

# Neurocognitive Impairment Associated with Heart Failure



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## BACKGROUND

- Up to 80% of persons with heart failure (HF) experience cognitive impairment.
- Decreased cardiac function leads to reduced systematic blood flow contributing to altered cerebral blood flow homeostasis and subsequential neuropsychological changes associated with clinical and subclinical brain injury.
- The etiology of cognitive impairment in HF and the relationship between HF and cognitive impairment are complex.
- Left ventricular assist devices (LVADs) are increasingly used for advanced HF management.

## AIMS

- Describe indicators and mechanisms of cognitive impairment in HF.
- Identify causes of HF-related cognitive impairment.
- Discuss cognitive changes after LVADs implant.

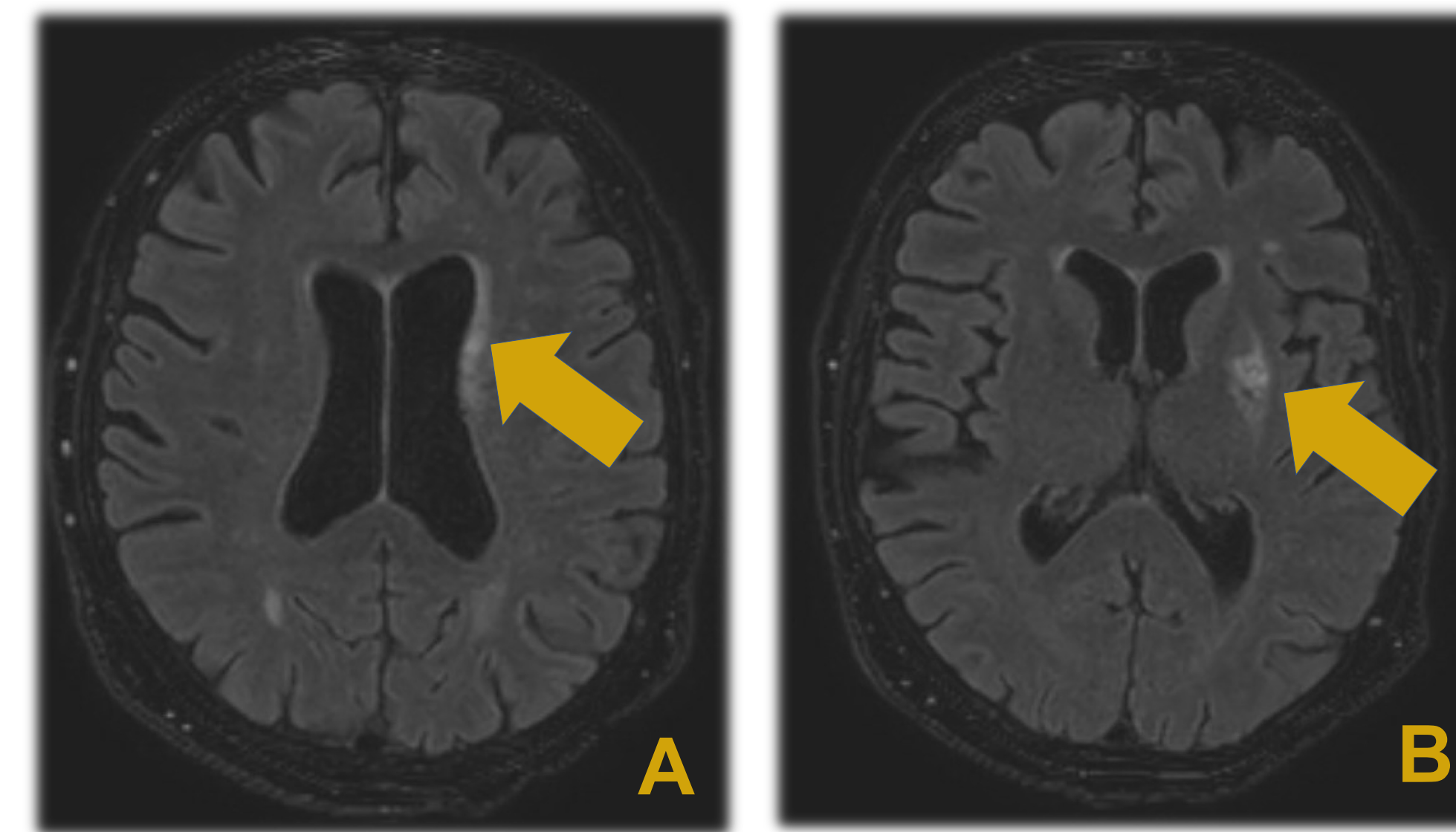
## METHODS

- Relevant literature was identified by searching CINAHL and PubMed databases.
- Keywords: “heart failure,” “cardiac failure,” “cognitive impairment,” “cognitive deficit,” “neurocognitive impairment,” “neurocognitive deficit,” and “cognition.”
- Articles not pertaining to heart failure, humans, cognition were excluded.

## RESULTS

### Brain Structural Changes ⇔ Cognitive Impairment

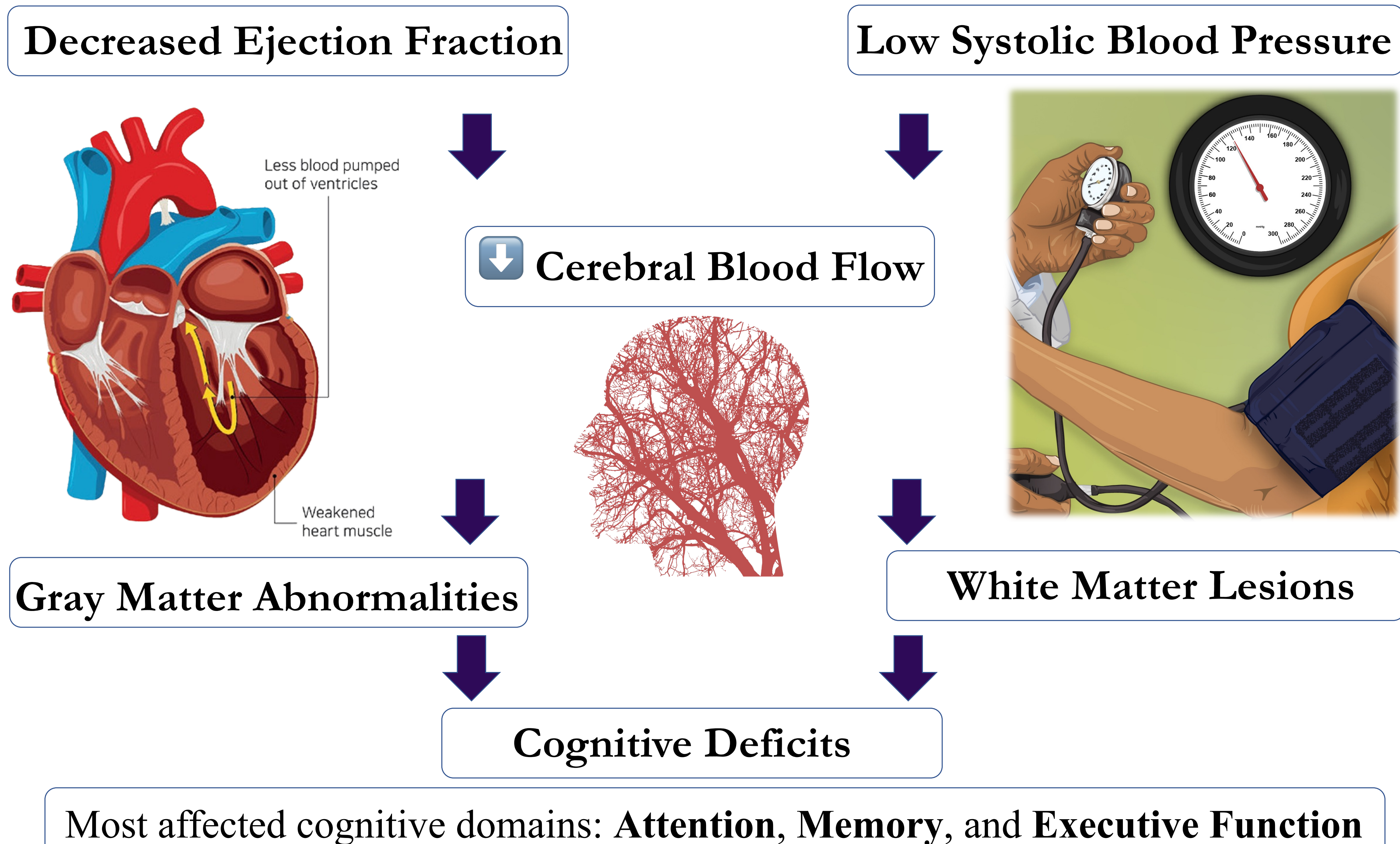
- Loss of gray matter density
- Regional gray matter loss
- White matter lesions



White Matter Lesions in HF

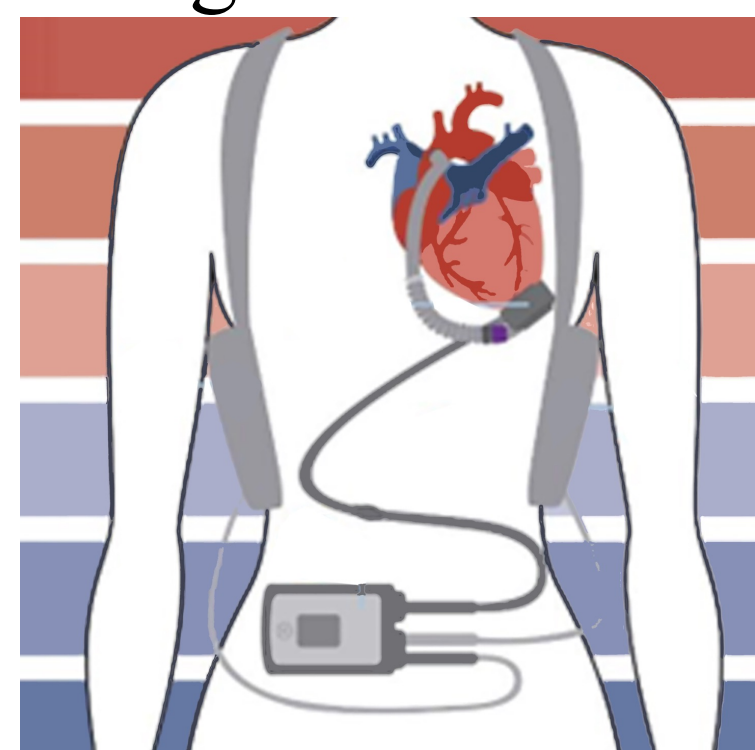
A Periventricular White Matter Hyperintensities  
B Deep White Matter Hyperintensities

### HF Hemodynamic Alternations ⇔ Brain Structural Changes



### Cognitive Changes After Left Ventricular Assist Device Implant

- LVADs are implantable mechanical pumps used to support the failing left ventricle.
- LVADs improve cardiac output, end-organ perfusion, and cerebral blood flow. However, cognitive improvements were inconsistent in study participants.
- The mechanical nature of LVADs may limit the usage of imaging to investigate underlying brain changes.



## CONCLUSION

- Hemodynamic alternations in HF lead to brain structural changes and consequential cognitive impairment.
- The management of HF requires the active participation of patients, who are expected to adhere to complex treatment regimens.
- Cognitive impairment may lead to difficulties complying with medical regimens/devices, suboptimal management, and increased health complications and healthcare usage.

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