Propofol Worksheet

This comprehensive workbook guides you through the essential knowledge and clinical application of propofol in anesthesia practice. Complete each section to build mastery of this critical intravenous anesthetic agent.

Learning Objectives: Self-Assessment Checklist

Before class, check what you already know. During class, mark progress.

Objective	Before Class (✓/)	After Class (✓/)	Notes
Understand onset, duration, recovery profile			
Explain mechanism (GABA-A modulation)			
Interpret PK features & context-sensitive half time			
Select induction/maintenance/sedation doses			
Identify/manage adverse effects & PRIS			

Warm-Up Prompt

In 2–3 sentences, describe what makes propofol unique among IV anesthetics.

(Write here)

Quick Diagram Activity — "Find the Key Features"

Circle or highlight the correct items in each set:

Propofol is a:

- Alkylphenol
- Barbiturate
- Benzodiazepine
- Sedative-hypnotic
- Water-soluble
- Lipid emulsion

Which formulation components are present?

- Soybean oil
- Egg lecithin
- Glycerol
- Lidocaine
- Preservatives (EDTA or metabisulfite)

Structure & Safe Handling

"SAFE HANDLING" Note Box

Write the two most important infection-prevention rules from the lesson:

1.
2.

Mechanism Snapshot

Complete this short structured summary:

> Propofol works mainly by enhancing _____ receptor activity, leading to increased _____ influx and neuronal _____. This results in hypnosis, EEG slowing, and anticonvulsant effects without intrinsic _____.

Mechanism of Action

Mechanism Concept Map

Fill in the missing elements.

1. **Propofol**
2. **GABA-A receptor**
3. **↑ chloride channel open time**
4. _____
5. _____
6. **hypnosis**

Minor Mechanisms: Quick Match

Match each receptor with its effect.

Receptor / Channel	Effect	Letter
NMDA inhibition	A. Enhances inhibitory signaling	
Nicotinic ACh inhibition	B. Contributes to sedation	
Glycine receptor modulation	C. Reduces excitatory transmission	

Correct matches: NMDA → __ Nicotinic → __ Glycine → __

Pharmacokinetics

PK Table — Student Completion

Fill in using lecture content:

PK Feature	Your Notes
Onset (arm-brain time)	
Distribution phase	
Why bolus effect is short	
Major metabolic pathways	
Extrahepatic metabolism sites	
Clearance characteristics	
Elimination half-life	

"Explain It Simply" Activity—Context-Sensitive Half Time

Rewrite the concept in one paragraph as if explaining it to a new SRNA:

(Write here)

Mini Case Scenarios

Frail Elderly/Cardiac Patient — Induction Titration

Your patient is an 86-year-old, 52-kg woman with severe aortic stenosis, chronic kidney disease, and an EF of 25%. She is anxious, mildly hypotensive (SBP 94), and has poor functional reserve. The surgeon requests a rapid but safe induction for urgent hip fracture repair. You know that even small drops in afterload could be catastrophic and that she is extremely sensitive to propofol.

Question for the student: How would you titrate the propofol induction for this patient? Describe the dose, speed, monitoring, and any vasoactive support you would have ready before starting.

Neurosurgical Case — TIVA for Craniotomy

A 54-year-old man with a frontal mass is scheduled for a craniotomy requiring tight ICP control and a smooth, rapid neurological wake-up. The neurosurgeon prefers propofol-remifentanil TIVA, emphasizing the need to avoid brain swelling and maintain reliable BIS values. The case is expected to last 5–6 hours.

Question for the student: What is your TIVA plan? Include your starting propofol and opioid infusion ranges, how you would adjust them during the case, and how you would maintain stable hemodynamics and ventilation to preserve CPP.

MAC Sedation — AICD Insertion in the EP Lab

A 70-year-old man with ischemic cardiomyopathy (EF 20%) presents for an AICD insertion under MAC. The EP team needs the patient able to tolerate arrhythmia induction and deep lead manipulation without losing the airway. He is extremely sensitive to hypotension and apnea. The environment is remote, with limited help in the room.

Question for the student: How would you manage propofol sedation for this MAC case? Describe your sedation goal, titration strategy, monitoring approach, backup airway plan, and how you would avoid hypotension/apnea.

Pharmacodynamics: CNS, Cardio, Resp

CNS Effects Summary Box (Fill + Notes)

Complete:

Propofol decreases: $CMRO_2$, CBF, ICP

Propofol preserves: _____ and _____

Clinical uses from CNS profile:

1.
2.

Cardiovascular Reasoning Grid

Fill in each mechanism/effect pair:

Mechanism	Physiologic Effect
Arterial vasodilation	_____
Venous vasodilation	_____
Direct myocardial depression	_____
Blunted baroreflex	_____

Which patient groups are most sensitive? List 3.

1.
2.
3.

Respiratory Effects Mini-Diagram

Fill in arrows:

> Propofol → ↓ ventilation drive → (↓ / ↑) tidal volume + (↓ / ↑) respiratory rate → likely outcome: _____

Apnea risk increases with:

- Fast push
- High dose
- Co-administration with _____

PD Comparisons & Other Effects

"Compare & Contrast" Activity

Circle which agents are preferred in asthmatics:

Propofol **Etomidate** **Ketamine**

Explain the reason (1–2 sentences):

(Write here)

Other System Effects — Quick Identification

Check all TRUE:

- Lowers intraocular pressure
- Causes significant bronchodilation
- Can cause injection pain
- Raises ICP
- May cross placenta and sedate neonate
- Leads to myoclonus more often than etomidate

Dosing & Administration

Weight-Based Dosing Box

Fill in the common induction dose ranges:

Population	Induction Dose (mg/kg)	Notes
Healthy adult	_____	
Elderly / cardiac compromised	_____	
Pediatrics	_____	

Infusion Rates Practice

Fill in appropriate ranges:

- **TIVA maintenance:** ___ – ___ mcg/kg/min
- **MAC sedation:** ___ – ___ mcg/kg/min

Dosing Reasoning Scenario

You have a 78-year-old frail patient for hip fracture repair. Write how you would titrate induction and why. Include the words slow, incremental, and hemodynamic monitoring.

(Write here)

Procedural Sedation Exercise

Circle options that reduce apnea risk during MAC sedation:

- Slow incremental titration
- Using a large 1 mg/kg bolus
- Adding opioid up front
- Capnography use
- Verbal contact during titration

Injection Pain Strategy Planner

List two strategies to reduce injection pain:

1.
2.

Pediatric Note Box

Why do children usually require higher mg/kg induction doses? (Short answer)

Adverse Effects, Toxicity, PRIS

Quick Categorization Activity

Sort the effects into the correct category:

Effects: Hypotension, bradycardia, apnea, respiratory depression, hypertriglyceridemia, myoclonus, green urine, PRIS, allergic rash.

Common	Less Common	Serious

PRIS Diagnostic Pattern Fill-In

Complete the list using lecture notes:

- _____ acidosis
- Rhabdomyolysis / ↑ CK
- Hyper_____
- Cardiac failure / bradyarrhythmias
- _____ crystalized urine
- Renal failure
- Hepatomegaly
- Lipidemia

High-risk scenario: > ____ mcg/kg/min for > ____ hours + catecholamines/steroids

PRIS Clinical Interpretation Case

A ventilated patient on high-dose propofol shows: rising lactate, new bradycardia, CK 12,000.

Next steps (list 3):

1.
2.
3.

Allergy Clarification Box

True/False:

- Propofol should be avoided in all egg-allergic patients.
- Soy allergy is a contraindication.
- Egg anaphylaxis warrants increased caution.

Write one sentence summarizing the real clinical guidance:

(Write here)

Drug Interaction Sorting

Identify whether each increases sedation depth (✓) or increases hypotension risk (✓):

Drug	Deepens Sedation	Increases Hypotension
Opioids		
Benzodiazepines		
Beta blockers		
Volatile anesthetics		

Clinical Pearls & Reflection

Hemodynamics Checklist

Before giving propofol, ensure:

- Fluid status optimized
- Vasopressors immediately available
- IV access and airway supplies ready
- Patient risk factors reviewed

Add two more items of your own:

1.
2.

Airway Readiness Activity

List three reasons apnea is common after induction with propofol:

1.
2.
3.

Clinical Pearls — Your Notes

Fill in the takeaway for each flashcard:

Flashcard	Your Notes
Slow Titration in Fragile Patients	
Antiemetic Mini-Dosing	
Early Recognition of PRIS	

Micro-Case: Combine Concepts

A young healthy patient is undergoing TIVA for ENT surgery. Midway through the case, BIS drifts too low and BP is falling.

What adjustments would you make to propofol rate, opioid dosing, and hemodynamic support? (Short paragraph)

Final Summary Box

Write five bullet-point key takeaways from the lecture in your own words.

1.
2.
3.
4.
5.

Exit Ticket

In one sentence, describe the most clinically important thing you learned about propofol today.

(Write here)