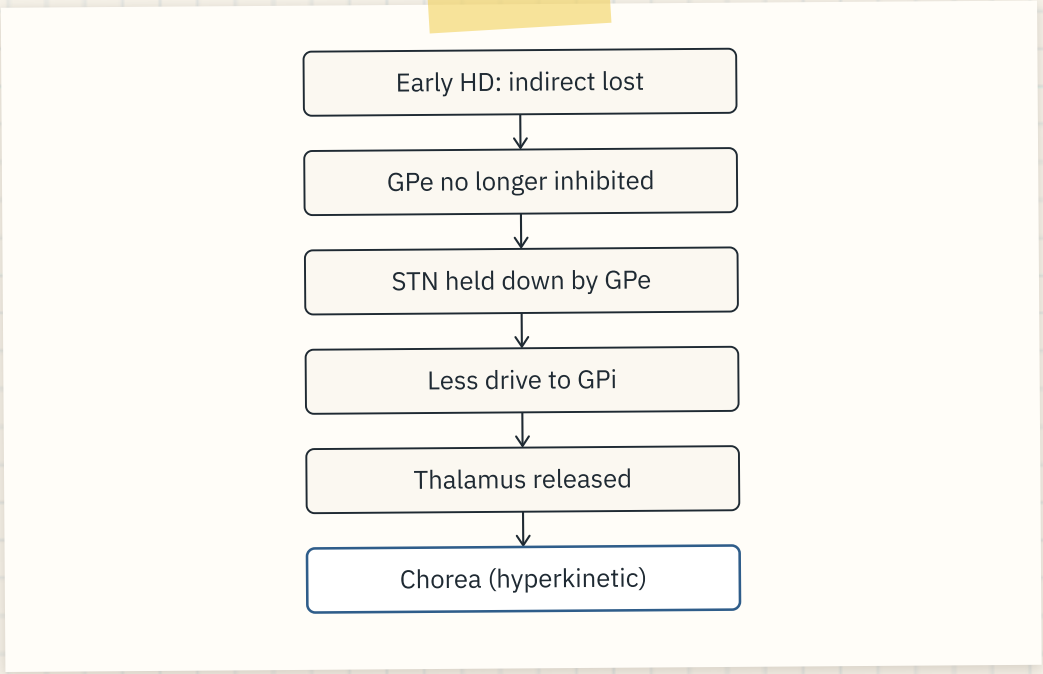
Basal ganglia pathways

Direct, indirect, dopamine, Parkinson and Huntington



Step by step

1. Output nuclei (GPi, SNr) hold the thalamus down with GABA
2. Cortex excites the striatum (caudate, putamen)
3. Direct (D1) lifts the brake: go
4. Indirect (D2) strengthens it via the subthalamic nucleus: stop
5. Dopamine favours go through both

	Direct	Indirect
Receptor	D1	D2
Striatum inhibits	GPi	GPe
Brake on thalamus	Lifted	Strengthened
Result	Go	Stop
Dopamine (SNc)	Excites	Inhibits

Two pathways, one brake

Three things to keep

Direct is go through D1, indirect is stop through D2; dopamine means go

Parkinson: nigral dopamine loss, too much brake

Huntington: striatal loss, indirect first, too little brake

Exam traps

- Too much brake is hypokinetic (Parkinson); too little is hyperkinetic (Huntington).
- Dopamine excites the direct (D1) pathway and, via D2 receptors, inhibits the indirect pathway: both favour movement.
- The subthalamic nucleus is glutamatergic and strengthens the brake.
- Direct go and indirect stop is the classical exam model, a proposed model in the sources.

Basal ganglia direct and indirect pathways: D1, D2 and movement

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/neuroanatomy-localisation/basal-ganglia-direct-and-indirect-pathways

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