

Accidental Overdose in Older Adults

Dr. Abby Winter, PharmD, MPA, BCACP

Clinical Assistant Professor | University of Washington School of Pharmacy
 Assistant Director for Outreach | The Plain Center for Geriatric Pharmacy Research, Education & Outreach

"Older adults face unique challenges when it comes to medications, and those challenges increase as medication lists grow. Overdose, specifically accidental overdose, is a particularly concerning issue for our ageing population."

"This session will discuss medication challenges we face as we age, ways to prevent or reduce the risk of accidental overdose in older adults, and strategies to reduce harm if overdose occurs."

2

Outline



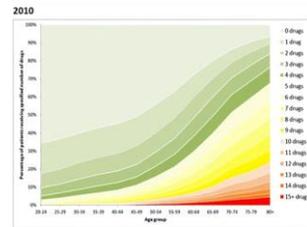
3

Medication Use in Older Adults



4

Medication Use by Age



Guthrie, B., Matubata, B., Hernandez-Santiago, V., et al. The rising tide of polypharmacy and drug-drug interactions: population database analysis 1985-2010. *BMC Med* 13, 74 (2015). <https://doi.org/10.1186/s12916-015-0322-7>

5

Medication Consumption

- Older adults are the highest consumers of medication
- The National Center for Health Statistics conducted a survey of older adults about their medications
 - 90% of people aged 65+ take at least one prescription drug
 - About **half** of people aged 65+ take **5 or more medicines**
 - About **20%** of people aged 65+ have **5 or more chronic medical conditions**
 - More than 40% of people aged 65+ take at least one over-the-counter medicine and at least one supplement

Guthrie et al. *BMC Medicine* 2015;13:74. National Center for Health Statistics. Health, US 2013: With Special Feature on Prescription Drugs. Hyattsville, MD 2014. CDC.gov

6

- "Medications play an important role in the health and wellbeing for many older people." (Donna M. Fick, PhD, RN - co-chair, expert panel for the 2019 AGS Beers' Criteria)
- Medications are a mainstay of modern medicine
 - Used to manage many health conditions
 - Relieve symptoms
 - Reduce risks of future problems
 - Help correct a life-threatening illness

But ...

Medications can also come with risks and side effects!

7

Polypharmacy

(5 or more medications daily)

increases the risk of adverse events from medications

<https://www.uspharmacist.com/article/polypharmacy/> text: Polypharmacy%20increases%20the%20risk%20of%20taking%20two%20or%20more%20medications.

8

Adverse Drug Events (ADEs)

- Unfavorable or unintended reactions or symptoms associated with the use of a medicine
 - In other words...
 - **harm caused by a drug even if its used appropriately and at normal doses**



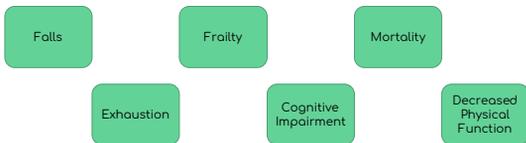
Accidental overdose is an example of an ADE

Sullivan, Janet et al. "Clinical and economic burden of adverse drug reactions." *Journal of pharmacy & clinical therapeutics* 43 (Suppl 1 (2011)): S73-7. doi:10.1111/j.0269-4727.2011.02687.x
 U.S. Department of Health and Human Services. "Adverse Drug Events." Health.gov. <https://health.govourhealth/health-care-quality/adverse-drug-events/ADPE.asp>

9

More medications, more problems?

- Polypharmacy can be associated with adverse health outcomes
- With each additional medication used, the risk of potential harm increases



Page AT, Potter K, Clifford R, Esherton-Beer C. Deprescribing in older people. *Maturitas*. 2016;91:115-134. doi:10.1016/j.maturitas.2016.06.006

10

Medication Use in Older Adults

- Different things can affect how well your body processes, uses, or gets rid of drugs or medications

For example:

- Body composition
- Metabolism
- Organ function
- Diseases and health conditions
- Other drugs you may be taking

As we age, changes in our bodies affect how well medications might work for us

11

Changes ...

With ageing:

- Fat distribution changes
- Liver function can change
- Kidney function changes
 - Function declines by 1% every year after age 50
- This can lead to more Adverse Drug Events



12

The Good News



- Most Adverse Drug Events are **preventable!**
- Specifically, accidental overdose.

13

Accidental Overdose



14

What is an accidental overdose?

Medicines can be toxic if you take too much.

Medicines can also be toxic if you take them at the same time as some other medicines or substances.

An "overdose" is taking a toxic or dangerous dose of a medicine.

An overdose is "accidental" if it was unintentional.

15

Accidental overdoses can happen ...

when a medication is **NOT** taken as prescribed or intended

OR

when a medication **IS** taken as prescribed,
but other factors are at play

16

How can an accidental overdose happen?

- Taking a medicine NOT as prescribed or intended to be used
 - Wrong **number** of pills or wrong **volume** of liquid medicine
 - Incorrect number of **times per day**
 - Continuing to take a medicine after it's been **discontinued** or stopped by your prescriber
 - Continuing to take the **wrong dose** of a medicine after it's been **changed** by your prescriber
 - Taking the **wrong medicine**
 - Intended for a different member of your household
 - Grabbing the wrong bottle or device

17

How can an accidental overdose happen?

- Taking a medicine AS prescribed, but other factors are at play ...
 - Unknown **interaction with another medicine**
 - Can cause levels of one drug to be higher than anticipated
 - Can cause side effects of one medicine to be intensified
 - Interaction with **other substances (alcohol, food, etc.)**
 - Changes in other factors that impact how a drug is processed in the body
 - Organ function, fat distribution, etc.

18

Common errors that can lead to accidental overdose ...

- Pill box gets filled incorrectly
- Forget if a dose was taken, end up with double the dose
- New prescription is filled with a dose change, but the old bottle isn't removed from the rotation or removed from the pill box
- Taking medicines that go by different names but contain the same drug or ingredient, leading to too high of a dose
- Over-the-counter (OTC) medicines
 - Can contain ingredients that are the same or similar to a medicine you're already taking
 - Can cause a drug interaction of which you were not aware

19

Common medications involved in accidental overdose:

Opioids
Acetaminophen
Insulin
Blood Thinners

20

Opioids

- Opioids are a class of medication, sometimes called narcotics
 - Examples of prescription opioids:

- Oxycodone
 - Hydrocodone
 - Morphine
 - Fentanyl
 - Codeine
- Opioids can reduce feeling of pain, increase feelings of pleasure, cause drowsiness
 - If taken at too high of a dose, can slow or stop breathing, decrease heart rate
- Increased risk of adverse events with opioids if they are taken with:
 - alcohol
 - benzodiazepines
 - (e.g. Xanax/alprazolam, Valium/diazepam, Ativan/lorazepam)
 - antipsychotics
 - (e.g. Risperdal/risperidone, Seroquel/quetiapine, Zyprexa/olanzapine, Abilify/aripiprazole)

21

Opioid Overdose

- What can opioid overdose look like?
 - Small "pinpoint" pupils
 - Falling asleep or losing consciousness
 - Slow breathing, or no breathing
 - Choking or gurgling sounds
 - Limp limbs and body
 - Cold or clammy skin
 - Discolored skin
 - Blue, especially lips or nails

https://www.cdc.gov/ostopoverdose/naloxone76_cdf-DDC_Naloxone_PdfSearch_028

22

Opioid Overdose Treatment

- **Naloxone**® - drug that reverses the effects of opioid medications
 - For use when an overdose causes breathing to slow or stop
 - Acts quickly (within 2 to 3 minutes), but wears off quickly too
 - May require multiple doses, especially for stronger opioid medications
 - Available as a nasal spray or an injection

23

Opioid Overdose Treatment

- **Naloxone**®
 - Available at many pharmacies, even without a prescription
 - Anyone can carry it!
 - Good to have on hand if you have a prescription for high-dose opioids, or prescriptions for opioids and benzodiazepines together
 - Can be used if you accidentally overdose, or a visitor or child accidentally gets into your medications
 - Once administered, should get emergency help (911 should be called first)

24

Acetaminophen

- Acetaminophen is a pain relieving and fever reducing medication
 - Brand name: Tylenol®
- One of the most common medications found in households
 - Common ingredient in many cough and cold products, allergy medicines, sleep aids, etc.
- Safe and effective if used appropriately

25

Acetaminophen

- If taken in excess, can be life-threatening
 - Biggest concern is liver damage
 - Especially concerning for heavy alcohol users
- Recommended maximum daily dose = 3,000mg per day
 - *Reduced from previous recommendation of 4,000mg*
- Toxic dose as low as 7,500mg in 8 hours or less

26

Acetaminophen Overdose

- What can acetaminophen overdose (poisoning) look like?
 - Nausea or vomiting
 - Not feeling well
 - Poor appetite
 - Abdominal pain (right upper quadrant)
 - Confusion
 - Low blood pressure
 - Jaundice
 - Altered lab values (especially liver function tests)
- **Could be asymptomatic** (especially if it's within 24 hours of ingestion)

27

Acetaminophen Overdose Treatment

- Different ways to approach acetaminophen overdose
 - 1: prevent absorption of the medicine
 - Activated charcoal
 - 2: Reversal agent / Antidote
 - N-acetylcysteine or NAC (also called "acetylcysteine")
 - 3: Supportive care
 - Including IV fluids or medications to manage other symptoms
- All should be done in a hospital/emergency care setting

28

Blood Sugar Lowering Medications

- Insulin
 - Injectable (or inhaled) medication used to lower blood sugar for patients with diabetes
 - Increased risk of overdose if taken with certain other blood sugar lowering medications
 - (e.g. sulfonylureas like glipizide, glyburide, etc.)
 - Severity of overdose depends on the amount taken, the type of insulin (long acting vs short/rapid acting), time since carbohydrates were consumed (and how many grams)
- Every body responds differently to different amounts of insulin
 - For one person, 10 units could be considered toxic, but another may have to inject more than 100 units to have toxic effects

29

Insulin Overdose

What can taking too much insulin look like?

Low Blood Sugar (defined as < 80 mg/dL)

- Confusion
- Extreme hunger
- Feeling tired
- Irritable
- Sweating or clammy skin
- Shaky or trembling
- In severe cases, loss of consciousness or seizure

30

Insulin Overdose Treatment

- First step: Check your blood sugar
- Treatment: Sugar! (or glucose)
 - Standard treatment of a low blood sugar if not severe:
 - If blood sugar is less than 80 mg/dL:
 - eat 15 grams of fast sugar
 - (15 skittles, ½ cup juice, 6 oz soda)
 - Wait 15 minutes and check blood sugar level again
 - If still less than 80 mg/dL, repeat 15 grams of fast sugar, check in 15 minutes
 - Continue until blood sugar is 80 mg/dL or higher
 - Then follow up with a meal or a carb + protein snack
 - Continue to monitor blood sugar more frequently

If **severe** low (number is very low or seizure or loss of consciousness):

- Call 911
- Glucagon injection if you have it on hand, and call 911
- May require IV or injected glucose

31

Blood Thinning Medications

- Blood thinners are sometimes called "anticoagulant" or "antiplatelet" medicines
 - Prevent blood clots from forming, or prevent clots from getting bigger
- Help reduce risk of heart attack and stroke
- Used to treat blood clots in the legs or lungs
- You may be prescribed a blood thinner if you have:
 - Abnormal heart rhythm
 - Heart valve replacement
 - Deep vein thrombosis (DVT)
 - Certain heart or blood vessel diseases
- Most common:
 - warfarin (Coumadin)
- Others:
 - apixaban (Eliquis)
 - dabigatran (Pradaxa)
 - edoxaban (Savaysa)
 - rivaroxaban (Xarelto)

32

Blood Thinning Medication Overdose

- What can blood thinner overdose cause?
 - Bleeding
 - Internal bleeding
 - Gastrointestinal (GI) bleeding
 - Stroke
 - "Brain bleed"
 - Can be especially concerning if taken with other medications
 - Specifically, NSAIDs (aspirin, ibuprofen, etc.)

33

Blood Thinning Medication Overdose

- If too much of a blood thinner is taken, you may notice:
 - Heavy bleeding after injury, or bleeding that won't stop
 - Pink, red, or dark brown urine
 - Black and tarry or bloody bowel movements
 - Severe stomach pain
- There are MANY drug, food, and alcohol interactions with warfarin
- Changes in diet or changes to other medications can cause warfarin to thin the blood too much
 - This increases the chance of toxicity or overdose

34

Blood Thinning Medication Overdose Treatment

- All of these reversal agents need to be administered in a healthcare/emergency setting
 - warfarin reversal agent: **vitamin K**
 - dabigatran reversal agent: **idarucizumab**
 - apixaban, rivaroxaban, edoxaban reversal agent: **andexanet alfa**
- Other blood thinners do not have reversal agents (though there are some in development), so supportive care is our only option

35

Harm Reduction Strategies



36

When are problems most likely to arise?

- **Transitions of care**
 - For example:
 - From hospital to nursing home or rehab facility
 - From nursing home or rehab facility to home
 - From hospital or Emergency Room to home

37

When are problems most likely to arise?

- After a doctor's appointment
 - Especially if there is a change in medications, or new prescriptions are sent to the pharmacy
- With a new diagnosis requiring treatment
 - Problems could also arise if the new diagnosis causes physiologic changes

PREVENTION

38

39

How can I help prevent accidental overdose?

- Keep a medication list, and update it regularly
 - When a medicine changes or is discontinued, make sure you remove and properly dispose of the old medication

Medication lists should include:

- Name of medication
 - (consider brand and generic name)
- Strength (mg, mcg, units, etc.)
- Dose (number of pills, ml, puffs, etc.)
- Frequency
- What is the medicine used for

40

How can I help prevent accidental overdose?

- Make sure all your doctors and prescribers know **every** medicine you're taking
 - Prescriptions
 - Over-the-counter (OTC) medications
 - Vitamins and supplements
 - Devices (inhalers, nasal sprays, injections, etc.)
 - Topical medications (creams, ointments, etc.)

41

How can I help prevent accidental overdose?

- Consider using one pharmacy for all of your prescriptions
 - Allows the pharmacist to review your medications too
 - Check for drug interactions, helps keep you safe

How can I help prevent accidental overdose?

- Use a pill organizer ("pill box")
- Only fill your pill box one week at a time



42

43

How can I help prevent accidental overdose?

- Take your medications as prescribed
 - Follow instructions
 - Read the prescription label carefully
 - Read the informational leaflet
 - Measure medicines accurately
 - Liquids, injections, etc.
 - Use provided measuring cups (not a household spoon, for example)



44

How can I help prevent accidental overdose?

- **Deprescribing**
 - Talk to your doctor/prescriber about reducing the number of medicines you're taking or reducing the dose of some of your medicines
 - This is a common consideration for patients as they age
 - Your prescriber will take into account many things, including:
 - the reasons you take your medicines, your overall medication or pill burden, the doses of your medicines, risks associated with your medicines (specifically falls, cognitive impairment, etc.) life expectancy, cost, and alternative options

45

How can I help prevent accidental overdose?

- **Avoid interactions**
 - When in doubt, avoid mixing prescription medicines with alcohol
 - Avoid mixing with other supplements and vitamins without first talking to your prescriber or pharmacist
 - Do not start, stop, or change the dose of your medicines without talking to your prescriber or pharmacist
- **Understand what you can and cannot do while taking a medicine**
 - Ask your pharmacist
 - Ask your prescriber

46

How can I help prevent accidental overdose?

- **Appropriate storage of medicines**
 - Cool, dry location, out of reach from kids and pets
 - Medicine cabinets are NOT a good place to keep medicines
 - Lots of moisture and heat in the bathroom is not good for the integrity of medications
 - Instead, consider:
 - Bedside table
 - Kitchen cabinet
 - Kitchen counter (away from heat/steam of the dishwasher or stove)
 - Top shelf of a closet

47

How can I help prevent accidental overdose?

- "Take extra care" with the following medications
 - Acetaminophen
 - Opioids
 - Diabetes medication (especially insulin)

48

Sometimes accidents still happen.
What then?

49

What should I do if I suspect an accidental overdose?

- **Call 911**

- First step, especially if someone is experiencing concerning symptoms, or is found down with a suspected overdose

50

What should I do if I suspect an accidental overdose?

- **Call The Poison Center**
 - **800-222-1222**

- If there's been a poisoning but the person has NOT stopped breathing, collapsed, or had a seizure
- If you're concerned about a possible poisoning
 - Helpful if you realize you've taken too much of a medication but no symptoms requiring immediate medical attention yet
 - (Examples: an accidental second dose, the wrong number of pills, wrong number of units, too many puffs of an inhaler, etc.)

51

What should I do if I suspect an accidental overdose?

- **Talk to your doctor or pharmacist**

- Helpful in non-emergent situations
 - Perhaps you realize you've been taking the wrong dose of your medicine for a while, or you are having side effects that you think might be attributable to taking too much of a medication

52

Summary

- Accidental overdoses do happen, and can be scary
 - The risk associated with prescription medications can increase with age
 - The risk of accidental overdose can increase as the number of daily medications increases
- There are actions you can take to reduce your risk of an accidental overdose
 - When in doubt, talk to your prescriber or pharmacist
- It's always important to know what to do in case of an accidental overdose
 - When in doubt, call 911

53

Q & A

Dr. Abby Winter, PharmD, MPA, BCACP

Clinical Assistant Professor | University of Washington School of Pharmacy
 Assistant Director for Outreach | The Plein Center for Geriatric Pharmacy Research, Education & Outreach
 amwinter@uw.edu

54