

# Adolescent Over-the-counter Overdose

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# Learning Objectives

- Discuss risk factors for adolescent overdose
- Review the common OTC (over-the counter) medications involved in suicidal ingestions, misuse/abuse, and clinically significant therapeutic dosing errors
- Discuss implementable strategies to decrease the risk and degree of severity of adolescent overdoses

# Definitions

**Suicidal ingestion:** Intentional, inappropriate, self-harmful use of a substance

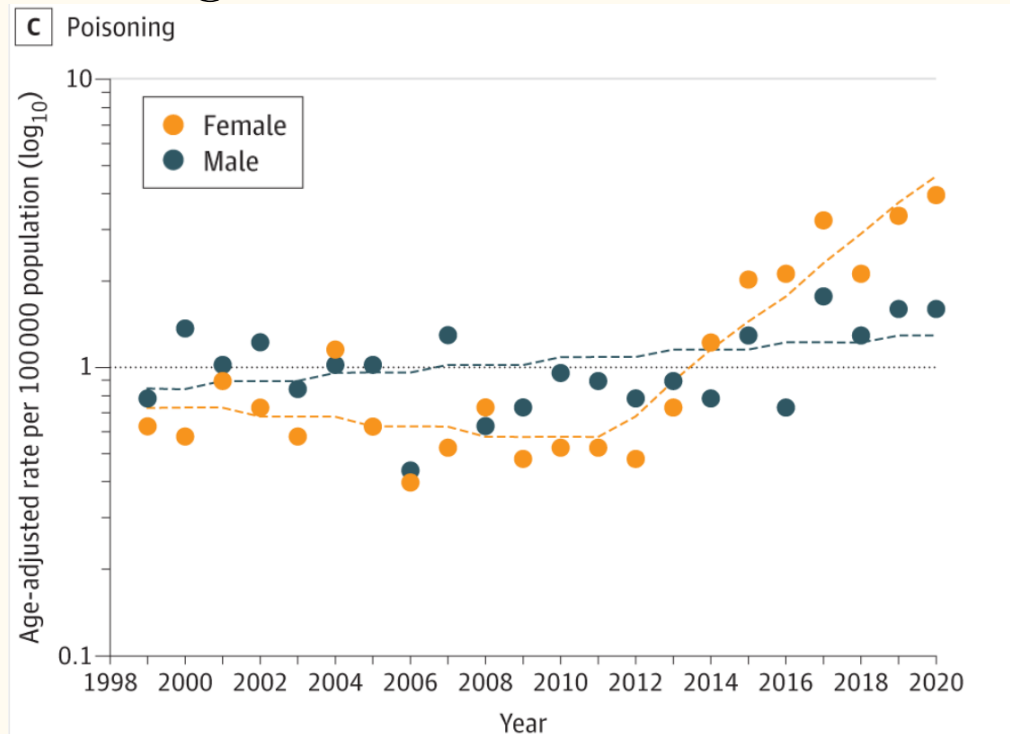
**Misuse:** Intentional improper or incorrect use of a substance for non self-harm reason

**Abuse:** Intentional improper or incorrect use of a substance for recreational (euphoric or psychotropic) reason

**Therapeutic error:** Unintentional deviation from therapeutic regimen

# Why This Matters: Increasing rates

- Increasing mortality rate of adolescent poisoning, particularly females
- Adolescents are the fastest growing population for medication misuse<sup>1</sup>



<sup>1</sup> Gonzales R, Brecht M. L., Mooney L., Rawson R. A. Prescription and over-the-counter drug treatment admissions to the California public treatment system. *J. Subst. Abuse Treat.* 2011;40(3):224–229.

Figure: Ormiston CK, Lawrence WR, Sulley S, et al. Trends in Adolescent Suicide by Method in the US, 1999-2020. *JAMA Netw Open.* 2024;7(3):e244427

# Why This Matters: Adolescent behaviors differ

**Table 8.** Distribution of Reason for Exposure and Age for Fatalities<sup>a</sup>

Reason	≤ 5 y	6 - 12 y	13 - 19 y	≥ 20 y
<b>Unintentional</b>				
Unintentional - General	19	3	1	22
Unintentional - Environmental	3	2	0	24
Unintentional - Occupational	0	0	0	9
Unintentional - Therapeutic error	2	0	0	35
Unintentional - Misuse	0	0	1	15
Unintentional - Bite / sting	0	1	0	6
Unintentional - Food poisoning	0	0	0	1
Unintentional - Unknown	0	0	0	6
<b>Subtotal</b>	<b>24</b>	<b>6</b>	<b>2</b>	<b>118</b>
<b>Intentional</b>				
Intentional - Suspected suicide	0	1	47	752
Intentional - Misuse	0	0	1	72
Intentional - Abuse	0	1	18	134
Intentional - Unknown	0	0	4	81
<b>Subtotal</b>	<b>0</b>	<b>2</b>	<b>70</b>	<b>1,039</b>

<5 yr: Unintentional

6-12 yr: Unintentional, transitioning

13-19 yr: Intentional

>20 yr: Intentional

# Why This Matters: Adolescent behaviors and OTCs

- For all types of overdoses: OTCs are **accessible** and **common!**
- Suicidal ingestions:  
Fewer prescription meds, but can purchase OTC
- Misuse/abuse:  
Teens are more likely to begin intentional, inappropriate substance use
- Therapeutic error:  
Teens are beginning to self-dispense medications at home

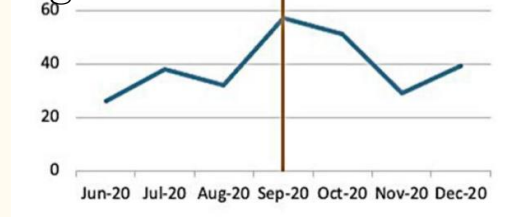
# Adolescent Risk Factors

- Mental health risk factors
  - Mood disorder, personality disorder, substance use disorder
  - **BUT ALSO**
  - Life stress + adolescent impulsivity
- Family history of substance misuse/abuse, intentional overdose, and poor parental supervision
- Peer group behaviors and social pressure
- Male > Female for overall incidence and severe/fatal poisoning
  - However, female adolescents are closing the gap

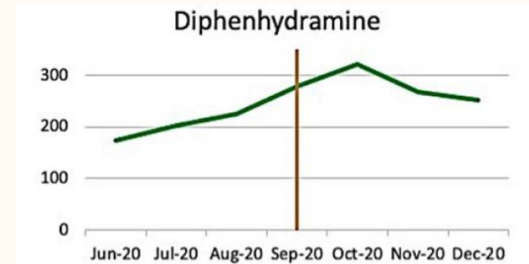
# Peer Group Behaviors: Challenges and social media

- Benadryl challenge, Tide Pod challenge, One Chip challenge, cinnamon challenge...
- Temporal association between Google searches and increased exposures
  - Same-substance suicidal ingestions peaked approximately two months later

Misuse/abuse ingestion  
Diphenhydramine  
ingestion



Suicidal





# Suicidal Ingestion

## OTC Analgesics



Photo: Tylenol.com



Photo: Walgreens.com



Photo: Kroger.com

# Suicidal Ideation



# Misuse

- Misuse accounts for 48% of ED adolescent overdose visits<sup>2</sup>
- Commonly misused/abused substances include **dextromethorphan** and allergy medications (most classically **diphenhydramine**, brand name Benadryl)



Photo: HelpYourTeens.com

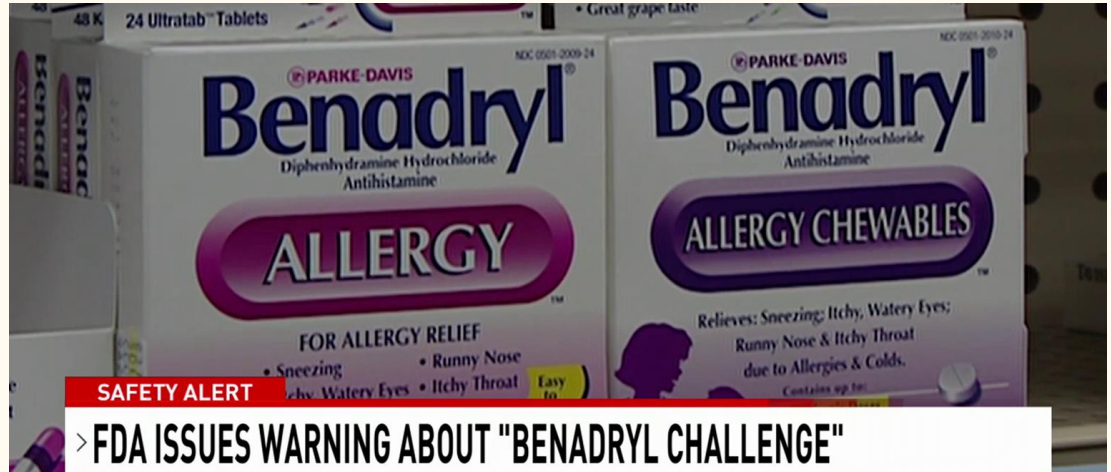


Photo: NBC 15; MyNBC15.com

# Therapeutic Errors

- All medications have the risk for therapeutic error
- Combination medications can lead to unintentional overdosing
  - **Acetaminophen** is particularly notorious for this



What can we do?

# Lockboxes- Not just for prescription medications!

All medications in the home should be placed in a locked bag or box

- Sturdier boxes are preferable over bags in homes with higher risk teens



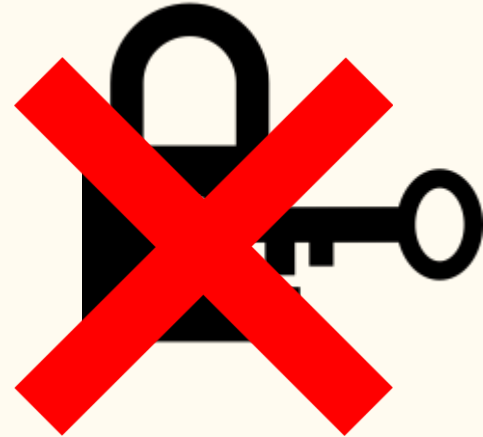
Photo: Cardinal Bag Supplies, Medication Safety Bag



Photo: Levida Medication Lock Box for Safe Medication Storage

# Where to place your medications?

- Place bag or box in public area of home
- Avoid lockable rooms or hidden areas



# Controlled and Supervised Medication Dispensing

- Children: Controlled, supervised dispensing of all medications
- Teens: Gradual self-dispensing with supervision



Photo: Le Bonheur Children's Hospital



# Medication Education

- Active teaching of children and teens to read labels and understand dosing
- Active teaching of children and teens about potential OTC medication toxicity
  - Teaching about the dangers of overdose does NOT increase the risk of intentional overdose!

# Purchase in Moderation

- Many brands now sell very large bottles of medications (“Costco-sized”)
- Easy availability of large quantities =  
Easy availability of large overdose
- Recommend buying only as much medication as is needed in the home
  - Particularly for homes with those at high-risk for intentional overdose!



Photo: Kroger.com

# Warning Signs

- Adults in the adolescent's life (parents, teachers, coaches, physicians)
  - Changes in behavior, mood, appetite, etc.
- Warning signs of increased stress, mental distress, or signs of substance misuse/abuse
- Adolescents can be counseled about signs to watch for concerning behavior within their friend group- “be a good friend, say something”

# Legislative Changes

- UK, 1998- OTC analgesic legislation:
  - Maximum of 16 tablets per OTC box (32 in pharmacy)
  - Blister packaging
- No change in number of exposures
- **43% decrease in fatalities!**
- **61% decrease in acetaminophen liver transplants!**
- Starting Feb 1, 2025, Australia will enact similar legislation



# Summary

- Mortality is low in adolescent OTC overdoses, but overall incidence is increasing
- Risk factors include life stressors, overall mental health, peer group and family environment
- Acetaminophen and aspirin can be dangerous OTC analgesics in overdose
- Diphenhydramine is currently the most popular misuse/abuse OTC

# Strategies to decrease adolescent overdoses

- Secure medication outside of a lockable room
- Supervise dispensing
- Educate adolescents about medication overdose dangers
- **Purchase in moderation!!!**
- Observe for warning signs of misuse/suicidality
- Medication packaging regulation

Questions?

