

Opioid withdrawal and autonomic complications associated with medetomidine adulteration

INTRODUCTION

- Medetomidine is an emerging α_2 -AR agonist adulterant in the illicit fentanyl supply
- Composed of racemic dexmedetomidine and levomedetomidine (inactive)
- (α_2/α_1 of 1620)
 - clonidine ($\alpha_2/\alpha_1 = 220$)
 - xylazine ($\alpha_2/\alpha_1 = 160$)
- Marketed as Domitor® for veterinary sedation
- Associated with bradycardia in animals

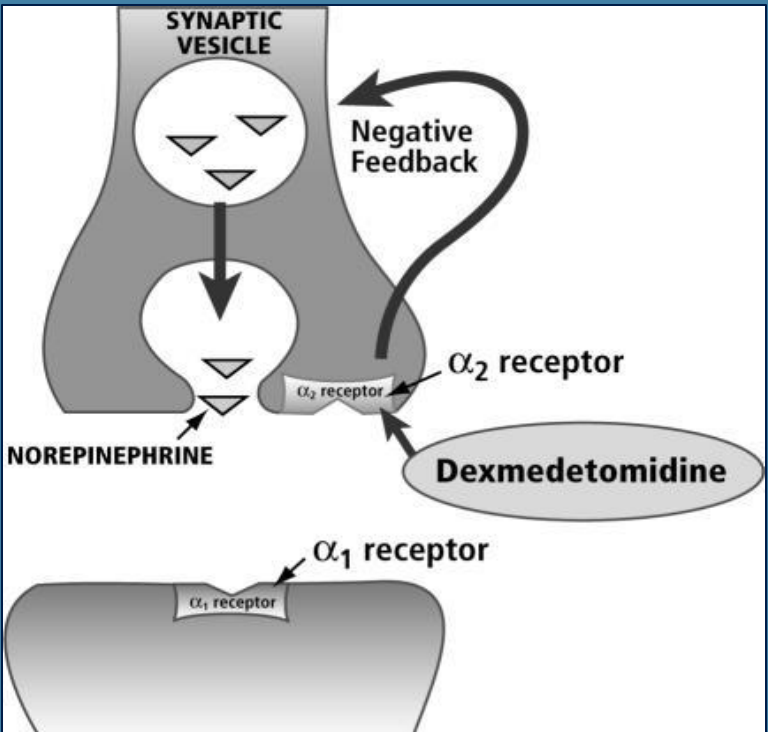
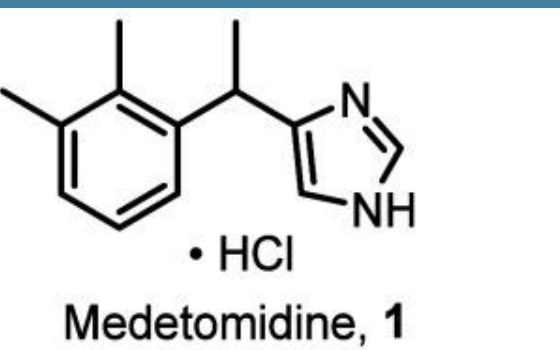
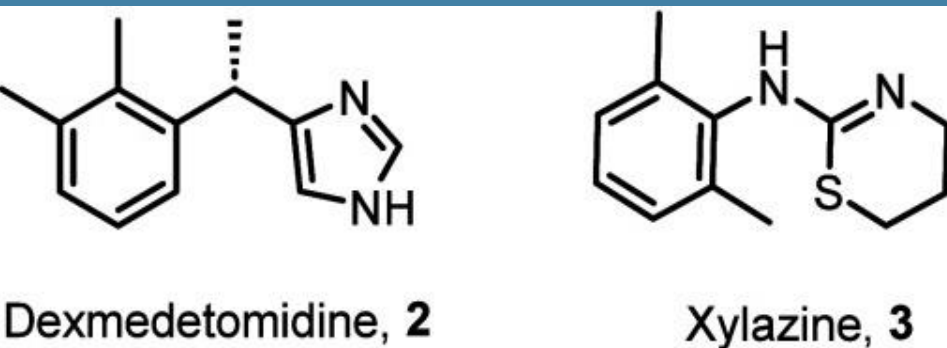
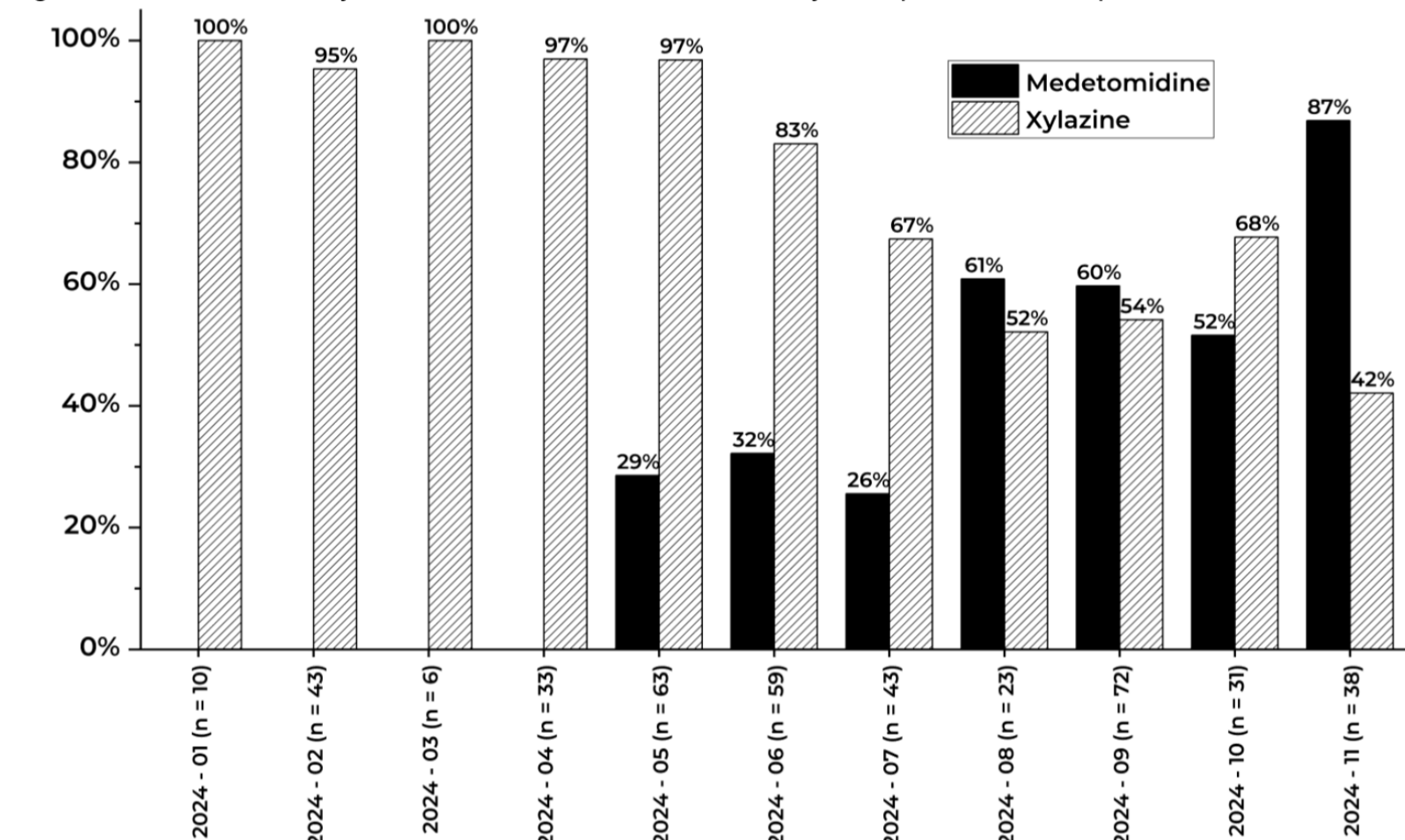


Figure 1: Prevalence of Xylazine and Medetomidine in Fentanyl Samples in Philadelphia, PA



Data source: Center for Forensic Science, Research and Education, PA Groundhogs, Philadelphia Department of Public Health

RESULTS

Characteristic	Jefferson	Penn	Temple	Total
Number of Patients	55	48	62	165
Maximum pulse (beats/min)	144 (125-155)	136 (118-156)	148 (140-157)	145 (132-156)
median & IQR				
Maximum SBP (systolic blood pressure (mmHG))	191 (172-211)	196 (171-224)	200 (185-215)	195 (175-215)
Maximum diastolic BP (median & IQR)	111 (103-123)	127 (109-137)	131 (119-143)	122 (109-136)
Treated with Dexmedetomidine	51 (93%)	35 (73%)	51 (82%)	137 (83%)
Intubated	12 (22%)	11 (23%)	16 (26%)	39 (23%)
Admitted to ICU	49 (89%)	44 (92%)	57 (92%)	150 (90%)
Disposition				
Home	15 (27%)	28 (58%)	32 (52%)	75 (45%)
Patient-Directed Discharge	14 (26%)	13 (27%)	25 (40%)	52 (32%)
Residential Drug Treatment	14 (26%)	7 (15%)	0 (0%)	21 (13%)
Law Enforcement Custody	12 (22%)	0 (0%)	5 (8%)	17 (10%)

METHODS

- Collaboration with Thomas Jefferson, University of Pennsylvania and Temple hospitals in Philadelphia
- Patients identified by addiction medicine experts based on **atypical** and **severe** opioid withdrawal requiring hospitalization
- Retrospective chart review abstracted data elements to consensus derived data tool
- Data on demographics, vital signs, substance use, and hospital course

CONCLUSIONS

- New phenomenon of severe opioid withdrawal requiring hospitalization in a cohort of 165 patients in 3 academic centers in Philadelphia
- In addition to opioid withdrawal findings, patients experienced refractory hypertension, tachycardia, vomiting, agitation, and tremor despite multi-modal therapies. All patients were treated with significant doses of full opioid agonists (methadone, oxycodone, hydromorphone, fentanyl).
- The onset parallels the emergence of medetomidine in the fentanyl supply and is similar to dexmedetomidine withdrawal in ICU patients
- Concomitant benzodiazepine or alcohol withdrawal was deemed unlikely by history and UDS
- Dosing strategies for dexmedetomidine and anti-hypertensive therapies will need to be optimized.
- Current medetomidine guidelines:
<https://penncamp.org/medetomidine/>

REFERENCES

- Bouajram RH, Bhatt K, Croci et al: Incidence of Dexmedetomidine Withdrawal in Adult Critically Ill Patients: A Pilot Study. Crit Care Explor. 2019 9:1.
- Pathan S, et al: Evaluation of dexmedetomidine withdrawal in critically ill adults. Journal of Critical Care 2021; 62:19-24.
- SUPHR: In Philadelphia, medetomidine, a potent non-opioid veterinary sedative, has been detected in the illicit drug supply.5/13/2024. PDPH Health Alert: <https://hip.phila.gov/document/4421/PDPH-HAN-0441A-05-13-24.pdf> accessed 1/18/2025

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Resources

- Overall Design Recommendations:
 - <https://biorender.com/blog/top-5-tips-for-designing-a-scientific-poster>
 - <https://guides.nyu.edu/posters>
 - <http://www.personal.psu.edu/drs18/postershow/>
- Specific Design Tools:
 - Icons: <https://thenounproject.com>
 - Free Stock Photos: <https://unsplash.com/>
 - Color Palette Picker (if you don't want to use ASAM's): <https://colors.co/>
 - QR Code Generator: <https://www.qr-code-generator.com/>
- Printing (ASAM has not independently verified the quality of these printers)
 - <https://www.posterpresentations.com/>
 - <https://scientificposterprinting.com/>
 - <https://www.uptime.com/large-format-posters-printing.html>
 - <https://www.makesigns.com/products/scientific-posters>
 - <https://www.megaprint.com/research-posters.php>