Cognitive Impairments in HD

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Outline

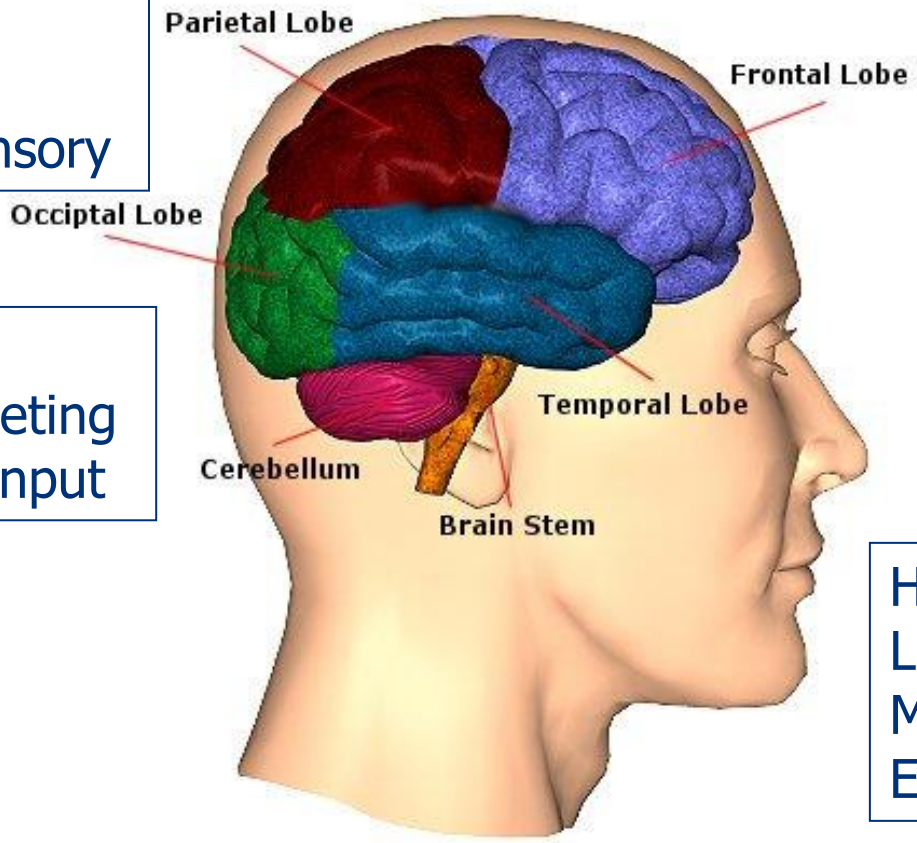
- A little brain anatomy and brain changes in HD
- Cognitive impairments that can occur in HD
- Approaches to managing these cognitive changes

Background

- Cognitive changes are among the most debilitating aspects of HD
- Very subtle changes can start early in HD
- They eventually lead to reduced job performance and contribute to loss of functional abilities (e.g. driving, cooking safely)
- The cognitive and secondary functional consequences can also create stress for families of affected individuals
- Knowledge is power: knowing what to expect can lead to better compensation

Brain Anatomy and Function

Spatial abilities,
Math,
Reading
Somatosensory



Motor Abilities
Executive functions:
- Planning
- Prioritizing
- Multi-tasking
- Monitoring behavior

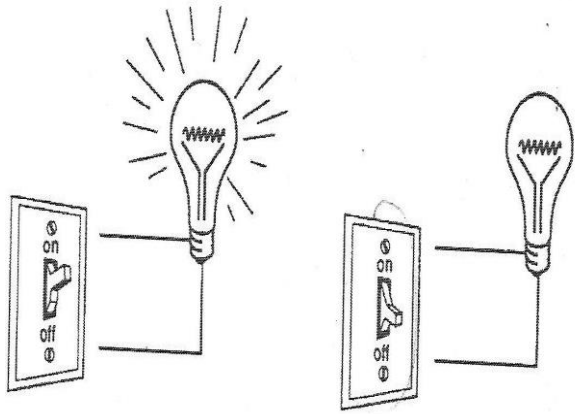
Social/emotional behavior

Vision,
Interpreting
visual input

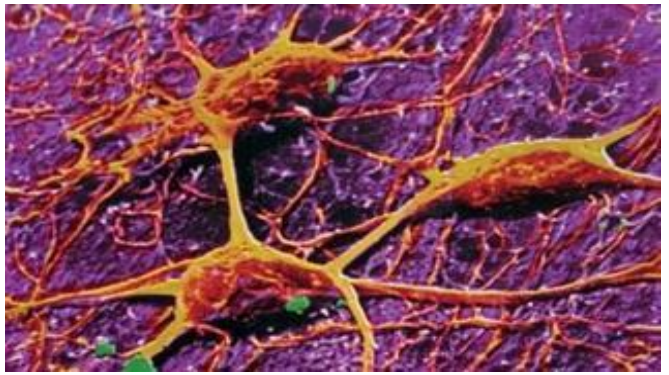
Hearing,
Language,
Memory,
Emotions

Brain circuitry

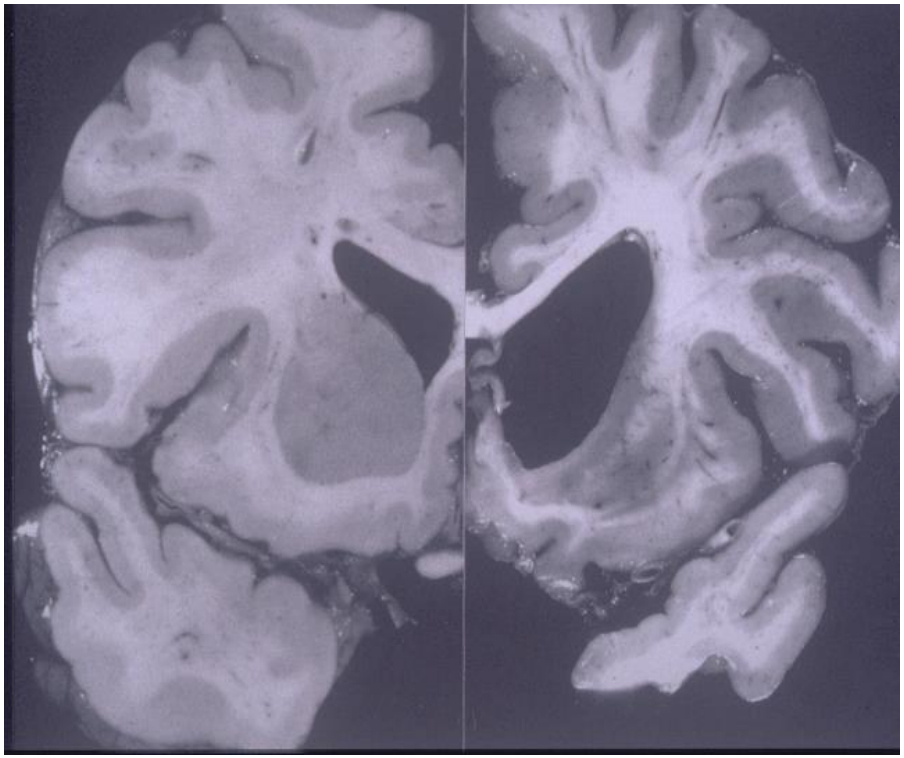
- Different brain regions need to communicate to work together
- The brain is organized as interrelated circuits or pathways that connect different parts of the brain
- Because they function together as a circuit, disruption anywhere along the path causes dysfunction of the entire circuit



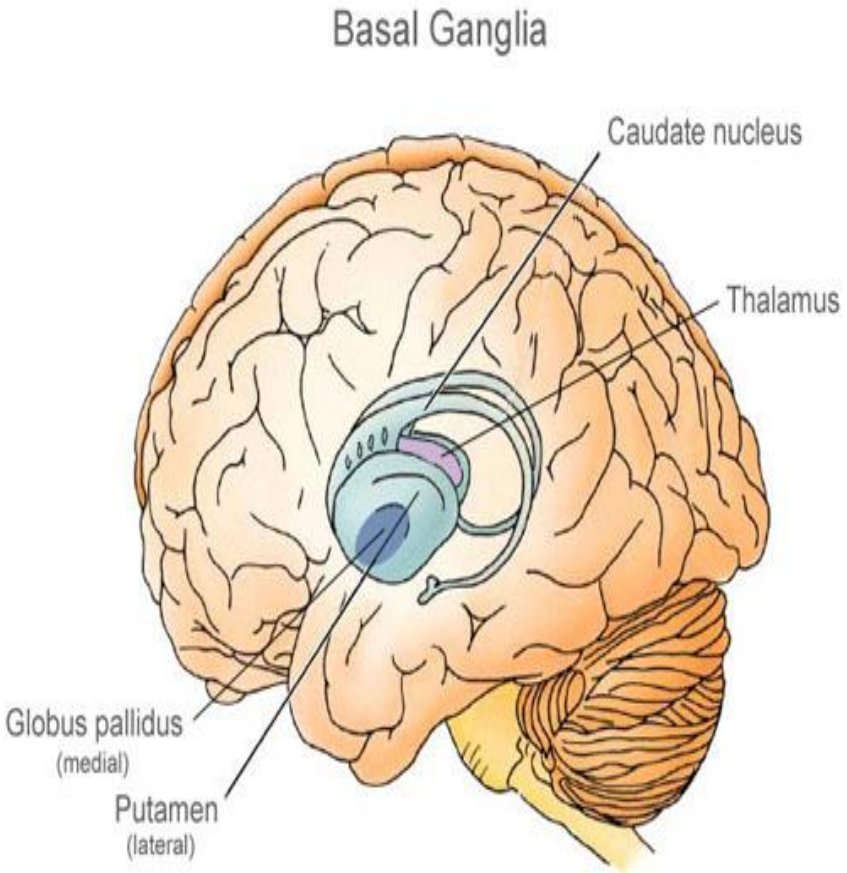
The light bulb cannot give off light if the circuit is disrupted anywhere along the path



Brain changes in HD: Cell death in the Caudate Nucleus



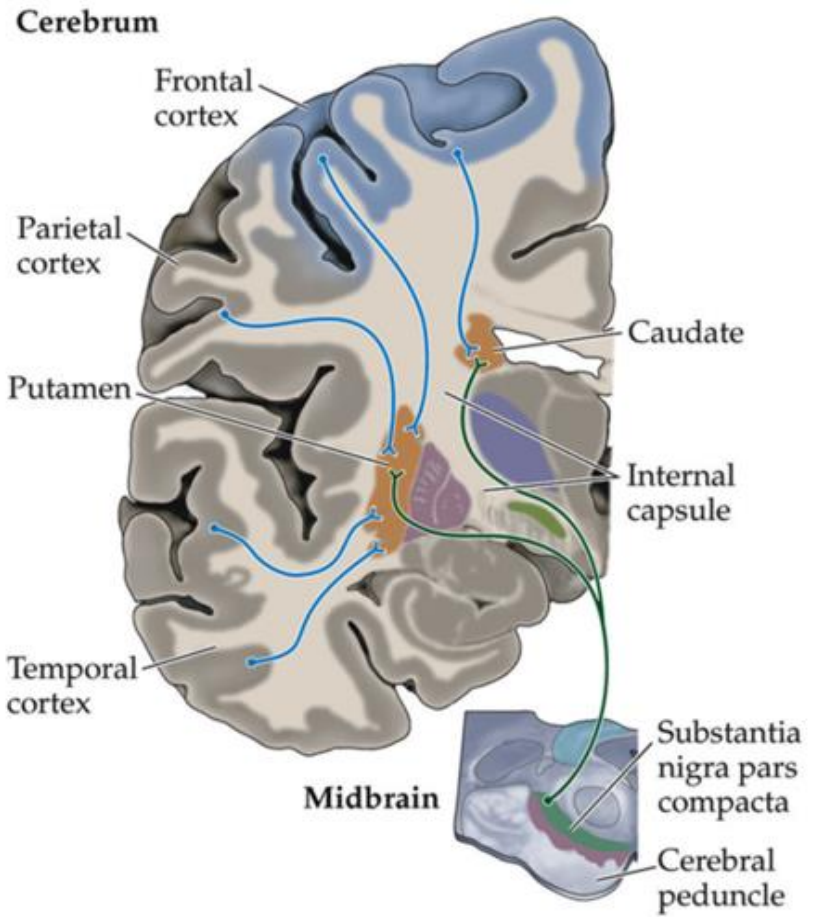
Normal Advanced HD



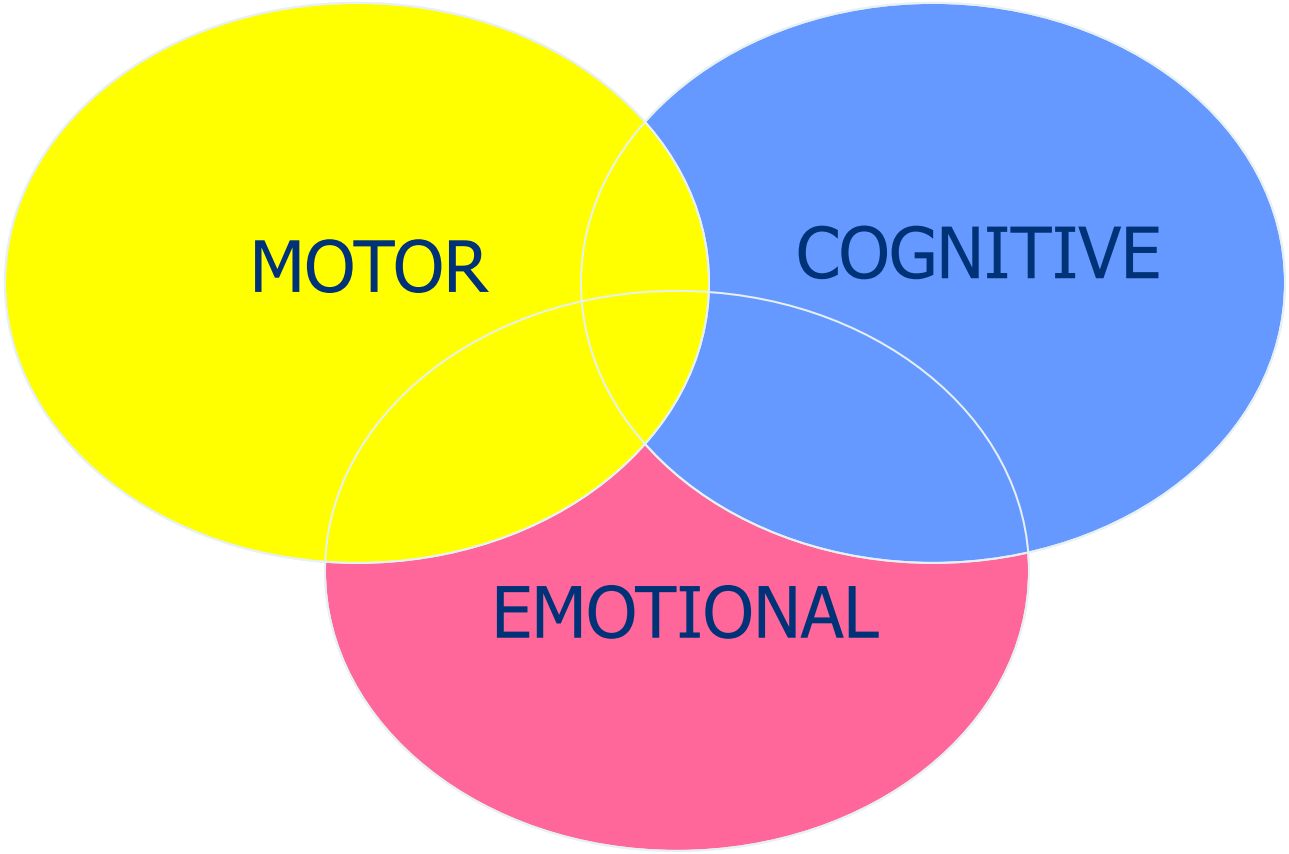
Caudate Nucleus: An important relay station

Key Functions of the Caudate:

1. Connects different regions of the brain
2. Regulates the follow of the information
3. Has the most connections with the frontal lobes



Functions of the Frontal lobe



Thinking abilities related to the Frontal lobes: Executive Functions

- The 'CEO' of the Brain
  - Planning and organization
  - Decision making
  - Reasoning and judgment
  - Problem solving
  - Anticipating consequences
  - Knowing when to initiate a behavior and when it is no longer needed
  - Divided Attention
  - Creative thinking
  - Regulation of other basic abilities such as attention, perception, language, and memory

Impairments in executive functions

- **Disorganization**
  - Problems keeping up with finances and other paperwork (loosing important documents)
  - Problems keeping track of one's schedule (e.g. missing appointments)
  - Difficulty prioritizing and sequencing tasks
  - Tasks like following a recipe, developing a meeting agenda or applying for social security become overwhelming
- **Poor judgment**
  - Not weighing the consequences
  - Making bad decisions at work, poor financial decisions
- **Problems with 'mental flexibility'**
  - Only seeking something 'one way'
  - Getting stuck on certain ideas
  - No longer able to multi-task/doing more than one thing at a time
  - Easily distracted by other things in the environment
  - Becoming overwhelmed by new or chaotic circumstances

Impaired Executive Functions (cont.)

- **Processing speed reductions**
  - It takes longer to do tasks
  - Tasks are more mentally draining then they used to be
- **Problems tracking time**
  - Difficulty estimating how long a task will take
  - Difficulty judging how much time has elapsed
- **Reduced impulse control**
  - Saying things without thinking first
  - Difficulty regulating eating, smoking, sexual behavior
  - Shop lifting
- **Problems with apathy**
  - Difficulty "getting started"
  - Difficulty following through with tasks
  - Watching TV for long periods of time
  - Not keeping up with hygiene
  - Does not = laziness

Compensatory strategies

- **Use 'external aids' to assist the CEO!**
  - Use a daily 'To Do' lists (helps to 'getting going' and what order to tackle things)
  - Break big jobs into little steps
  - Use a calendar (place in highly visible location)
  - Use alarms and reminders on smart phones
  - Keep a routine schedule
  - Recruit an Executive Assistant - all CEOs have one!
- **Minimize distractions**
  - Do only one thing at a time (limit radio and/or talking while driving, limit conversations and other distractions while cooking)
  - Work in a quiet location
  - One question at a time! (minimize stimulus overload!)

Compensatory strategies (cont.)

- Allow for extra time
- Prepare for changes in routine
- Keep trips short, go to familiar places
- When repetitive thoughts arise, use distraction, go do something, get out of the house
- Use humor – we all make mistakes!

Cognitive problems in other areas: Communication

- **Communication difficulties:**
  - Increased slowness in responding during conversation due to difficulty organizing thoughts
  - Word finding difficulty
  - Difficulty tracking conversations
  - Going 'off topic' in conversations
  - Reduced spontaneous initiation of conversation
- **Strategies:**
  - Accept that extra time in needed
  - Others may need to provide topics of conversation
  - Use multiple choice questions rather than open ended questions

Cognitive problems in other areas: Memory

- **Memory difficulties:**
  - Organizational problems and distraction can lead to problems learning new information
  - Difficulties retrieving information from 'memory stores'
  - Motor memory system impairments (later in disease) – e.g. motor memories associated with driving, playing a musical instrument, riding a bike
- **Strategies to compensate:**
  - Use hints to help with recall
  - When learning information, learn a little at a time
  - Use external aids like note books, keep information in smart phone
  - Use calendars

Additional things to consider

- Every person is individual and will have unique strengths and weaknesses (before and during the disease)
- Approaches to managing a cognitive issue at one stage in the disease may need a new ‘fix’ in the next stage
- Even when cognitive impairments result in limitations in everyday functions, identify ways to continue family roles and interests