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# Inadvertent Intravenous Administration of an Oral Ibuprofen Preparation—A Case Report

Shifa Pharmacy and Pediatrics department published a case report about Inadvertent Intravenous Administration of an Oral Preparation of Ibuprofen in "International Journal of Medical and Pharmaceutical Case Reports—2022"-

The inadvertent intravenous administration of oral liquid medications is a known medication error with high potential for patient harm. We received an incident report in which a pediatric patient accidentally received an oral liquid formulation intravenously. Patient was given first aid and moved to higher level of care to keep under observation. Patient recovered without any consequences. The primary cause of error involved a nursing staff who was new to pediatrics unit and use of injection syringe to administer the oral dose.

Healthcare professionals may not understand the fact that the when routine injection syringes are used to administer liquid oral drugs, the Luer connection on an injection syringe can facilitate mis-administration. Hence there is a global recommendations to dispense and administer unit doses of oral liquid drugs in "oral syringes" that are devoid of luer tip and cannot fit-in with invasive lines/cannula.

# The use of Oral syringes is one of the key Medication Safety targeted best practice recommended by Institute of Safe Medication Practices (ISMP) as well.

<u>Tips for hospital pharmacists and peads Nursing Floors</u>: Oral syringes are not available in Pakistan and nurses routinely use injection syringes for oral liquid administration, as it helps in preventing spill of dose especially in young/non-cooperative children or patients. We recommend that the administering of commercially available and compounded oral liquid medicines should be done using measuring cups, oral dropper or oral syringes. While injection syringes must not be used for this purpose.

This incident prompted Shifa to start a campaign for safe administration of oral drugs in pediatrics, import of Oral syringes specifically designed to avert these kind of accidents and their implementation across the hospital via constant staff and parents' education and monitoring.

**Reference:** Gulzaib, M. (2022). Inadvertent Intravenous Administration of an Oral Preparation of Ibuprofen. *International Journal of Medical and Pharmaceutical Case Reports*, *15*(1), 20-23. https://doi.org/10.9734/ijmpcr/2022/v15i130148

### **Congratulations**





### Association of Antiepileptic's (AED) and Bone Marrow Density (BMD)

Sara Yahya/Sharon Floric, Pharmacist Neurology Point of care pharmacy Anti-epileptic medications include a wide range of drugs including anticonvulsants, benzodiazepines, enzyme inducers or inhibitors, with a multiple effects, leading to "catabolism of vitamin D" and "hypocalcemia" and other

effects that may significantly result in low bone mass and fractures. There is increasing evidence suggesting that epilepsy and its treatment can affect bone mineralization and calcium metabolism. Many studies have shown a significant reduction in bone mineral density in patients treated with classic (phenobarbital, carbamazepine, valproate, etc.) and with new (oxcarbazepine, gabapentin) antiepileptic drugs.

<u>Mechanism</u>: The abnormalities of calcium metabolism were thought to result from the cytochrome P450 enzyme-inducing properties of some antiepileptic drugs and the resultant reduction in vitamin D levels, but the effect of many medications (e.g., valproate) cannot be readily explained by vitamin D metabolism. Limited data exist regarding the newer AEDs. However, Carbonic anhydrase inhibitors, Topiramate and Zonisamide, were linked to increased risk of fractures in a few small studies.

<u>Prevention</u>: Currently, no definitive guidelines established so far for evaluation or treatment. However, **good bone health practices should be adopted** which include regular weight-bearing exercise, adequate sunlight exposure, and adequate intake of calcium and avoidance of risk factors, such as smoking and alcohol use.

Bisphosphonates may be an effective treatment for bone disease in patients receiving AEDs.

**Calcium** supplementation with doses of 1–1.5 gm/day should be offered to all persons using AEDs, particularly in presence of multiple risk factors or documented low BMD.

Prophylaxis with vitamin D has been recommended for all subjects using AEDs, a dose of 800–1000 IU/

day of vitamin D is reasonable as a preventive therapy. For those with documented vitamin D deficiency, treatment with 50,000 IU/ week for 8 weeks has been recommended and can be repeated if vit D levels remain low after initial treatment. This may be followed by supplementation with vitamin D 50,000 IU once a month to maintain the levels above the threshold of insufficiency.

**References:** 1. Pack AM. The association between antiepileptic drugs and bone disease. Epilepsy currents. 2003 May;3(3):91-5. 2. Valsamis HA, Arora SK, Labban B, McFarlane SI. Antiepileptic drugs and bone metabolism. Nutrition & metabolism. 2006 Dec;3(1):1-1. 3. Meier C, Kraenzlin ME. Antiepileptics and bone health. Therapeutic advances in musculoskeletal disease. 2011 Oct;3(5):235-43.

### E-Cigarette Use Increases Odds of Prediabetes, Study Results Show

E-cigarettes are sometimes promoted as a safer alternative or a risk reduction product for those who smoke traditional cigarettes. Individuals who smoke cigarettes are about 30% to 40% more likely to develop type 2 diabetes than individuals who do not smoke, according to the CDC.

E-cigarette use is associated with increased odds of prediabetes, an analysis of data from a large survey representative of the US population showed. The findings, published in *American Journal of Preventive Medicine*, suggested important evidence about the health effects of e-cigarettes that can help shape public health best practices, according to investigators.

<u>What is Prediabetes</u>: presence of impaired fasting glucose (greater than 100–125 mg/dL), impaired glucose tolerance (>140–199 mg/dL 2 hours after a 75-g oral intake of glucose), or hemoglobin A1c between 5.7&–6.4%), which indicate an intermediate glycemic state between normal glycemia and diabetes.

### About the Study:

During 2016-18, among the 600,046 respondents, approximately 66,000 individuals were current e-cigarette users who reported a prediabetes diagnosis. The data also showed that these individuals had a higher prevalence of high-risk lifestyle factors and a worse mental and physical health status than non-smokers. The ORs for prediabetes were 1.54 (95% CI=1.17, 2.04) for sole E-cigarette users and 1.14 (95% CI=0.97, 1.34) for dual users (i.e. both e-cig and combustible cigarettes)

Individuals with diabetes who smoke are also more likely than those who do not smoke to have trouble with insulin dosing and managing their diabetes. This can include other serious health problems involving heart disease, kidney disease, peripheral neuropathy, poor blood low in the legs, and retinopathy.

Prediabetes is a reversible lifestyle that is manageable, according to the statement. Investigators recommend that targeting the reduction in e-cigarette use and educating younger adults could help reduce this risk of diabetes.





Shinza Arshad, Resident Pharmacist





Antibiotic

**Riddles** 

Staphylococcus aureus or "staph" is a type of bacteria found on human skin, in the nose, armpit, groin, and other areas. While these germs don't always cause harm, they can make you sick under the right circumstances. *S. aureus* is the leading cause of skin and soft tissue infections, such as abscesses, boils, furuncles, and cellulitis (red, swollen, painful, warm skin). *S. aureus* germs can also cause more serious infections, such as pneumonia, bloodstream infections, endocarditis (infection of the inner lining of the heart chambers and heart valves), and bone and joint infections.

# *S. aureus* is spread to others by touching infected blood or body fluids, most often by contaminated hands.

#### How can you prevent S. aureus Infections?

To prevent staph infections, practice proper hand hygiene, keep infected areas covered and clean, and avoid sharing personal items like razors, towels, and needles.

# Lets see how good you know the antibiotics!

Arsh Zafar, Resident Pharmacist

| Search the answers in the below table after solving the riddle |   |   |   |   |   |   |   |   |   |   |   |  |
|--|---|---|---|---|---|---|---|---|---|---|---|--|
| Т  | Е | Т | F | R | V | R | Y | U | Ι | Е | 0 |  |
| А  | М | E | R | 0 | Р | E | Ν | Е | М | А | G |  |
| Q  | T | Т | G | L | Ι | Т | I | В | А | В | Е |  |
| U  | Ν | R | В | А | D | Ν | Ι | L | С | Е | Ν |  |
| I  | L | А | S | Ν | Ι | Т | R | 0 | R | Ν | Т |  |
| Ν  | Ι | С | Y | Μ | 0 | R | Н | Т | I | Ζ | А |  |
| 0  | R | Υ | М | Ι | Ν | 0 | С | Υ | L | Ι | Μ |  |
| L  | Ι | С | Т | 0 | R | А | D | 0 | R | Е | Ι |  |
| 0  | С | L | Ι | Ν | Е | Ζ | 0 | L | I | D | С |  |
| Ν  | А | Ι | S | Т | 0 | Р | Ι | 0 | Р | Ι | Ι |  |
| Е  | R | S | Т | R | Е | Х | А | Т | L | М | Ν |  |
| S  | U | L | F | 0 | R | E | Q | Z | А | G | Ν |  |
| Ρ  | Ν | F | Y | F | Х | 0 | L | F | 0 | В | А |  |
| I  | D | Ν | Ι | С | Y | Μ | 0 | С | Ν | А | V |  |

Let me know if the penicillin allergy misbehaves.
I will kick the gram positives out of your airways.
Seek my help if atypicals grow and raise.
Be cautious, I may THROW the ECG waves.

**2.**Against gram negatives, I can fight alone. But for gram positives, do not leave me alone. To kill bugs, taking me once daily is enough. Though, it is also enough to make you deaf.

| <ul><li><b>3.</b>Take me in right way, I will keep the C.diff and positives at bay.</li><li>If you take me too high, your kidneys will die.</li><li>If you take me too rapidly, your skin will get angry.</li></ul> |
|---|
|   |
| 4. For MDR infections; if others resist, I will persist.  |
| Only intravenous do Lexist.   |
| But in war against superbug. I cannot assist.   |
| For dose listen to what your kidney suggest   |
|   |
| 5. Utilize me for VRE not for every infection   |
| Combination with mood stabilizers can destabilize your mood   |
| combination with mood stabilizers can destabilize your mood.  |
| C Against the positive pagetive and unique huge Lam useful  |
| <b>6.</b> Against the positive, negative and unique bugs, Fam userui.   |
| But you have to avoid fun in the sun.   |
| And stay away from me if you are having a baby bump.  |
| If you are a child, I can discolor your bright smile.   |
|   |
| 7. If you recall my class generations, you will get anxious.  |
| For Surgical Site Infection prevention I will be victorious.  |
| And that's my major indication precious.  |
| Administration through IV is obvious.   |
| And through lateral ventricles is seizure-jous  |
|   |
| 8.Two of my members are famed for respiratory indications.  |
| Other one is famed for bone, skin and UTI indications.  |
| Though all can fight against gram negative infections.  |

And increase the risk of tendon inflammation.

Answers: 1. Azithromycin, 2. Gentamicin, 3. Vancomycin, 4.Meropenem, 5. Linezolid, 6.Tetracyclines, 7. Cefazolin 8.Quinolones

# FDA recommends thyroid monitoring in babies and young children who receive injections of iodine-containing contrast media for medical imaging

**Iodinated contrast media (ICM)** is given to patients to enhance the ability to see blood vessels, organs, and tissues on medical images such as X-rays or computed tomography (CT) scans. **The U.S. FDA is advising that rare cases of underactive thyroid have been reported in infants following the use of iodinated contrast media**.

In reported cases, the infants were **either premature**, **had low birth weight**, had a **heart condition**, or **were admitted to a neonatal or pediatric intensive care unit**. Patients with cardiac conditions are also at greatest risk since they often require high doses of contrast during invasive cardiac procedures. Available evidence suggests that this is usually temporary and resolves without treatment or any lasting effects.

FDA has approved a new warning for prescribing information, changes to the labels for ICM injections and monitoring recommendations for children 3 years or younger:

# New borns and children through 3 years old have follow-up thyroid monitoring within 3 weeks after receiving injections of contrast media containing iodine.

Babies and young children typically do not show any visible signs of thyroid problems so Health care professionals should perform appropriate monitoring of patients from birth through 3 years for the possibility of hypothyroidism or a temporary decrease in thyroid hormone levels following exposure to ICM. If thyroid dysfunction is detected, treat it to avoid future cognitive and other developmental disabilities. For

#### FACTS ABOUT Iodinated contrast media (ICM)

Drugs containing iodine are used to enhance the ability to see blood vessels, organs, and tissues during medical imaging procedures

Known as "contrast dye" or "x-ray dye

Used in procedures such as x-rays of blood vessels, joints, and organs, and CT scans

Common side effects of ICM include flushing in the face, nausea or vomiting, mild itchiness and skin rash

Further information: https://www.fda.gov/drugs/drug-safety-and-availability/fda-recommends-thyroid-monitoring-babies-and-young-children-who-receiveinjections-iodine-containing.

| Formulary Updates  | (Visit Shifa Intranet Home Page—click Medication Updates for details) |                           |  |  |  |  |  |  |  |  |  |
|--------------------|---|---------------------------|--|--|--|--|--|--|--|--|--|
| Brand              | Generic   | Class                     | Indications  |  |  |  |  |  |  |  |  |
| Brivace Tablet     | Brivaracetam  | Anti-seizure Drug         | Partial onset seizures   |  |  |  |  |  |  |  |  |
| Ozempic Injection  | Semaglutide   | GLP 1 Agonist             | Diabetes Mellitus type 2, Weight Loss )Chronic)  |  |  |  |  |  |  |  |  |
| Zavicefta          | Ceftazidime/ Avibac-<br>tam   | Cephalosporin combination | HAP/VAP, Intra-abdominal and Complicated Uti infections                                    |  |  |  |  |  |  |  |  |
| Abiraterone tablet | Abiraterone   | Antineoplastic            | Prostate cancer  |  |  |  |  |  |  |  |  |
| Citraflow          | Sod Citrate 4% +<br>Ethanol 30%                                       | Anticoagulant solution    | locking/flushing central venous catheters.   |  |  |  |  |  |  |  |  |
| Tofajak            | Tofacitinib   | JAK inhibitors            | Ankylosing spondylitis ,Rheumatoid arthri-<br>tis ,Ulcerative colitis ,Psoriatic arthritis |  |  |  |  |  |  |  |  |
| Arivan Tablet      | Lorazepam   | Benzodiazepine            | Anxiety, Seizure, substance withdrawal   |  |  |  |  |  |  |  |  |

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## The Most Common Bugs and the Drugs

|                           | Re                        | eferer                   | nce: Sa                        | anford                        | Guic               | le to              | antim                   | nicrob              | pials (                | also                 | check                        | your                      | local             | Anti           | biogr                  | am)                    |                        |                                   |                       |                       |
|---------------------------|---------------------------|--------------------------|--------------------------------|-------------------------------|--------------------|--------------------|-------------------------|---------------------|------------------------|----------------------|------------------------------|---------------------------|-------------------|----------------|------------------------|------------------------|------------------------|-----------------------------------|-----------------------|-----------------------|
| Activity<br>Spectrum      | Enterococcus Faecalis (S) | Enterococcus Faecium (S) | enterococcus Faecalis<br>(VRE) | Enterococcus Faecium<br>(VRE) | Staph. Aureus MSSA | Staph. Aureus MRSA | staph coagulase -ve (R) | Staph epidermis (R) | listeria monocytogenes | Escherichia coli (s) | Escherichia coli, Klebs ESBL | Klebsiella pneumoniae (S) | Proteus mirabilis | Legionella sp. | Neisseria meningitidis | Acinetobacter baumanii | Pseudomonas aeruginosa | Stenotrophomonas malto-<br>philia | Mycoplasma pneumoniae | Clostridum difficille |
| Ampicillin                | ++                        | ±                        | ±                              | ±                             | ±                  | ο                  | ο                       | 0                   | ++                     | ±                    | ο                            | 0                         | +                 | 0              | ++                     | ο                      | 0                      | 0                                 | ο                     | 0                     |
| Amox-Clav                 | +                         | ±                        | ±                              | ±                             | +                  | 0                  | ο                       | 0                   | +                      | +                    | 0                            | +                         | +                 | ο              | ο                      | ο                      | 0                      | ο                                 | 0                     | 0                     |
| Ampicillin-Sulbact        | +                         | ±                        | ±                              | ±                             | +                  | 0                  | 0                       | 0                   | +                      | +                    | ο                            | +                         | +                 | 0              | 0                      | ±                      | 0                      | ο                                 | 0                     | 0                     |
| Pip-Tazo                  | +                         | ±                        | ±                              | ±                             | +                  | Ο                  | Ο                       | 0                   | +                      | +                    | 0                            | +                         | +                 | 0              | +                      | ±                      | +                      | 0                                 | 0                     | 0                     |
| Ertapenem                 | ±                         | 0                        | 0                              | 0                             | +                  | 0                  | 0                       | 0                   | 0                      | +                    | +                            | +                         | +                 | 0              | +                      | 0                      | 0                      | 0                                 | 0                     | 0                     |
| Imipenem                  | +                         | 0                        | 0                              | 0                             | +                  | 0                  | ο                       | 0                   | 0                      | +                    | ++                           | +                         | ±*                | ο              | +                      | ±                      | +                      | 0                                 | 0                     | 0                     |
| Meropenem                 | ±                         | 0                        | 0                              | 0                             | +                  | 0                  | ο                       | 0                   | ±                      | +                    | ++                           | +                         | +                 | ο              | +                      | ±                      | +                      | 0                                 | 0                     | 0                     |
| Ciprofloxacin             | ±*                        | 0                        | 0                              | 0                             | 0                  | 0                  | ο                       | 0                   | 0                      | +                    | ±                            | +                         | +                 | ++             | ο                      | ±                      | +                      | 0                                 | +                     | 0                     |
| Levofloxacin              | +                         | 0                        | 0                              | 0                             | +                  | 0                  | ±                       | ±                   | +                      | +                    | ±                            | +                         | +                 | ++             | ο                      | ±                      | +                      | ±                                 | ++                    | 0                     |
| Moxifloxacin              | +                         | ±                        | 0                              | 0                             | +                  | 0                  | ±                       | ±                   | +                      | +                    | ±                            | +                         | +                 | ++             | Ο                      | ±                      | 0                      | ±                                 | ++                    | 0                     |
| Cefazolin                 | 0                         | 0                        | 0                              | ο                             | ++                 | 0                  | ο                       | 0                   | 0                      | +                    | 0                            | +                         | +                 | ο              | ο                      | ο                      | 0                      | ο                                 | ο                     | 0                     |
| Ceftriaxone               | ±*                        | 0                        | 0                              | ο                             | +                  | 0                  | ο                       | 0                   | 0                      | +                    | 0                            | +                         | +                 | ο              | ++                     | ±                      | 0                      | ο                                 | ο                     | 0                     |
| Ceftazidime               | 0                         | 0                        | 0                              | 0                             | ±                  | 0                  | ο                       | 0                   | 0                      | +                    | 0                            | +                         | +                 | ο              | +                      | ±                      | +                      | ±                                 | ο                     | 0                     |
| Cefepime                  | 0                         | 0                        | 0                              | 0                             | +                  | 0                  | ο                       | 0                   | 0                      | +                    | 0                            | +                         | +                 | ο              | +                      | ±                      | +                      | 0                                 | ο                     | 0                     |
| Ceftazidime-<br>Avibactam | ο                         | ο                        | o                              | 0                             | ±                  | ο                  | ο                       | ο                   | ο                      | +                    | +                            | +                         | +                 | ο              | +                      | ο                      | +                      | ±                                 | ο                     | 0                     |
| Cefixime                  | 0                         | 0                        | 0                              | 0                             | ο                  | 0                  | ο                       | 0                   | 0                      | +                    | 0                            | +                         | +                 | 0              | 0                      | 0                      | 0                      | 0                                 | 0                     | 0                     |
| Gentamicin                | ±*                        | ±*                       | ±*                             | ±*                            | ±*                 | ±*                 | ±*                      | ±*                  | ±                      | +                    | ±                            | +                         | +                 | 0              | ο                      | ο                      | +                      | 0                                 | 0                     | 0                     |
| Tobramycin                | 0                         | 0                        | 0                              | 0                             | 0                  | 0                  | ο                       | 0                   | 0                      | +                    | ±                            | +                         | +                 | ο              | ο                      | ο                      | +                      | ο                                 | ο                     | 0                     |
| Amikacin                  | 0                         | 0                        | 0                              | ο                             | 0                  | 0                  | ο                       | 0                   | 0                      | +                    | ±                            | +                         | +                 | 0              | 0                      | ±                      | +                      | 0                                 | ο                     | 0                     |
| Azithromycin              | 0                         | 0                        | 0                              | ο                             | ±                  | 0                  | ο                       | 0                   | 0                      | ±*                   | ο                            | ο                         | 0                 | ++             | 0                      | ο                      | 0                      | 0                                 | ±                     | 0                     |
| Clarithromycin            | 0                         | ο                        | ο                              | ο                             | ±                  | 0                  | 0                       | ο                   | ο                      | 0                    | ο                            | 0                         | 0                 | ++             | ο                      | 0                      | 0                      | о                                 | ±                     | 0                     |
| Doxycycline               | ±                         | ±                        | ±                              | ±                             | +                  | +                  | ±                       | ±                   | 0                      | ±                    | 0                            | 0                         | 0                 | +              | 0                      | ο                      | 0                      | +                                 | ++                    | 0                     |
| Minocycline               | ±                         | ±                        | ±                              | ±                             | +                  | +                  | ±                       | ±                   | ο                      | ±                    | ο                            | ±                         | ο                 | +              | ο                      | ±*                     | 0                      | +                                 | ++                    | 0                     |
| Tigecycline               | +*                        | +*                       | ±                              | ±                             | +*                 | +*                 | +*                      | +*                  | 0                      | +*                   | +*                           | +*                        | ο                 | ο              | ο                      | +*                     | 0                      | +                                 | +*                    | 0                     |
| Vancomycin                | ++                        | ±                        | 0                              | 0                             | +                  | ++                 | ++                      | ++                  | 0                      | 0                    | 0                            | ο                         | ο                 | ο              | ο                      | ο                      | 0                      | ο                                 | ο                     | ++                    |
| Linezolid                 | +                         | ++                       | ++                             | ++                            | +                  | ++                 | ++                      | ++                  | +                      | 0                    | 0                            | ο                         | ο                 | ο              | ο                      | ο                      | 0                      | ο                                 | ο                     | 0                     |
| Colistin                  | 0                         | 0                        | 0                              | 0                             | 0                  | 0                  | ο                       | 0                   | 0                      | +                    | +                            | +                         | 0                 | 0              | ο                      | +                      | +                      | +                                 | 0                     | 0                     |
| Chloramphenicol           | ±                         | ±                        | ±                              | ±                             | +                  | +                  | +                       | +                   | 0                      | +                    | ±                            | +                         | 0                 | 0              | +                      | 0                      | 0                      | +                                 | 0                     | 0                     |
| TMP-SMX                   | 0                         | 0                        | 0                              | ο                             | +                  | +                  | +                       | +                   | +                      | ±                    | ±                            | ±                         | ±                 | +              | 0                      | ±                      | 0                      | ++                                | 0                     | 0                     |
| Nitrofurantoin            | +                         | +                        | +                              | +                             | 0                  | 0                  | 0                       | 0                   | 0                      | +                    | ±                            | +                         | 0                 | 0              | 0                      | 0                      | 0                      | 0                                 | 0                     | 0                     |
| Fosfomycin (IV)           | ±                         | ±                        | ±                              | ±                             | ±*                 | ±*                 | ±                       | ±                   | 0                      | +                    | +                            | ±                         | +                 | 0              | 0                      | 0                      | 0                      | 0                                 | 0                     | 0                     |
| Fosfomycin (PO)           | +                         | +                        | +                              | +                             | 0                  | 0                  | 0                       | 0                   | 0                      | +                    | +                            | ÷                         | +                 | 0              | 0                      | 0                      | 0                      | 0                                 | 0                     | 0                     |