

New Toxicology Assays to Assess Medetomidine's Impact

NPS Discovery Quarterly Webinars – Q2 2024

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DISCLOSURES

- I have no conflicts of interest to disclose.
- I am a scientist and employee of FRFF / CFSRE, a 501(c)(3) non-profit research and educational facility.
- This project was supported by the National Institute of Justice, Office of Justice Programs, U.S. Department of Justice.
 - Award Number 15PNIJ-22-GG-04434-MUMU.
 - The opinions, findings, conclusions and/or recommendations expressed in this publication are those of the author(s) and do not necessarily reflect those of the Department of Justice.



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PREVALENCE



CFSRE TOXICOLOGY IDENTIFICATIONS

- **Non-administered** medetomidine identifications

- East USA

- Philadelphia (n=13), Pittsburgh (n=1), Boston (n=2), Baltimore (n=1)

- Midwest USA

- Chicago (n=8), Detroit (n=1), St. Louis (n=2)

- West USA

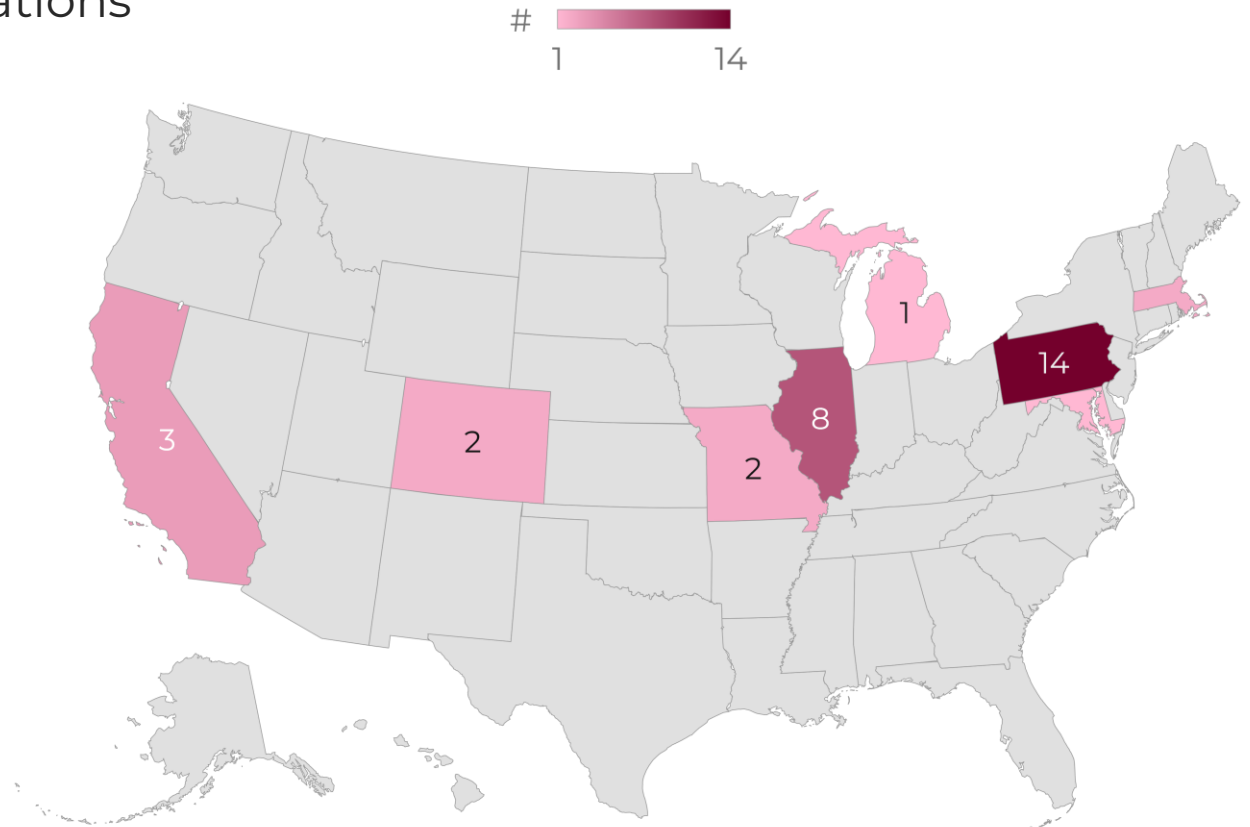
- Denver (n=2), Culver City (n=1), Los Angeles (n=1)

- Case Types

- Antemortem (n=25), Postmortem (n=9)

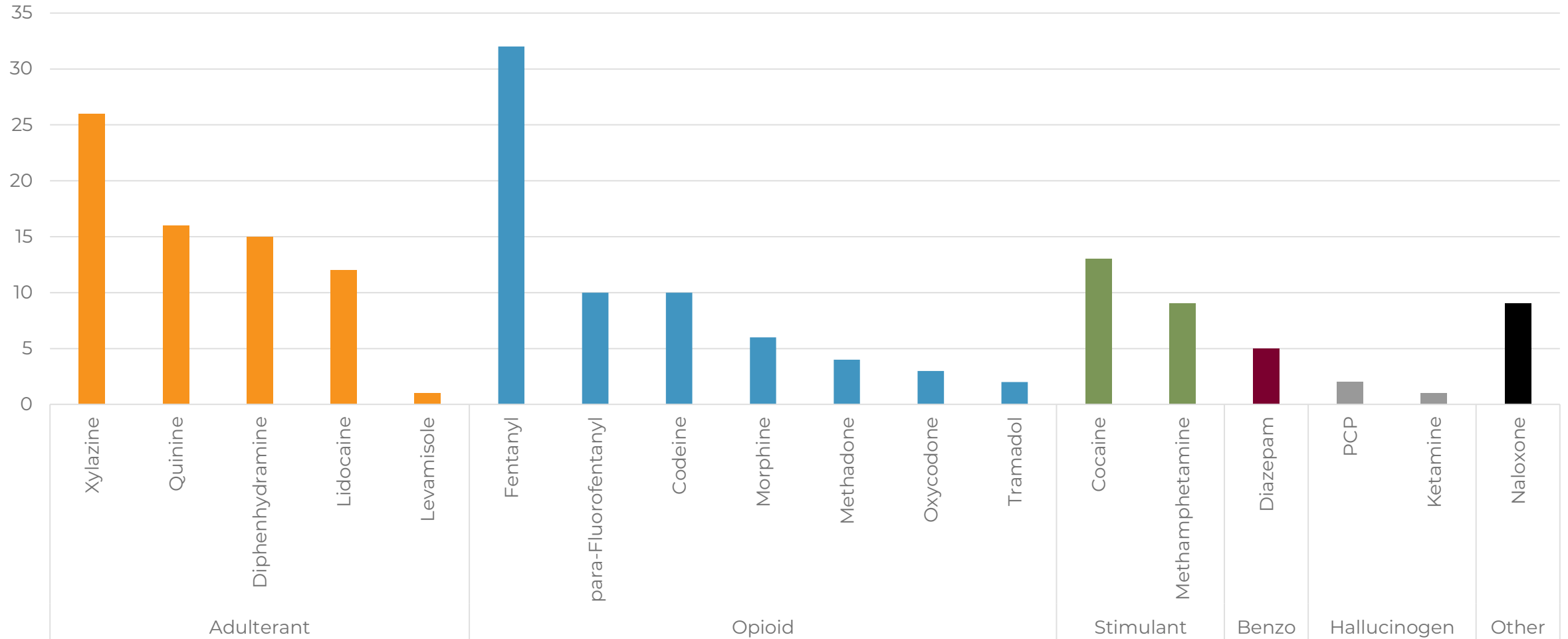
- Additional toxicology requests/indications

- Michigan, Georgia, Tennessee, Canada



DRUG COMBINATIONS

Identified w/out xylazine in
CA (n=3) and CO (n=2)



DRUG COMBINATIONS – NPS



PHILADELPHIA TOXICOLOGY SPECIMENS

Overall – lower %
medetomidine than
xylazine

Case #	Fentanyl (p)	Xylazine (p)	Medetomidine (p)
1	1	1.1	2.0
2	1	4.2	1.2
3	1	0.8	1.8
4	1	3.9	0.4
5	1	2.5	0.4
6	1	0.7	0.6
7	1	1.9	0.6
8	1	4.6	0.1
9	1	0.3	0.3
10	1	1.2	0.8
11	1	4.2	0.2

Note: Comparison using QTOF PAR normalized to fentanyl

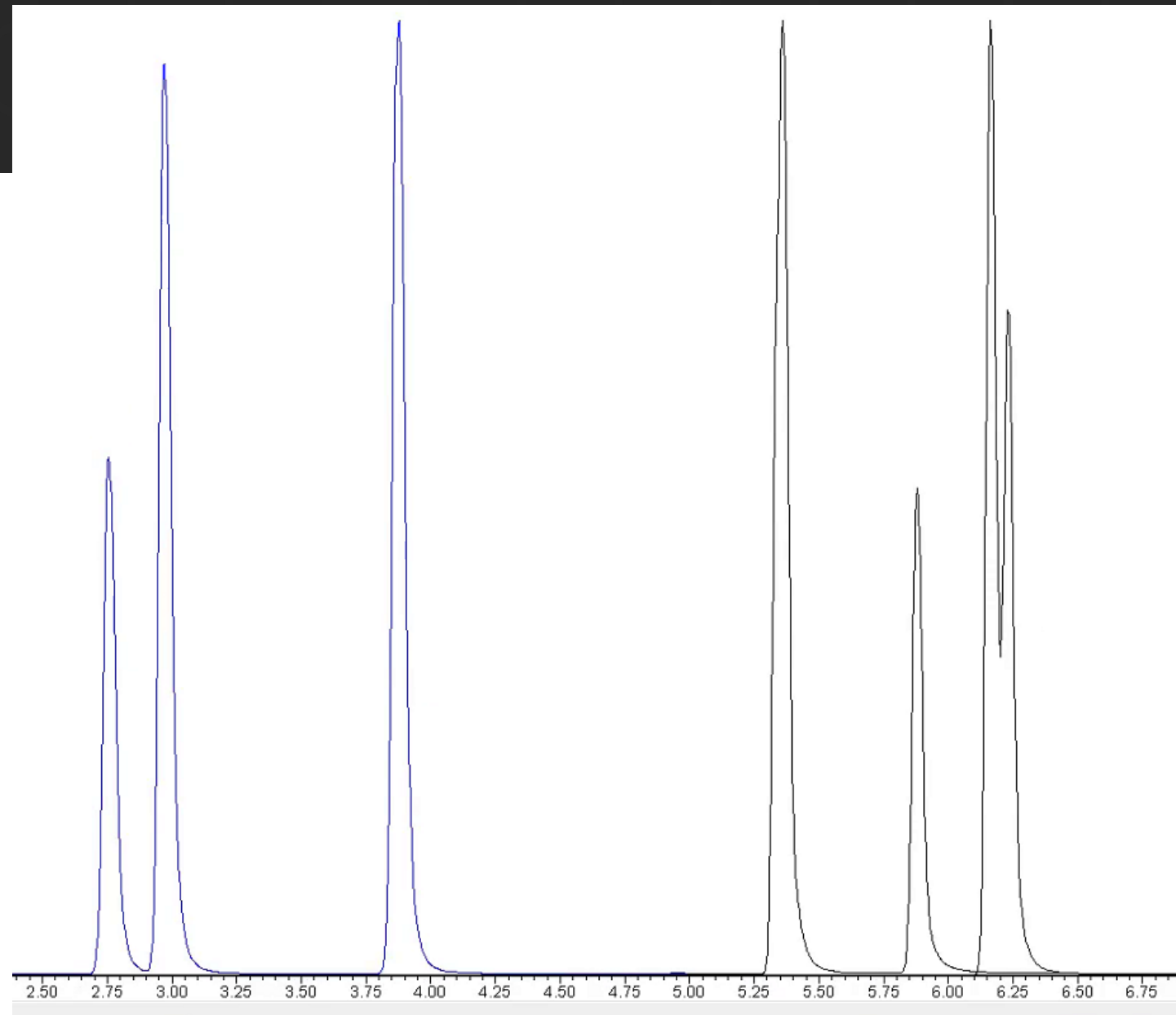


QUANTITATION & DIFFERENTIATION



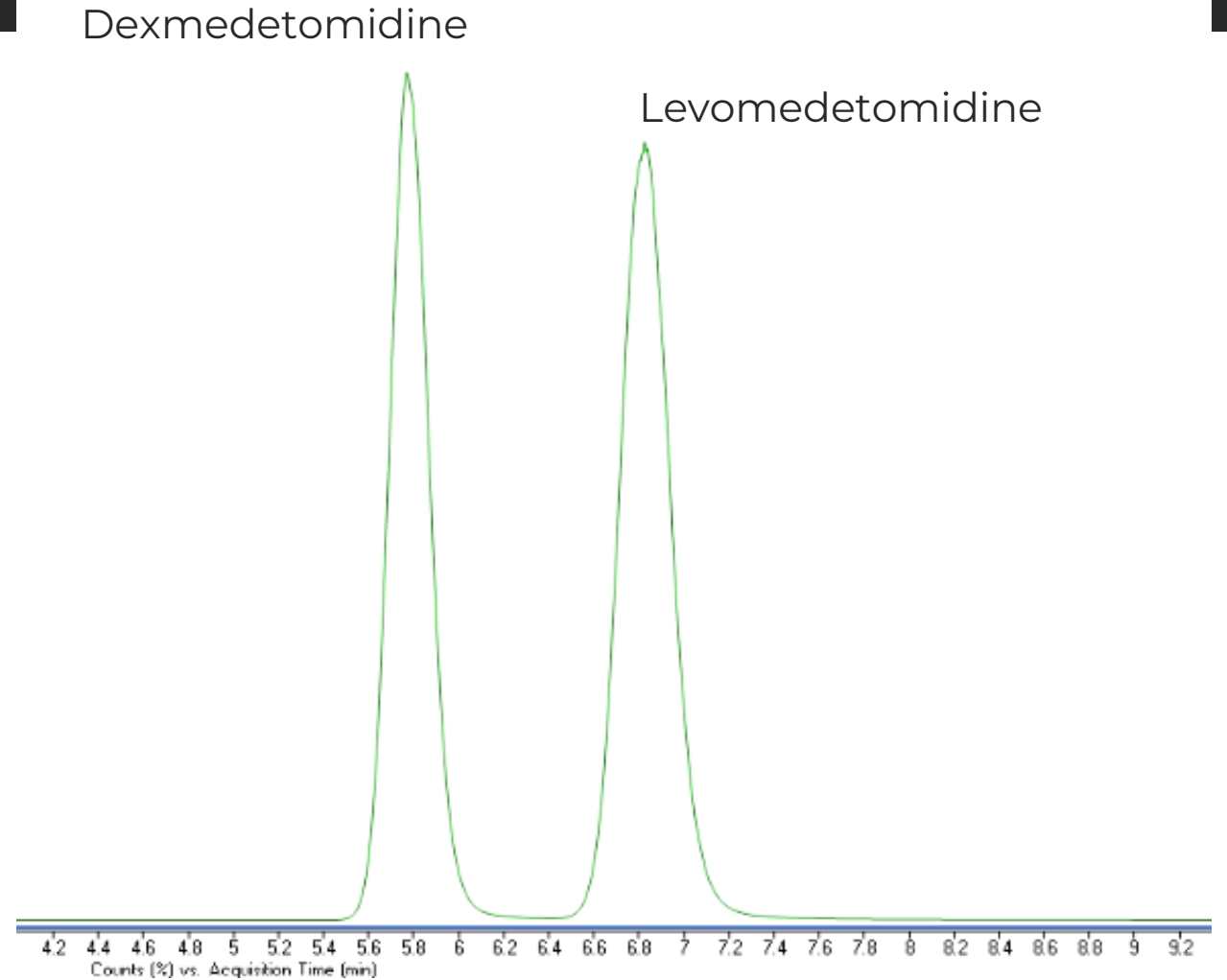
TOX. WORKFLOWS

- **Undifferentiated** Quantitative Panel
 - Fentanyl, Xylazine & Medetomidine
 - 0.1-100 ng/mL
- Validated according to ASB 036
 - *Cases pending quantitation*
- Scope
 - Fentanyl, norfentanyl
 - Xylazine, 3-hydroxy xylazine, 4-hydroxy xylazine, 2,6-xylidine, 1-(2,6-xylyl)-2-thiourea
 - Medetomidine, 3-hydroxy medetomidine



TOX. WORKFLOWS

- Differentiated Quantitative Panel
 - Dexmedetomidine
 - Levomedetomidine
- Pending full validation
- Initial results show presence of *d*- & *l*-medetomidine
 - Presence of levomedetomidine confirms this is not from emergency medicine



INITIAL DIFFERENTIATED RESULTS

TOXICOLOGY – CHICAGO

Case #	Dexmed.	Levomed.
1	+	+
2	+	+
3	+	+
4	+	+
5	+	+
6	+	+
7	+	+
8	+	+

DRUG MATERIALS – PHILADELPHIA

Case #	Dexmed.	Levomed.
1	+	+
2	+	+
3	+	+
4	+	+
5	+	+
6	+	+
7	+	+
8	+	+
9	+	+
10	+	+
11	+	+
12	+	+
13	+	+



CONCLUSIONS & FUTURE WORK



CONCLUSIONS

- Medetomidine is emerging as a [potent adulterant](#) in the drug supply
 - Differentiation of medetomidine is crucial to determine emergency medicine vs veterinary medicine
- Presence of [levomedetomidine](#) confirms drug is not from human pharmaceutical origin
- Potency of medetomidine >> xylazine
 - In toxicology cases, often found alongside fentanyl and xylazine

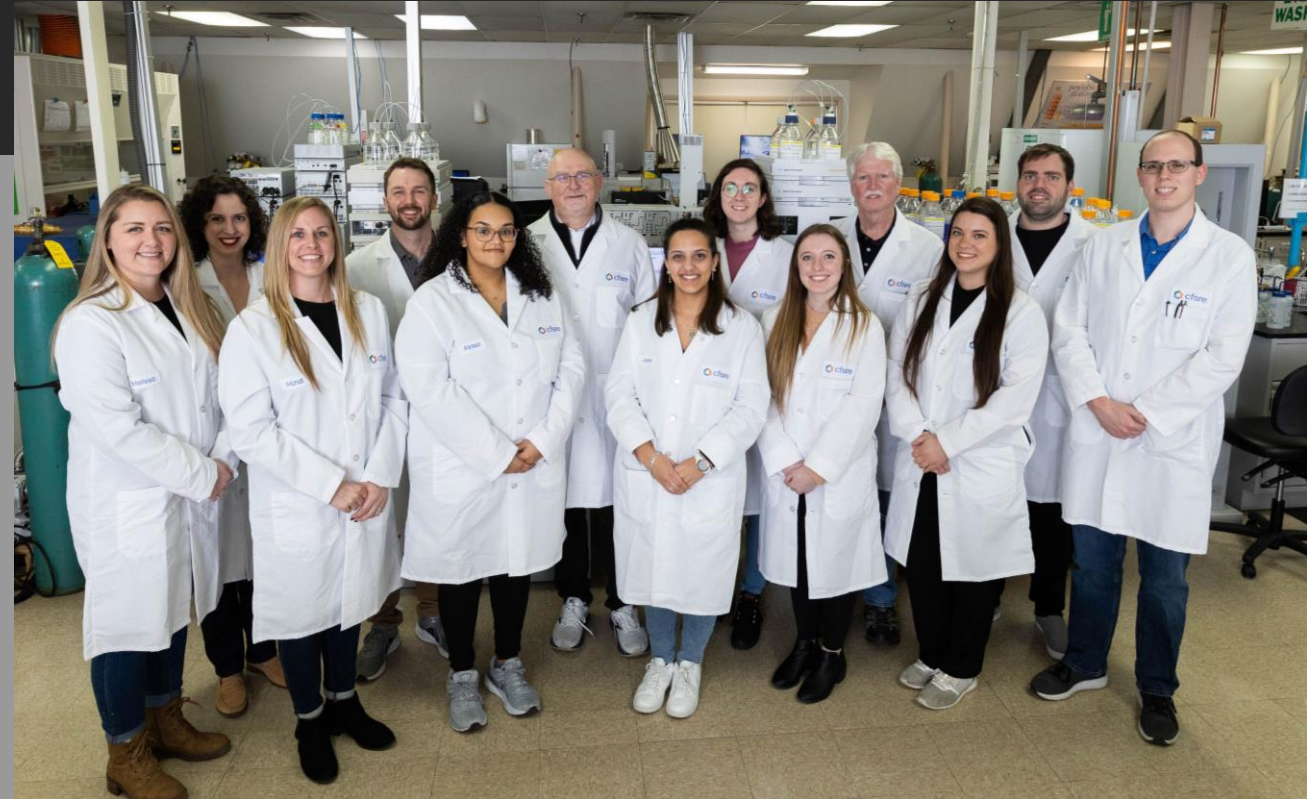
Coming Soon!

Analytical toolkit for medetomidine – differentiated and undifferentiated methodology

Medetomidine MMWR – August 2024

ACKNOWLEDGEMENTS

- Our many collaborations
 - Medical examiners & coroners
 - Toxicology laboratories
 - Hospitals
 - Police departments
 - Public health & safety
- CFSRE Staff
 - Brianna Stang



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