



# NeuRA

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SCHIZOPHRENIA LIBRARY

## SCHIZOPHRENIA Factsheet

October 2020

### What is whole brain volume and functioning?

Investigation of whole brain anomalies considers the collective volume of the entire brain in structural imaging, without considering regionally specific differences in the volume of any individual structures. Alternatively, whole brain imaging can also consider overall grey matter or white matter volume. Whole brain functioning assesses the degree of connectivity across multiple brain regions.

### What is the evidence for whole brain volume and functioning?

#### Structural changes

Moderate quality evidence found lower brain weight in people with schizophrenia compared to controls. Moderate to low quality evidence found male patients who died by suicide had significantly heavier brains than male patients who died of natural causes. Increased male brain weight was associated with younger age of schizophrenia onset.

Moderate to high quality evidence found people with schizophrenia who were medicated or not medicated showed reductions in intracranial, whole brain grey and white matter, and total brain volume compared to controls. Cortical volume was reduced only in medicated patients. People with first-episode schizophrenia also showed reduced intracranial, whole brain, and grey matter volume. First-degree relatives of people with schizophrenia showed reduced total grey matter volume compared to controls, with no differences in white matter or whole brain volume.

#### Functional changes

Moderate quality evidence found decreased local organisation and small-worldness (balance of local organisation and global integration) in people with schizophrenia. There was reduced connectivity within the default network (self-related thought), the affective network (emotion processing), the ventral attention network (processing of salience), the thalamus network (gating information) and the somatosensory network (sensory and auditory perception). There was reduced connectivity between the ventral attention network and the thalamus network, the ventral attention network and the default network, the ventral attention network and the frontoparietal network (external goal-directed regulation), the frontoparietal network and the thalamus network, and the frontoparietal network and the default network. There was increased connectivity between the affective network and the ventral attention network.

For more information see the technical table



## NeuRA

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*NeuRA (Neuroscience Research Australia) is one of the largest independent medical and clinical research institutes in Australia and an international leader in neurological research.*

*Diseases of the brain and nervous system pose the greatest health, economic and social burden of any disease group because they are chronic, debilitating and have no known cures.*

*Medical research is the cornerstone of efforts to advance the health and wellbeing of families and the community. Our dedicated scientists are focussed on transforming their research into significant and practical benefits for all patients.*

*While we hope you find this information useful, it is always important to discuss any questions about schizophrenia or its treatment with your doctor or other health care provider.*

### HOW YOUR SUPPORT HELPS

We are able to make significant advances due to the generosity of countless people. Your donation allows us to continue to work towards transforming lives. For information on how you can support our research, phone **1300 888 019** or make a secure donation at [neura.edu.au/donate/schizophrenia](http://neura.edu.au/donate/schizophrenia).

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