The mechanism of action and pharmacodynamic effects of propofol

**Propofol activates GABA<sub>A</sub> channels**

Propofol opens these chloride channels and causes chloride to enter the cell. This brings the cell closer to the "reversal potential" for chloride, which is below the depolarization threshold. Thus, the membrane comes to be hyperpolarized.

**Effects of propofol**

Duh, it’s a general anaesthetic.

Propofol also has numerous non-sedation-related effects:

- **Antiemetic** – perhaps due to a dopamine (D2) receptor antagonism.
- **Antihistamine, antipruritic**
- **Anticonvulsant**... some choreiform movements have been observed, with opisthotonos. That’s all probably due to a subcortical glycine antagonism. Propofol does antagonize tonic-clonic seizures.
- **Cerebral blood flow is decreased**: this could be good or bad.
- **Dose dependent respiratory depression** – more than thiopentone
  - Decreased tidal volume and increased respiratory rate
  - Impaired or even completely abolished response to hypoxia and hypercapnea
- **Bronchodilation**
- **Depressed laryngeal reflex**

**SYMPATHOLYTIC EFFECTS:**

- Impaired or completely abolished the arterial baroreflex response to hypotension;
- This means, a shocked patient who is compensating for their shock will stop compensating, and crash hideously on induction.
- **Dose-dependent decreased heart rate and decreased cardiac output**
- **Dose-dependent vasodilation and hypotension** – more than thiopentone

- **Decreased hepatic blood flow**
- **Green urine, as well as potentially green hair**: due to the phenols

From "Goodman & Gilman’s The Pharmacological Basis of Therapeutics" II<sup>e</sup> ed by Brunton et al, and "Basic & Clinical Pharmacology" II<sup>e</sup> ed. By Katzung et al, as well as a chapter devoted to propofol in the excellent "Clinical Anaesthesiology" by Morgan McAniel and Murray. There is a good article about propofol clearance. Furthermore, the ever-so-helpful AstraZeneca people have a PI document in PDF for you to read. Propofol infusion syndrome is well covered by Kam (Yes, THAT Kam)