

# Drug Courts and Drug Testing Best Practices

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# Objectives

- Determine best matrix for a particular situation
- Review frequency of testing
- Consider Novel Psychoactive Substances (NPS)
- Dispel myths

Matrix	Pro	Con
Urine	Easy to collect - volume Testing available onsite	Gender matched collection Adulteration Metabolite testing
Blood	Detect recent use Therapeutic ranges	Collection Longer testing turnaround
Oral Fluid	Easy to collect Detect recent use Portable collection devices	Not used for historical use Less research into partition from blood to OF
Hair	Easy to collect Can look for other markers than parent drug	Hair treatments may effect outcome Historical only
Sweat	Passive collection over time Remote monitoring	Limited scope

# Testing Frequency

- Urine is a good matrix for evidence of use
- Twice each week covers a lot of ground – the more frequent, the better the outcome
- Passive testing is a viable option as adjunct testing
  - Ankle, skin/sweat monitors
- Understand the benefits and limitations of each
- Recent use best captured with blood, breath or oral fluid

# Testing Frequency

- Random and consistent is key
- Must include weekends and holidays
- Avoid respite from detection
  - Example: Testing on Monday and Wednesday likely means no test on Thursday
- Limit the delay between notification of the test and collection
  - Within 2 hours from notice to collection

# Testing Frequency

- It is good to choose different matrices to capture all time intervals
  - Sweat – long term
  - Urine – long term
  - Oral fluid – recent
  - Breath – recent
- Testing using varying types of samples ensures full coverage
- Reliability and accuracy of self-reporting

# Testing Frequency

- Understand prescription medications
- Metabolites versus parent drug
- Common treatment medications
  - Opioids use disorder
    - Buprenorphine, methadone, naltrexone
  - Alcohol use disorder
    - Acamprosate, disulfiram, naltrexone

# Witnessed Collection

- Provides integrity for the sample collected – urine is most susceptible
- Ensure lack of dilution
  - Creatinine
  - Specific Gravity
  - Ask for sample first thing in the morning, before any diuretics are consumed
- Adulteration
  - Household chemicals
  - Commercial products
  - Dilution
- Substitution



# Accuracy and Reliability

<b>DETECTION TIME WINDOWS</b>	
<b>URINE</b>	<b>2 – 4 DAYS (Drug metabolites)</b>
<b>ORAL FLUID</b>	<b>24 HOURS</b>
<b>SWEAT</b>	<b>SEVERAL DAYS</b>
<b>BLOOD/BREATH</b>	<b>12-24 HOURS</b>

# Accuracy and Reliability

- Chromatography
  - Gas – GC/MSD
  - Liquid – LC/MSMS
  - Quadrupole Time of Flight – QToF
- Immunoassay
  - Enzyme-Linked Immunosorbent Assay – ELISA
  - Enzyme Multiple Immunoassay Technique – EMIT
  - Lateral flow – Point of Collection Tests (POCT)

# Accuracy and Reliability

- Screening testing
  - Quick and inexpensive way to test a sample
  - EMIT, ELISA, POCT
  - Drawback – potential for increased false positive/negative
- Confirmatory testing
  - Scientific testing at a laboratory
  - Uses same sample collected for screening test
  - Definitive results, eliminates false positive/negative
  - Larger scope of testing
  - Drawbacks – may need a toxicologist to interpret, costly, takes longer for results

# Accuracy and Reliability- Result Interpretation

## **Qualitative**

- Absence or presence
- Best when looking for metabolites in matrix (urine)
- No need for expert interpretation

## **Quantitative**

- Provides concentration of drug, both parent and metabolite
- Difficult to interpret in “historical matrices” (urine, hair, etc)
- Understand the value, or lack of, the number

# Accuracy and Reliability

- Understand the cut off concentrations
  - Decision point between positive and negative
  - Established by the laboratory or overarching regulatory agency
- If using immunoassay, know the cross-reactivity rates
  - Unintentional cross-reactivity can equal false positive results
- Is a lower cutoff best?
  - THC metabolite – excretion
  - Consider a grace period

# Choose the Appropriate Test For the Situation

- Alcohol use
  - SCRAM – Secure Continuous Remote Alcohol Monitor
    - Wireless, remote monitoring
    - The device itself can be a deterrent for substance use
  - Ethyl glucuronide (EtG) and Ethyl Sulfate (EtS)
    - Metabolites of alcohol
    - Urine is typical matrix – can use hair (EtG)
    - Weekly collection and testing
    - Detection time window is longer than for alcohol
    - If no testing/collection on weekend, might be optimal choice

# Choose the Appropriate Test For the Situation

- Opioids and other drug use
  - Urine testing is the best matrix for long-term, historical
  - Oral fluid
    - Recent use only
  - Hair
    - Past use in months, less specific
    - Can also use for cocaine

# Oral Fluid Testing

- Screening versus confirmatory – understand the difference
- Screening – onsite, handheld devices
  - Limited scope
- Confirmatory – laboratory testing
  - Larger scope of testing
  - Interpretation may be limited



# Testing Duration – How Long is Long Enough?

- Good behavior often means less frequent testing
  - Optimal time for relapse
- Consistency in testing is key for positive outcomes
- Monitoring should be maintained throughout the entire program

# Scope of Testing

- NIDA-5 or eight panel test
- Will capture most drugs – but not all
  - THC
  - PCP
  - Opiates\*
  - Amphetamines\*
  - Cocaine
- What about adulterants?

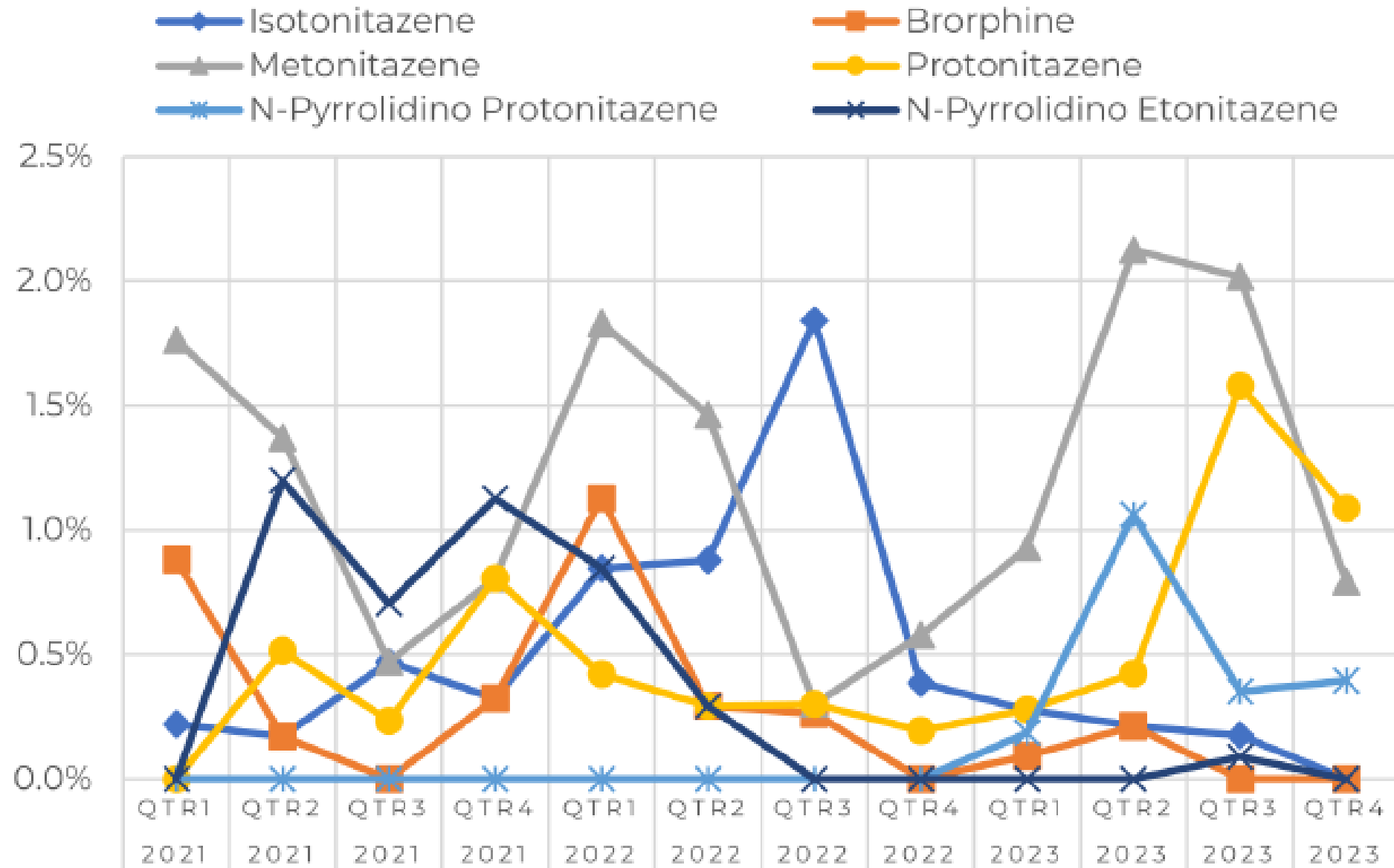
\*Beware of Novel Psychoactive Substances (NPS)

# Scope of Testing – Novel Psychoactive Substances (NPS)

- Know what drugs are trending in your area
- [DEA – NFLIS](#)
- [Center for Forensic Science Research and Education](#)
- [National Poison Control](#)
- [CDC Nonfatal Overdose Dashboards](#)
- [National Drug Early Warning System](#)

# NPS – Opioids: CFSRE

## SELECT POSITIVITY: Q1 2021 to Q4 2023



# NPS - Opioids

- Similar to “common” opioids
- Often, slightly similar chemical composition
- Potency varies
- Legal issues
  - Isomers
  - Analogues
- Precursors can be detected such as 4-ANPP (illicit fentanyl)

# NPS - Opioids

- Kratom

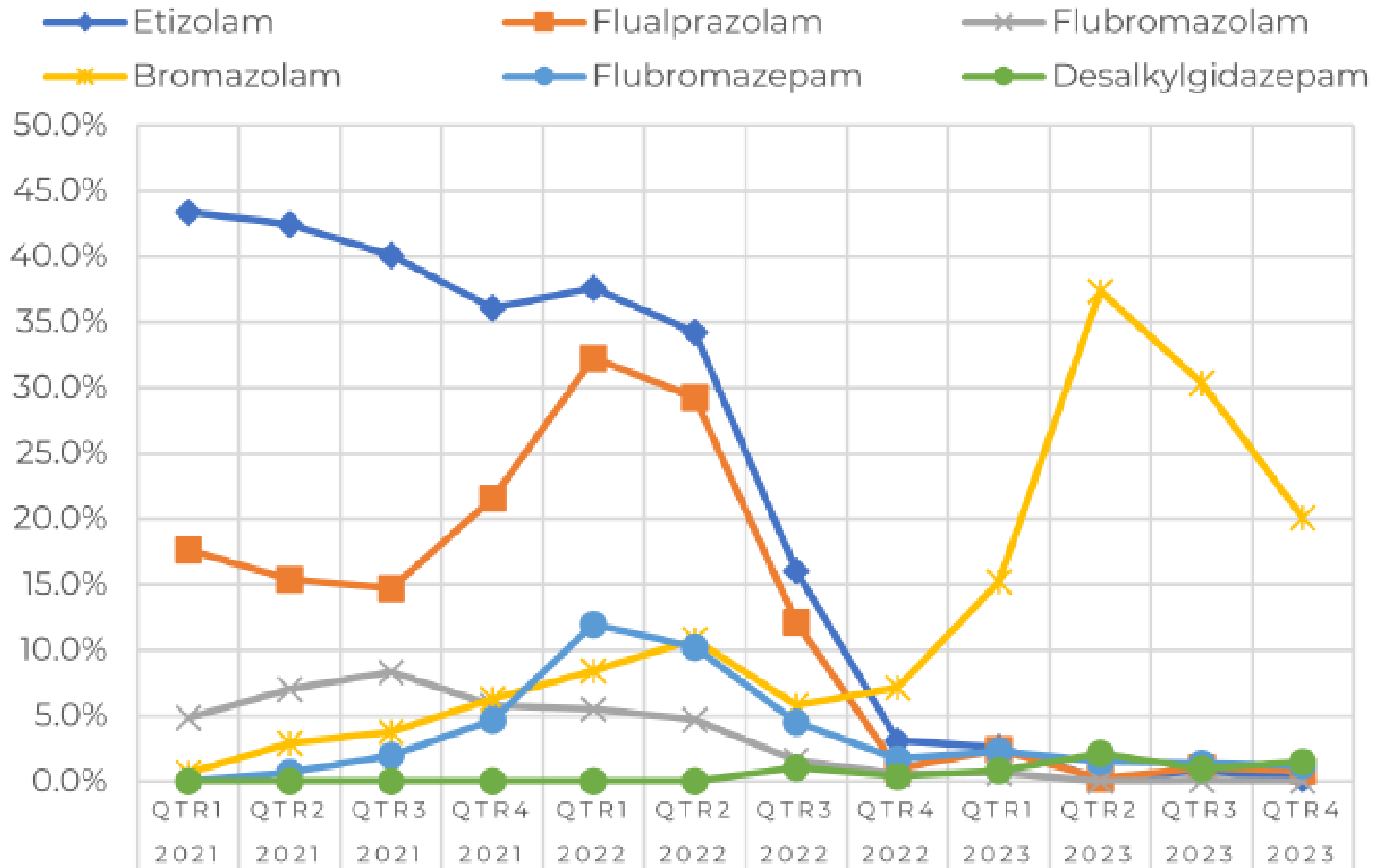
- Mitragynine, 7-OH-Mitragynine
- Low dose – stimulant
- High dose – sedative
- Opioid receptor binding

- Tianeptine

- Mu and delta opioid receptors
- Indirect antidepressant (inhibition of glutamate)
- Touted as an antidepressant, but enhances serotonin instead of inhibit
- Often found OTC, adulterants tend to be more potent

# NPS – Benzodiazepines: CFSRE

## **SELECT POSITIVITY: Q1 2021 to Q4 2023**



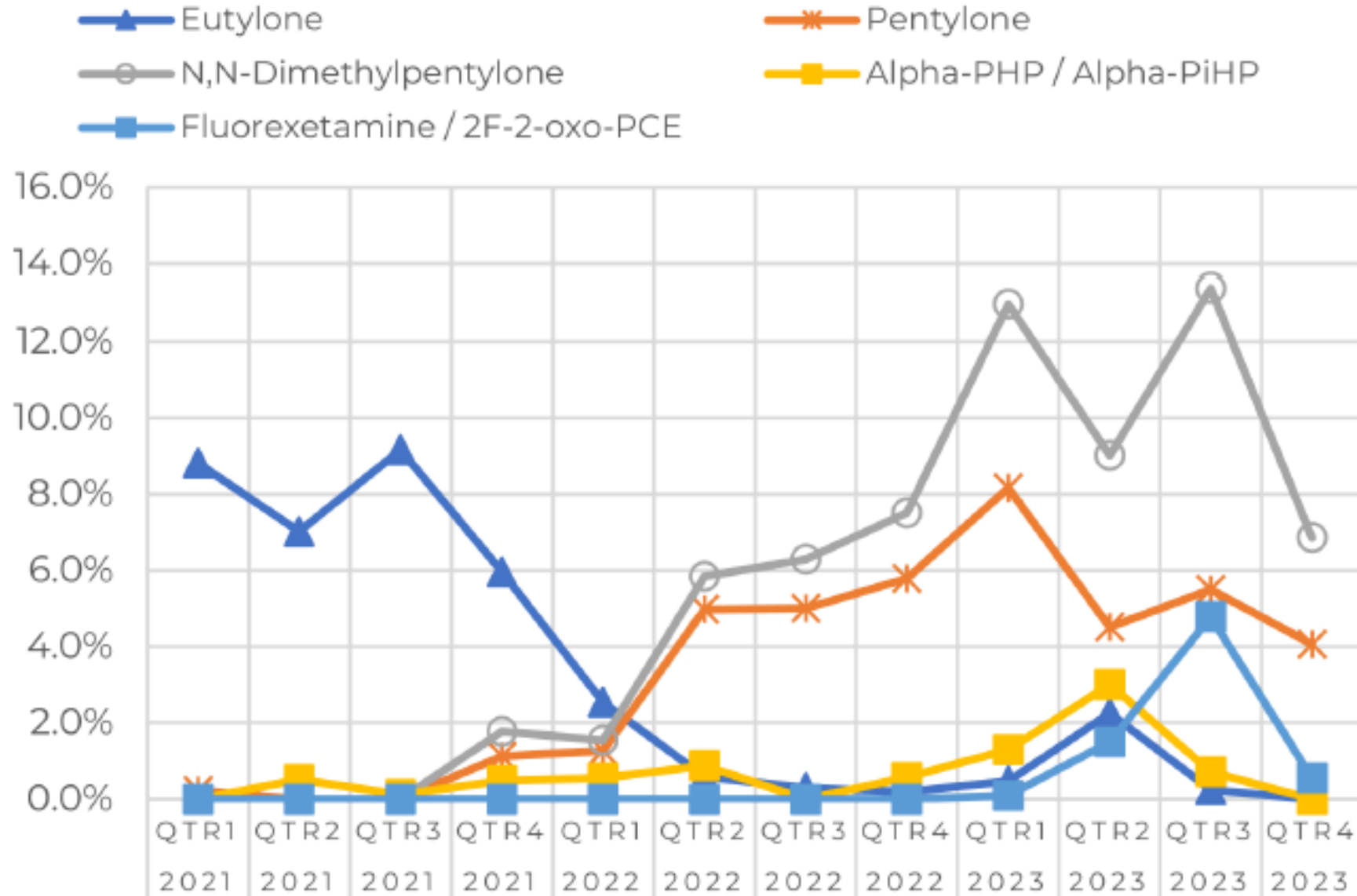
# NPS - Benzodiazepines

- Sound like classic benzodiazepines but have differences in name and structure
  - Clonazepam vs Clonazolam
- The mechanism of action is often the same as prescription benzodiazepines
- Most are not Scheduled or legal in the US
- Most prevalent of the NPS



# NPS – Stimulants and Hallucinogens (CFSRE)

## SELECT POSITIVITY: Q1 2021 to Q4 2023



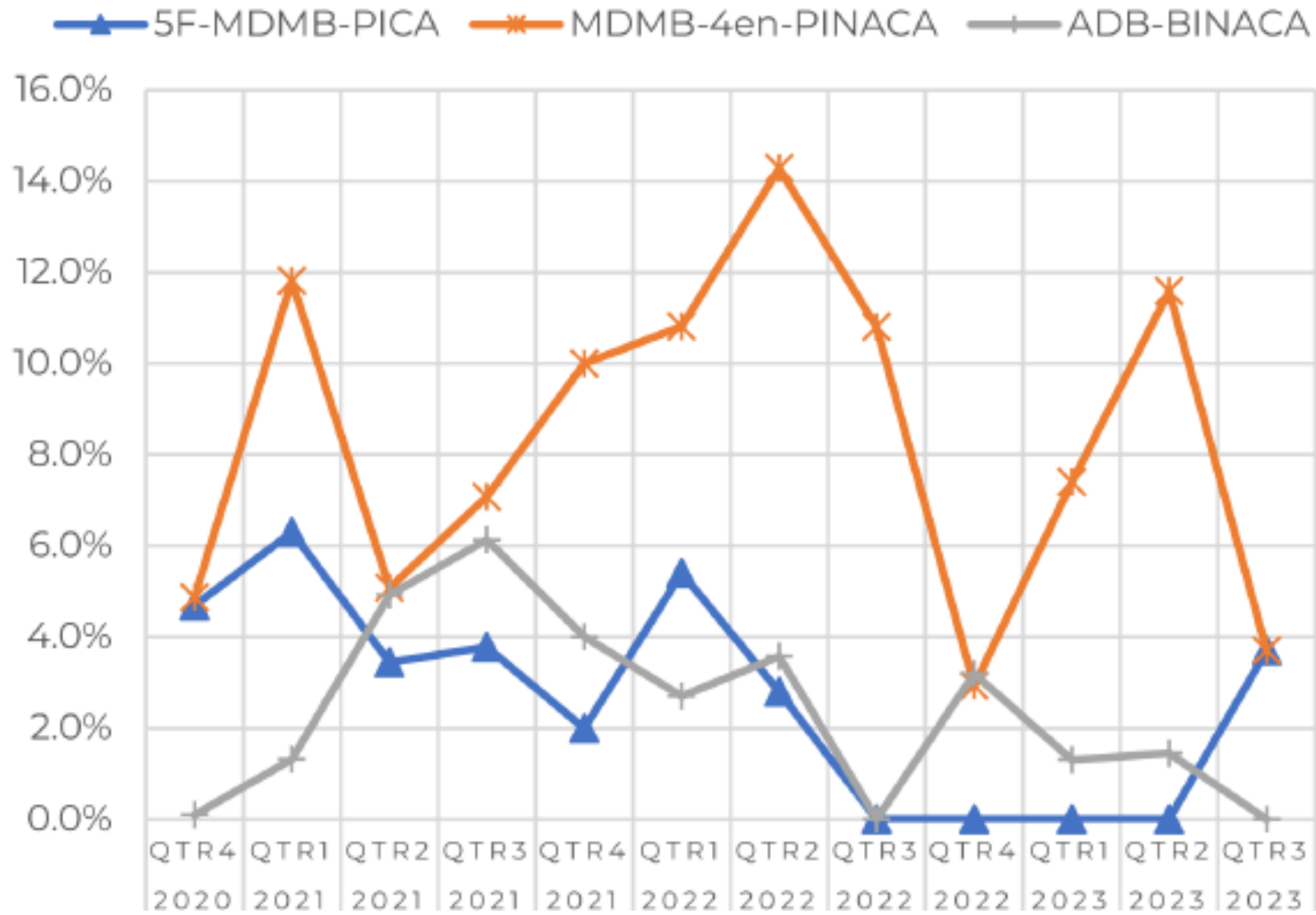
# NPS – Stimulants and Hallucinogens

- Mechanism of action can be different than typical stims and hallucinogens
- Serotonin receptor activity
  - May cause hallucinations
- Dopamine receptor activity
  - Excitatory
- One drug may have both receptor activity

# NPS – Synthetic Cannabinoids (CFSRE)

## **SELECT POSITIVITY: Q4 2020 to Q3 2023**

*Positivity plot does not include Q4 2023 due to low volume and positivity in toxicology samples.*



# NPS – Synthetic Cannabinoids

- Synthesized decades ago for research
- Recreational use began in the 1980's
- Evolution of products
  - Sprayed plant material
  - Smoked plant material
  - Powders, e-liquids for vaping

# NPS – Synthetic Cannabinoids

- Similar to NPS stimulants and hallucinogens in terms of receptor activity
- One synthetic cannabinoid is not the same as another
- Combinations of synthetic cannabinoids to achieve desired effect
- Legal challenges

# NPS – Scope of Testing

- Will not be detected by conventional methods
- POCT are weakest against NPS
- May have cross-reactivity with established POCT devices
- Laboratory confirmation is required

# Adulterants and Cutting Agents

- Water
- Chemicals added to the matrix to interact/interfere with testing
- Diphenhydramine (opioids and stimulants)
- Levamisole (stimulants)
- NPS

# Mythbusters

- Passive inhalation causes positive drug test
- THC adulterated with fentanyl
- Autobrewery (alcohol)
- CBD use will cause a positive drug test



# In Summary...

- Always be aware of the type of testing available
- Understand the limitations of the testing whether it is the scope or the cut off
- Be aware of the drugs trending in your area
- Scrutinize the “tales”

# QUESTIONS

