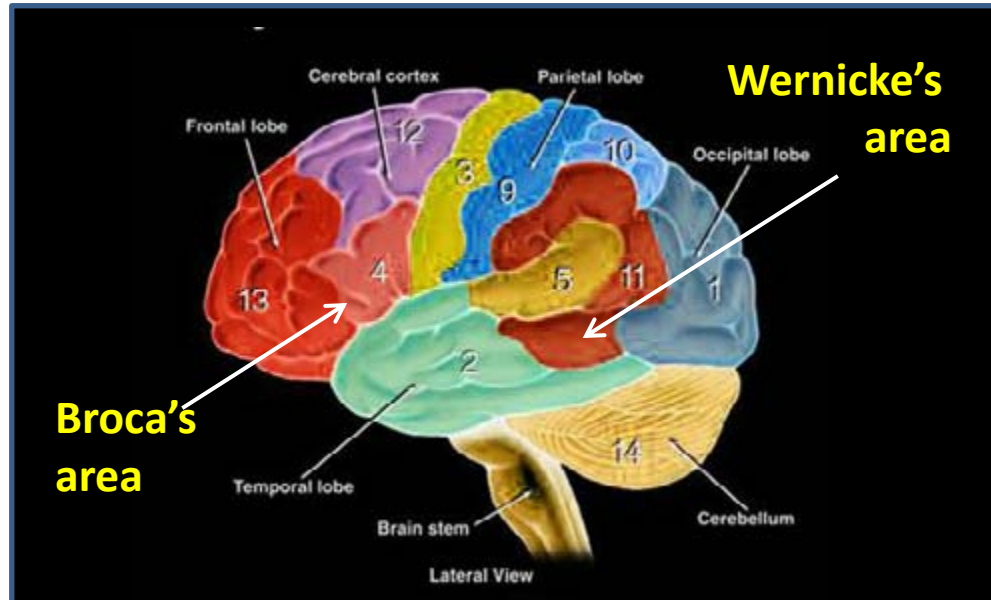
Speech, essentially the principal vocal means of communication, is itself dependent on both the production and reception or perception of sound.

Despite the evident complexity of human speech and thus the tendency to assume it to be unique to our species, animals of course also communicate vocally. Whales in particular have elaborate communications.

Not surprising perhaps, bearing in mind its innate complexity, speech can be compromised by conditions which affect many systems.

Damage to hearing for instance removes a critical feedback loop in the production of speech and makes resulting speech flatter. Similarly damage to the vocal cords drastically affects or even eliminate speech.

But the majority of conditions that modify speech have effects on the brain.



## The anatomy of speech

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Two particular areas of the brain, in both cases named after the neurologists who elucidated their role, are critical speech centres. These are Broca's and Wernicke's areas of the cerebral cortex. Damage to each of these areas causes different types of damage to speech. For instance damage to Broca's area mainly affects speech production, resulting in slow fragmentary speech. But patients with this pattern of damage have no loss of comprehension. A very different pattern is found when damage is centred on Wernicke's area. Patients with this pattern of injury lose the capacity to understand language but, bizarrely, can still produce fluent albeit nonsensical speech.

## Speech and PD Jon Stamford

People with Parkinson's are well known to have problems with speech. Perhaps most common is a simple reduction in the loudness of the voice. But slurring speech and stuttering are also common speech phenomena in Parkinson's. In extreme cases, this can reach a stage of near aphasia. In some cases, the treatments for Parkinson's may influence speech production. For instance, deep brain stimulation can, under certain circumstances, affect speech although this may depend on the electrode positioning and stimulation parameters.

For many patients with severely impaired speech, this represents one of the biggest losses. Several of the articles in this issue touch on speech, its production and the changes in speech associated with progression of the illness. Others describe the means by which speech may be improved, repaired or even restored to near pre-illness days.