


Research
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Curricula



**Dementia: The Ageing
Brain and the Role of
Participatory Arts**
Key Stage 4 Psychology
Resource 3

2019



Resource Three Overview



Topic	Dementia on the Brain: What happens when the brain does not function as it should? Part 2: Other types of dementia
GCSE Modules	Biopsychology, memory, cognition and development
Objectives	By the end of this resource, you should be able to: <ul style="list-style-type: none">✓ Define different types of dementia✓ Differentiate between how each different type of dementia affects the brain differently✓ Compare and contrast between the different types of dementia
Instructions	<ol style="list-style-type: none">1. Read the data source2. Complete the activities3. Explore the further reading
Context	Alzheimer's disease is only one of many types of diseases and conditions that can cause dementia symptoms to appear. Alzheimer's may be the most common, but it is important to highlight the other ways that brain damage and deterioration can lead to dementia symptoms. The following data source is informed by material published on the Alzheimer's Society website and Professor June Andrews' book 'Dementia: The One-Stop Guide'.

Resource Three

Data Source



Section A

Vascular Dementia

Compared with other forms of dementia, vascular dementia is more variable and affects wider sections of the brain. Although vascular dementia can be caused by a range of different diseases or health events, all of these diseases affect the blood supply to the brain. You can remember this by bearing in mind that the word 'vascular' is associated with blood vessels and circulatory fluids. The symptoms can generally appear much more suddenly than with Alzheimer's, often due to the aftermath of a stroke. June Andrews differentiates between Alzheimer's disease and vascular dementia in the extract from her book:

'One of the biggest differences between vascular dementia and Alzheimer's dementia lies in the underlying disease process. In Alzheimer's the brain shrinks relatively slowly as individual brain cells die back and so the symptoms creep up over time. In vascular dementia there is a distinct moment when the blood vessel gets blocked by a clot. That's more likely when there is narrowing of the blood vessel caused by thickening of the wall where fat deposits have gathered. The symptoms of vascular dementia depend on which part of the brain has been damaged' (Andrews, 2015: 30).

Below are some types of vascular dementia and accompanying scans:

a) Multi-infarct dementia: the most common form of vascular dementia where many mini strokes affect lots of different areas of the brain. Refer to image A of a normal aging brain, while image C shows multi-infarct dementia (sourced from bnr.org). Symptoms are dependent on where the damage is caused in the early stages. For instance, if a mini stroke affects the hippocampus, then episodic memory may be affected, while a damaged frontal lobe may affect executive function, decision making and planning.

Resource Three

Data Source



Figure 8
Normal brain scan

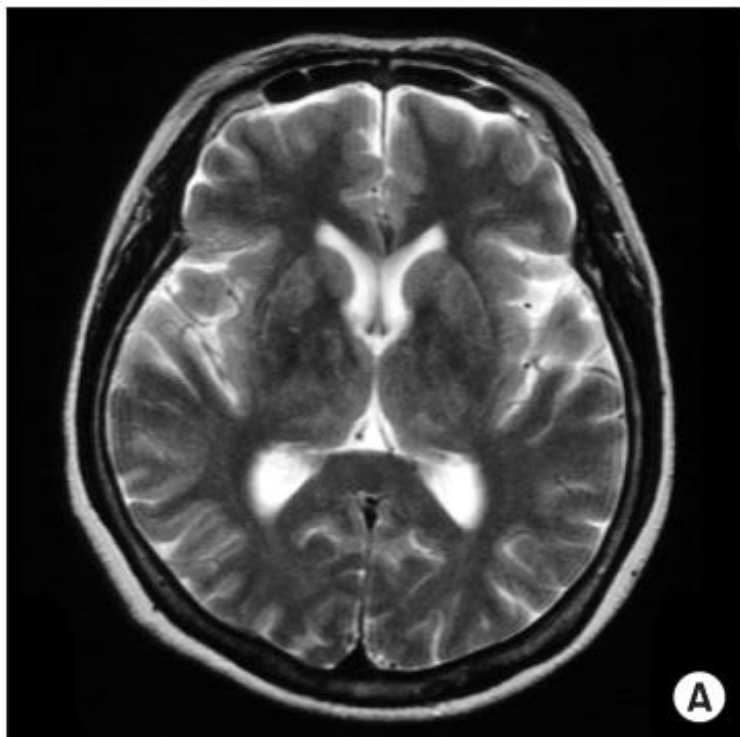


Figure 9
Multi-infarct dementia



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Data Source



b) Subcortical vascular dementia or Binswanger's disease: when blood vessels deep inside the brain at the subcortical level are damaged by a stroke. This damages the white matter deep in the brain, beneath the cerebral cortex, in addition to signals typically sent to the frontal lobe. Therefore, a vast range of symptoms can occur, including problems with slowed thinking processes and executive functioning, lack of facial expression, difficulty walking and speech difficulties.

Figure 10

Normal brain scan

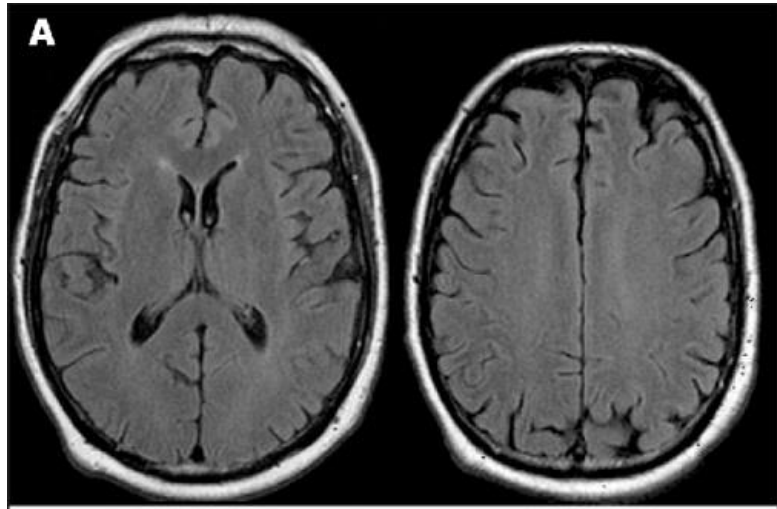
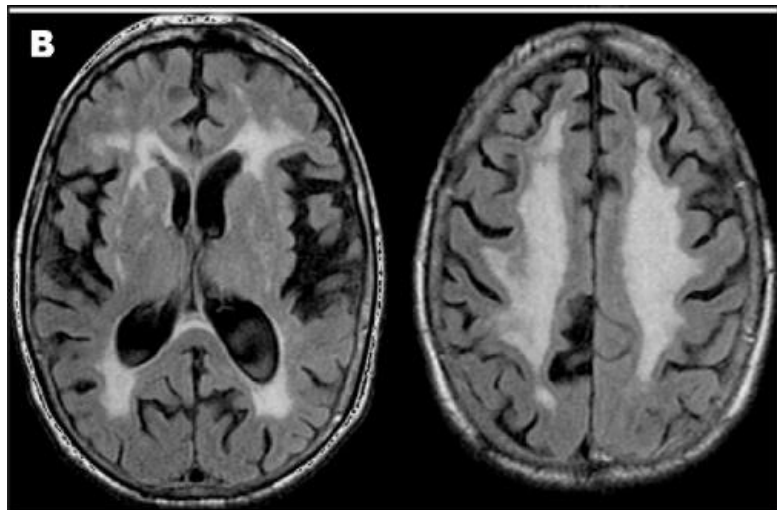


Figure 11

Subcortical dementia



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Data Source



c) Dementia can also follow after a major stroke, where a larger part of brain tissue is damaged, and the typical motor and movement-based outcomes of stroke will occur (e.g. more pronounced damage down one side of the body and speech difficulties) in addition to planning, memory and thinking problems. Rehabilitation can assist in recovery, unlike other types of dementia causes.

It can be very difficult diagnosing one type of dementia from another. According to Andrews, "about 10 per cent of people with dementia have a mixture of vascular disease and Alzheimer's" (p 31). This statistic gives a small insight into how overlapping neurodegenerative conditions can be!

Section B

Dementia with Lewy Bodies

This cause of dementia is not as common as Alzheimer's and vascular disease but is distinct in its effects on the individual with it. Similar to the plaques and tangles responsible for Alzheimer's disease, Lewy bodies are made up of a form of protein that create tiny clumped deposits in the brain, particularly in the cerebral cortex, limbic system and brain stem. Unlike Alzheimer's, however, there is less overall shrinkage of the brain. Lewy bodies dementia has a lot of overlap with Parkinson's disease, given that the Lewy body clumps are similar to the abnormal proteins in the brains of those developing Parkinson's. Because it is a rarer form of dementia, it is often difficult to diagnose. The development and diagnosis of Lewy bodies can go in typically two ways:

The person develops Parkinson's disease first and it is common for those with this disease to later develop dementia with resemblances to Lewy bodies dementia.

The person develops dementia with Lewy bodies first, but given its rarity, it is difficult to diagnose and therefore may be incorrectly diagnosed as Alzheimer's in the early stages.

Resource Three

Data Source

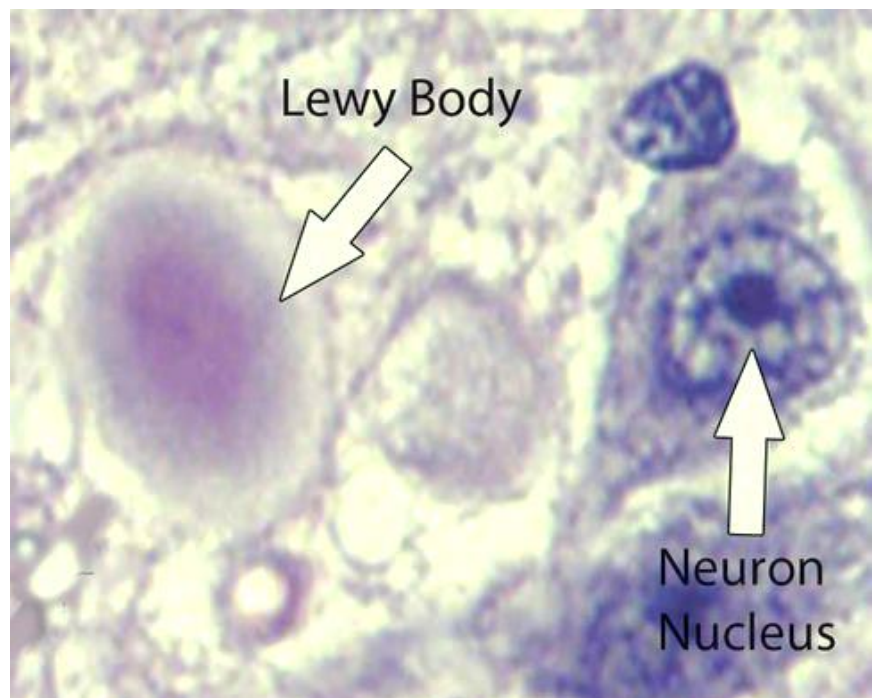


Early symptoms of dementia with Lewy bodies often involves damage to visual pathways and the frontal lobe of the brain, impacting a person's vision, perception and attention.

Lewy bodies in the brainstem will have effects on movement, similar to the stiffness and shuffling movements that are common in Parkinson's disease. Damage to the limbic system may result in memory problems and issues surrounding emotional expression.

Figure 12

The presence of Lewy bodies in brain tissue



Section C

Frontotemporal Dementia

Dementia of the frontotemporal type is the last of the four most well-known diagnoses, although it is not as common. It consists of a wide range of conditions that all have the same brain locations in common – the frontal and temporal lobes. For more information on the role and function of the frontal and temporal lobes, revisit material in Resource 1. In general, behaviour, emotions, memory and language are affected by damage to the frontotemporal sections of the brain.

Resource Three

Data Source



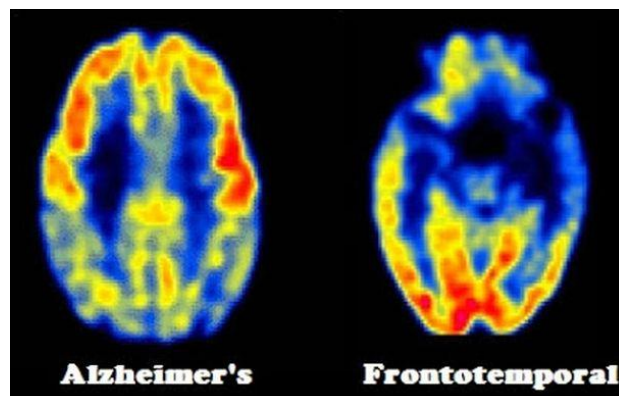
Shrinkage occurs in these lobes due to a build-up of abnormal tau proteins clumping together in small areas, leading to the loss of nerve cells and the degeneration of neural networks in the affected areas. This is similar to the shrinkage effect that accompanies Alzheimer's disease, although it typically affects all areas of the brain gradually. There are different names and sub-types of frontotemporal dementia which may reflect different patterns of damage. The most common are as follows, according to the Alzheimer's Society (2019):

Behavioural variant frontotemporal dementia: "...the areas of the brain affected early on are in the frontal lobes. For example, damage to the upper middle surfaces of the frontal cortex is linked to becoming withdrawn and losing motivation...damage to the frontal lobes may also mean the person repeats the same word, phrase or action over and over again."

Semantic frontotemporal dementia: "...the front of the left temporal lobe, dealing with verbal semantic memory, is damaged first. So the person may have fluent speech but struggle to find the right word for something, or they may ask what a familiar word (e.g. 'knife') means. Damage to the right temporal lobe leads to problems recognising faces and objects".

Frontotemporal dementia is also often experienced by people with motor neurons disease.

Figure 13
PET scan of two
different causes of
dementia



Resource Three

Activities



- Activities**
1. Why is dementia with Lewy bodies often difficult to diagnose?
 2. What can lead to vascular dementia? Give some examples of how vascular dementia may develop.
 3. What are the main differences between behavioural-variant frontotemporal dementia and semantic frontotemporal dementia?
 4. In the following table, write down some key words that help you differentiate between the four main types of dementia. I have completed an example for Alzheimer's Disease.

Type of Dementia	Keywords
Alzheimer's Disease	Plaques; beta-amyloid; tangles; tau; hippocampus; memory; shrinkage; amygdala; visual system; frontal lobe; limbic system.
Frontotemporal dementia	
Dementia with Lewy bodies	
Vascular dementia	

Resource Three Activities



Activities

5. Write a short essay on the four main types of dementia, comparing and contrasting their symptoms and the parts of the brain that are affected (you may need to refer back to Resource 2 for guidance on Alzheimer's disease).



6. Get creative! Using the information provided in Resource 3's data source, write a creative piece (such as a short poem) or draw an image that illustrates some aspect of dementia symptoms or disease. Once completed, in no more than 200 words explain what your creative piece is about.

Resource Three

Further Reading



Explore



Read

Follow up with the data sources that informed the above resource:

'Symptoms of Alzheimer's disease' web article by Alzheimer's Society.

<https://www.alzheimers.org.uk/about-dementia/types-dementia/alzheimers-disease-symptoms#content-start>

Read Professor June Andrew's book 'Dementia: The One-Stop Guide':

Andrews, J (2015). Dementia: The One-Stop Guide. London: Profile Books LTD.

A journal article from a scientific journal about the behavioural and psychological symptoms associated with different kinds of dementia:

Chiu, M. J., Chen, T. F., Yip, P. K., Hua, M. S., & Tang, L. Y. (2006). Behavioral and psychologic symptoms in different types of dementia. *Journal of the Formosan Medical Association*, 105(7), 556-562.

Watch

Living with Dementia: To Be or Not To Be | Yvonne van Amerongen | TEDxWarwick

[TED Talk - Dementia: To Be or Not To Be](#)



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100 Black Prince Road
London, SE1 7SJ



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