ALZHEIMER DISEASE

Fast Facts:

- Chronic brain disorder that causes memory loss and thinking difficulties.
- Most common neurodegenerative disease responsible for dementia.
- Responsible for about 50% of dementia.
- Symptoms can include memory loss, confusion, difficulty with thinking, difficulty with simple tasks, agitations, delusions, hallucinations.
- Risk factors: advancing age, race, ethnicity, education level, heart disease, high blood pressure, high cholesterol, type 2 diabetes.
- There is no cure only management strategies and medications to help slow progression.

What is seen in the brain:

- Atrophy and gliosis of the hippocampus and medial temporal lobe; this means the cells waste away and are damaged/scarred in areas of the brain that are specific to learning, memory, and the formation and processing of memory.
- Histologically you see amyloid plaques and neurofibrillary tangles; which means on microscope in a sample of a brain with Alzheimer disease you can see clumps of protein that build up in the brain areas responsible for memory and thought, these clumps are a hallmark of dementia.
- These changes are permanent and irreversible.

VASCULAR DEMENTIA

Fast Facts:

- Chronic condition that occurs when blood vessels in the brain are damaged which leads to decreased blood flow and oxygen to the brain.
- Second most common type of dementia.
- Symptoms include memory and focus problems, confusion, personality changes, difficulty speaking, slowed thinking, restlessness and agitation, depression, unsteady walking, difficulty reasoning and planning.
- Risk factors include high blood pressure, diabetes, high cholesterol, and smoking.
- There is no cure but there are lifestyle changes and medications that can help slow disease progression.
- Often progresses in a stepwise progression or with abrupt onset.
- Can occur alone or with another dementia type.

What is seen in the brain:

- Small lacunar infarcts and microinfarcts; this is visual evidence on microscope of small strokes in the brain when a blood clot blocks a small artery causing a tiny area of tissue death in the brain.
- Perivascular space dilations; these are fluid filled spaces around small blood vessels in the brain that become enlarged due to damage.
- Myelin loss; which means damage of the protective coating around nerve cells which causes nerve cells to not be able to communicate with each other properly.
- Arteriolosclerosis; which is hardening of arteries that causes blood flow restriction. This is associated with high blood pressure, high cholesterol, and diabetes.
- With MRI subtle ischemic injury can be seen in living individuals on imaging.

LEWY BODY DISEASE

Fast Facts:

- A brain disorder that causes abnormal protein deposits in the brain causing dementia.
- This type of dementia is progressive, meaning symptoms worsen over time.
- Symptoms include visual hallucinations, memory loss, and movement problems, Parkinson like movement, depression, difficulty processing visual information, autonomic nervous system malfunctioning.
- Can be difficult to diagnose because it has similar symptoms to other brain diseases and psychiatric disorders.
- There is no cure but there are medications and lifestyle changes that can help with disease progression and management.

What is seen in the brain:

- Deposition of alpha-synuclein in Lewy bodies and neurites; these are protein clumps inside nerve cells and their extensions, these protein clumps disrupt normal brain function.
- Loss of tegmental dopamine cell populations; this means the breakdown or death of dopamine producing nerve cells in an area of the brain important for reward processing and motivation. This can lead to movement difficulties, depression, and brain function changes.
- Loss of basal forebrain cholinergic populations; this refers to breakdown or death of nerve cells in a region of the brain that make acetylcholine, a chemical important for memory and learning.