

# Pharmaceutical Profiling of Fentanyl Use in Portugal: Consumption Patterns and Abuse Deterrence Gaps

**Ana Isabel Fernandes** 

aifernandes@egasmoniz.edu.pt

Egas Moniz Center for Interdisciplinary Research (CiiEM), Egas Moniz School of Health & Science, Caparica, Almada, Portugal

### Introduction

Fentanyl, a synthetic opioid 50–100× more potent than morphine, is widely prescribed for severe pain, especially in oncology settings and perioperative care, but is also highly susceptible to misuse, dependence, and fatal overdose, particularly in fast-acting formulations [1].

□ While Portugal has largely restricted use to medical settings, recent trends show increasing outpatient consumption, raising concerns about diversion, non-medical use [2], and the absence of abuse-deterrent formulations (ADFs).

## Methodology



**Data Source** 

Analgesic opioids sales in community pharmacies 2015-2022 (ANF, Infarmed)



#### Variables Extracted Year, dosage form, potency, brand/generic



#### Misuse Potential Assessment

### Aims

- Characterize the pharmaceutical landscape of fentanyl in Portugal, with particular attention to dosage form distribution, consumption trends, and formulation-related abuse potential.
- By identifying current gaps in abuse deterrence, this research seeks to inform future strategies for safer opioid prescribing, surveillance, and pharmaceutical innovation in the Portuguese context.



Route of administration, onset of action, and tamperability



**Statistical Methods** Descriptive statistics for trend analysis





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**Figure 1.** Annual number of opioid analgesic packages dispensed in community pharmacies. The inset highlights fentanyl-specific trend.

**Table 1.** Pharmaceutical typification of fentanyl dosage forms currentlyavailable in Portugal regarding abuse potential.

Sublingual tablet

Oral transmucosal lozenge

Transdermal patch
Nasal spray

Figure 2. Distribution of fentanyl dosage forms (% total doses)



The **least-used dosage forms** are **brand-name only**, which may limit access. Barriers include higher costs, niche indications, and prescriber unfamiliarity.

- **Formulation characteristics** (route, onset, tamperability) critically impact abuse risk.
  - X No fentanyl ADFs are currently available in Portugal.
  - Matrix transdermal patches lower misuse risk
    Still misused via extraction or reuse

Dosage form	Route	Onset	Duration	ADF	Abuse potential
Patch	Transdermal	Slow	Long	No <sup>1</sup>	Low to Moderate <sup>1</sup>
Sublingual tablet	Sublingual	Fast	Short	No	High
Buccal film	Oromucosal	Fast	Short	No	High
Lozenge with applicator	Oromucosal	Fast	Short	No	High
Nasal spray	Intranasal	Fast	Short	No	High
Injectable solutions	Intravenous	Immediate	Short	No	Moderate <sup>2</sup> to High <sup>3</sup>

<sup>1</sup>Partial deterrence – difficult to extract the drug from matrix patches; potential for misuse via extraction or reuse. <sup>2</sup> Parenteral forms under restricted access; <sup>3</sup> Injectable forms – immediate bioavailability, increased risk of overdose.

One Health Risks

🌯 Pet poisoning via discarded patches

Strategies needed

📊 Link prescription & usage data 🛛 🥻 Educate on safe use, storage & disposal

**T** Environmental residues

Require safer formulation & packaging from industry

Promote **cross-sector collaboration** (health + veterinary + environment)

### Conclusions

- The predominance of transdermal and sublingual forms, both of which carry moderate-to-high abuse potential, highlights the need for continued pharmacovigilance and prescriber education.
- The overall rise in fentanyl use highlights its increasing role in pain therapy but also amplifies the urgency for implementing ADFs, particularly in formulations with rapid onset.
- A comprehensive **opioid stewardship model with One Health alignment** should be implemented.

- 1. Gudin, J.A.; Nalamachu, S.; Leong, M.; Schatman, M. Abuse potential of fentanyl and its analogs. Journal of Pain Research 2020, 13, 1223–1230.
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