

# Assessment of Tapentadol API Abuse Liability with the Researched Abuse, Diversion and Addiction-Related Surveillance (RADARS) System Poison Center Program

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## Purpose

- Tapentadol is a Schedule II opioid with a combination of  $\mu$ -opioid activity and norepinephrine reuptake inhibition.
- Used for management of moderate to severe acute and chronic pain.
- Dual mechanism of action thought to reduce opioid-related side effects.
- Since approval, across multiple outcomes a pattern of low, although not absent, abuse liability has been found.
- Objective: To compare the rate of intentional abuse of tapentadol active pharmaceutical ingredient (API) to other opioids in the RADARS Poison Center program.

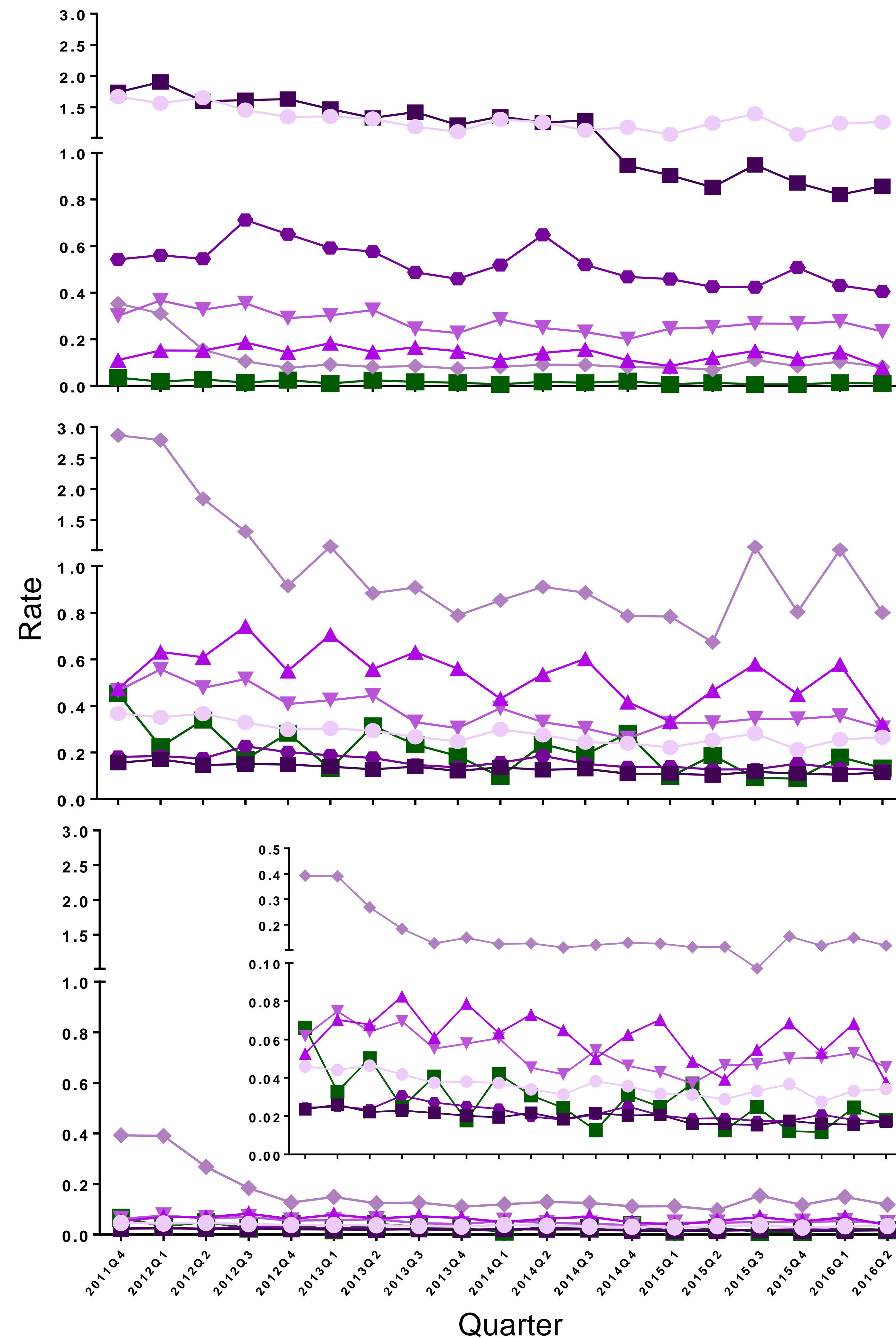
## Methods

- Retrospective cohort study.
- Intentional abuse case mentions reported to the Poison Center program from fourth quarter 2011 through second quarter 2016 were analyzed and compared between 7 APIs:
  - Tapentadol, oxycodone, hydrocodone, oxymorphone, hydromorphone, morphine, tramadol
- Rates were calculated per quarter using 3 denominators:
  - Population, total number of prescriptions dispensed, total number of dosage units dispensed
- Confidence intervals were calculated using exact Poisson method.
- Rate ratios comparing cumulative rates of abuse for each opioid to tapentadol were calculated using saturated Poisson regression.

## Legend



## Poison Center Intentional Abuse



Quarterly rates of tapentadol and comparator opioid abuse per 1,000,000 population (A), per 10,000 prescriptions dispensed (B), per 100,000 dosing units dispensed (C) from 4<sup>th</sup> quarter 2011 to 2<sup>nd</sup> quarter 2016.

## Results

- From 4<sup>th</sup> quarter 2011 through 2<sup>nd</sup> quarter 2016, there were 87 tapentadol product intentional abuse exposure case mentions reported to participating poison centers.
- When adjusted per population, rates of tapentadol intentional abuse were the lowest among all products (0.007-0.036/1,000,000 population).
- Average quarterly rate was 0.015 (95% CI 0.012-0.019) per 1,000,000 population.
- Rate ratio between tapentadol and comparators showed other APIs were intentionally abused at rates 7.414 (oxymorphone) to 84.322 (oxycodone) times the rate of tapentadol per population.
- When adjusted for drug availability, tapentadol had neither the largest nor the smallest rate of intentional abuse.
- Average quarterly rate of intentional abuse per 100,000 dosing units dispensed was 0.028 (95% CI 0.023-0.035), while rates were greatest for oxymorphone (0.166, 95% CI 0.153-0.179) and lowest for hydrocodone (0.020, 95% CI 0.019-0.020).

## Conclusions

- Rate of intentional abuse of tapentadol is the lowest of all APIs when adjusted per population.
- When adjusted for drug availability, tapentadol rates were neither highest nor lowest.
- In some instances, utilization rates may be largely driven by the volume of drug dispensed (i.e., small vs. large denominator) rather than actual abuse cases (i.e., the numerator), particularly important when comparing products with low vs. high utilization volumes (e.g., tapentadol vs. hydrocodone or oxycodone).
- Critical to assess utilization rates in the context of population rates and raw abuse endorsements to obtain clear understanding of overall abuse of a product.
- RADARS Poison Center program data suggest tapentadol intentional abuse presents a low but present public health burden.