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Remifentanyl in Office Anesthesia: Where It Helps, Where It Hurts, and How to Use It Safely

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Today's Agenda

What Is Remifentanyl?

Drug class, mechanism, and pharmacological profile

Why Consider It?

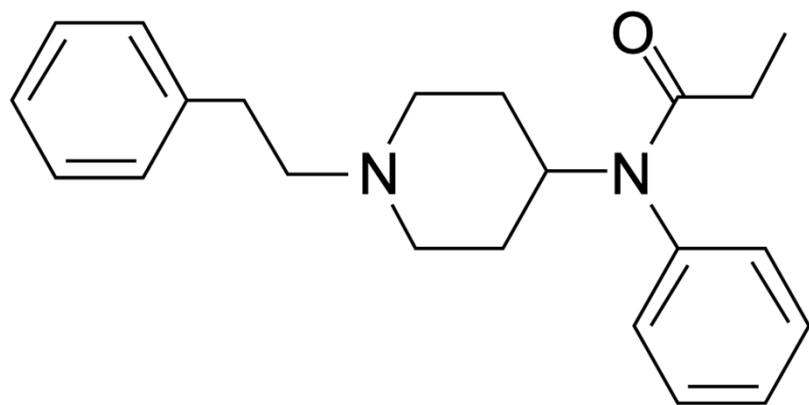
Clinical advantages and evidence in oral surgery

Risks & Monitoring

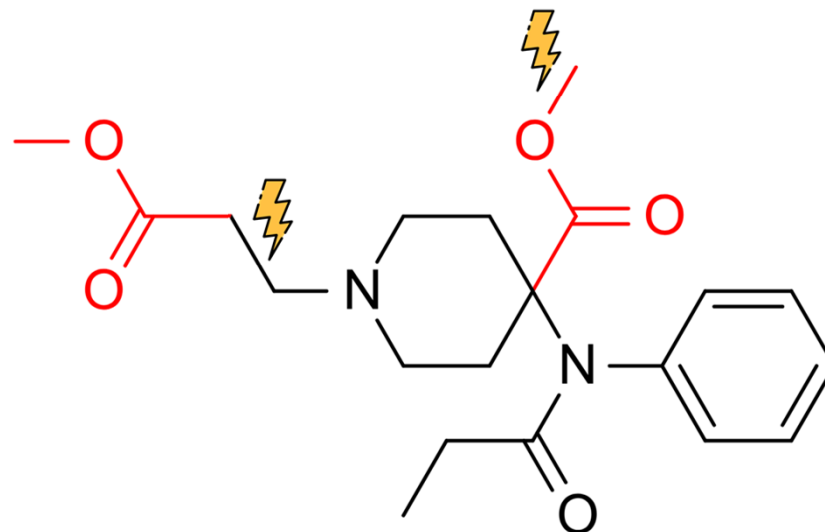
Safety profile, respiratory depression, and monitoring

Adoption Strategy

Patient selection, dosing, and a first-use protocol



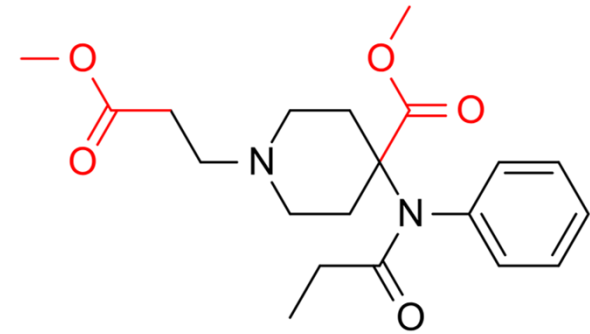
Fentanyl



Remifentanyl

Drug Overview

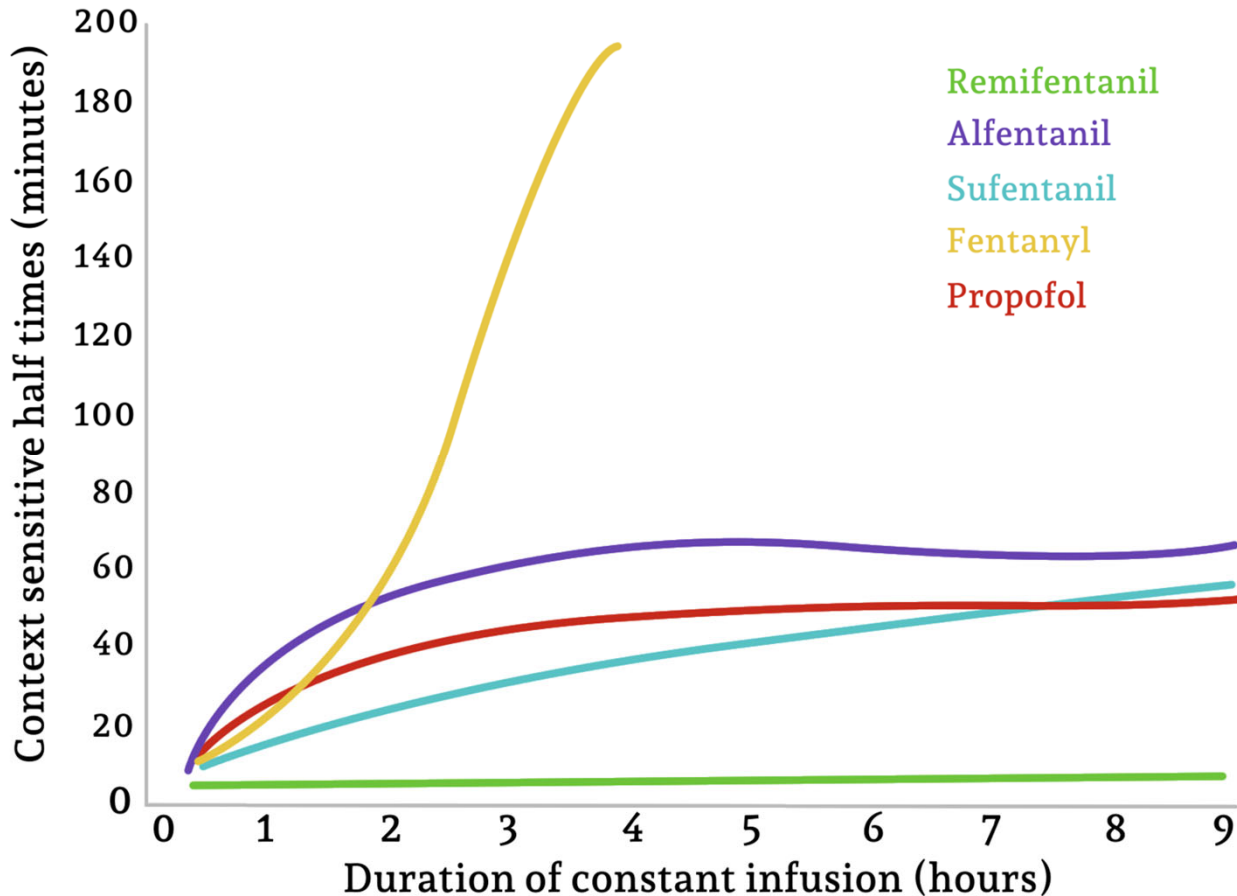
Drug Class:	Ultra-short-acting μ -opioid agonist
Route:	Continuous intravenous infusion only
Onset and Peak effects:	~1 minute to peak effect
Half-Life:	~3–10 minutes (context-insensitive)
Metabolism:	Non-specific plasma & tissue esterases
Elimination:	Independent of hepatic or renal function
Potency:	Similar to fentanyl (requires infusion delivery)



Key Points:

- Fast onset, Fast off
- Fast onset gives the false sense that potency is greater than Fentanyl
- Bolus dosing is not indicated
- Safe for patients with renal/hepatic impairment
- Recovery time is consistent across all patients
 - Including patients with butyrylcholinesterase-deficiency and pseudocholinesterase deficiency

Context-Insensitive Half-Life



5-10 min

Remifentanyl offset time — regardless of infusion duration

Clinical Implication

Fast, predictable emergence even for long procedures. Ideal for long, painful, stimulating, and complex office-based procedures for reliable and safe discharge planning.

Clinical Advantages in the Office Setting

Precise, Real-Time Titration

Effect changes within 2-3 minutes of adjusting the infusion rate. The surgeon has direct control over depth of sedation at all times, without waiting for drug accumulation to clear.

Faster Patient Recovery

Studies in oral surgery show significantly faster extubation and discharge readiness versus fentanyl-based regimens. A meaningful advantage in high-volume office practices.

Consistent Discharge Timing

Context-insensitive pharmacokinetics mean the last patient of the day recovers as quickly as the first. No carryover sedation, no delayed discharges from drug accumulation.

Reduced PONV

Shorter systemic opioid exposure reduces post-operative nausea and vomiting compared to longer-acting agents, improving patient comfort and reducing post-op phone calls.

Where the Infusion Model Thrives

*The titratable infusion model is uniquely suited to stimulating procedures where **local anesthesia is insufficient**, and for **longer** or more **technique-sensitive** procedures where avoiding re-titrating sedatives mid-procedure would be beneficial.*

Sx in Difficult to Anesthetize Sites

*Local block is anatomically unreliable or physiologically compromised.
Systemic analgesia fills the gap.*

- High-riding or sinus-displaced maxillary third molars
- Biopsies of lesions in the maxillary sinus or intra-osseous lesions in the maxilla.
- Lingual full-bony impacted teeth of the mandible
- **Incision & drainage** of fascial space abscesses, impaired function of local anesthetics due to acidic environment.

Long & Technique-Sensitive Procedures

Sustained infusion provides a stable analgesic plane with depth adjustable in real time as stimulation varies.

- **Coronectomies:** Delicate, meticulous technique demanding a consistently still, comfortable patient
- **Full-arch implant cases:** Prolonged surgery with variable stimulation throughout
- **TMJ arthrocentesis:** Challenging anatomy, delicate instrumentation, extended case duration

Special Populations & Key Clinical Applications

UNIQUE INDICATION: Suspected or Confirmed OSA

When procedural sedation is unavoidable in a patient with suspected or diagnosed OSA, remifentanyl is the preferred opioid over longer-acting alternatives.

Its rapid offset means any respiratory event resolves within minutes of stopping the infusion. Unlike fentanyl, which can depress respiration for hours.

Requirement: heightened monitoring, capnography, airway rescue immediately available.

APPLICATION: Propofol + Remifentanyl Infusion

Co-infusion of remifentanyl with propofol is a well-established TIVA (Total Intravenous Anesthesia) technique. Remifentanyl provides intraoperative analgesia and reduces propofol requirements by 30–50%.

This balance of hypnosis (propofol) with potent opioid analgesia (remifentanyl) is particularly effective for painful oral surgical procedures to reduce frequency of sedative re-titration.

Caution: both agents depress respiration synergistically. Reduce BOTH proportionally when combining.

Where it hurts

Understanding the risks, costs and safety profile and what your office must have in place

The Cardiovascular Risks

Dose-Dependent Respiratory Depression

Risk increases directly with infusion rate. Above **0.1 µg/kg/min**, respiratory depression becomes substantially more likely.

Remifentanyl and propofol in combination, have a synergistic effect on respiratory depression. Thus infusion rates should be proportionally reduced.

Patients with Reduced Cardiac Reserve

Exercise great caution with use of Remifentanyl in patients with CHF, significant CAD, hypovolemia, or any condition diminishing cardiac reserve.

Remifentanyl has been shown to have greater cardiac depression than equivalent doses of Fentanyl, Sufentanyl.

DOSE ADJUSTMENT — Elderly Patients (≥65 yrs)

Reduce the initial dose by at least 50% in elderly patients.

Start at 0.025 µg/kg/min and titrate with greater caution. Decreased lean body mass, reduced clearance, and heightened CNS sensitivity significantly amplify drug effect at standard doses. Emergence may still be rapid but cardiovascular and hemodynamic volatility are more pronounced.

Opioid Induced Hyperalgesia

What is it?

A little known and paradoxical increase in pain sensitivity caused by opioids, not just at the surgical site but broadly. Patients may experience **hyperalgesia**, increased pain from already painful stimuli, or **allodynia**, pain from stimuli that is not otherwise painful.

Mechanism

Central sensitization to nociceptive pathways. Multiple mechanisms have been proposed. Increased release and reduced reuptake of excitatory neurotransmitters (**glutamate** and **aspartate**), causing increased activation of **NMDA** (N-methyl-D-aspartate) receptors in spinal dorsal horns.

Evidence

Multiple meta-analyses have been conducted on OIH:

- Higher doses of Remifentanyl showed a statistically significant but clinically small increase in pain.
- Found to occur in even healthy patients without pre-operative pain or medical conditions causing pain such as fibromyalgia.
- Conflicting studies and evidence for the role of Ketamine in reducing OIH

Risk Reduction Strategies

- 1 **Conservative Remifentanyl Dosing:**
Less than or equal to 2 micrograms/kg/min
- 2 **Profound and Long Lasting Local Anesthesia**
- 3 **Ketamine: 0.1-0.2mg/kg/min**
Direct NMDA Antagonist
- 4 **Dexmedetomidine:**
Indirect NMDA Antagonist
- 5 **Slow Taper Off Remifentanyl:**
Reduce rate over 5-10 min

How to use it safely

Patient selection, dosing guidance, and a conservative first protocol

Preparing Your Office for Safe Use

1

Airway Equipment

BVM, laryngoscope, ETT (multiple sizes), LMA, and suction all immediately at chairside.

2

Emergency Medications

Naloxone, succinylcholine (rigidity), epinephrine, atropine, flumazenil if benzos co-administered.

3

Calibrated Infusion Pump

Remifentanyl must be delivered via an IV pump. Gravity drip or bolus administration is inappropriate and dangerous.

4

Dedicated Monitor

A dedicated team member must observe the patient continuously. The operating surgeon cannot be the sole monitor.

5

Recovery Protocol

Establish clear discharge criteria (e.g., modified Aldrete score). Despite fast offset, patients must meet criteria before release.

6

Credentials & Permits

Verify state permits allow office-based opioid infusions. Ensure ACLS/PALS certification is current for all team members.

Starting Recommendations

1

Begin with ideal patients.

ASA I–II, BMI < 35, and normal airways at conservative doses. A phased adoption strategy is the safest path to clinical confidence.

2

Prepare your office supplies.

Your office must be prepared before use: capnography, BVM, supplemental oxygen, calibrated infusion pump, airway rescue equipment, emergency medications, and a dedicated monitor at all times.

3

Do not rush your first case with Remifentanyl.

Allocate extra time for your first case with Remifentanyl. As fast and effective as this agent may be, it is only as effective and safe as its operator is knowledgeable, experienced and patient.

Starting Protocol

Induction

- 1 Begin remifentanyl at **0.05 µg/kg/min**
- 2 Titrate upward by **0.025 µg/kg/min** every 3–5 min
- 3 Separate Propofol Infusion, with weight based dosing.
- 4 Supplement with bolus of:
 - *Ketamine*
 - *Precedex*
 - Midazolam

Maintenance

- 1 Range: **0.05–0.1 µg/kg/min**. Never > **2 µg/kg/min**
- 2 Keep rate $\leq 0.1 \mu\text{g/kg/min}$ to minimize respiratory risk
- 3 Monitor EtCO₂ and SpO₂ continuously throughout

Emergence

- 1 Reduce remifentanyl infusion rate for 2–5 min before procedure end
- 2 Supplement with non-opioid analgesics. (e.g. Ketorolac, Tylenol)
- 3 Monitor for signs of pain (e.g. grimacing, tachycardia)
- 4 Confirm full orientation and stable vitals before release

⚠ Suggested starting framework only. Always conduct your own primary literature research prior to implementing any changes to your clinical practice.

Key Takeaways

1

Leverage Remifentanyl's unique pharmacology for:

Long procedures, surgical fields difficult to anesthetize, technique sensitive procedures.

2

Unique Patient Populations:

Suspected or diagnosed obstructive sleep apnea, renal or hepatic dysfunction.

3

Respiratory depression is the primary risk:

Mandatory capnography and conservative dosing and slow titration are non-negotiable first steps.

References

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Thank You,

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