PTCB Practice Test: 90 Questions with Answers

A full-length practice exam weighted to the 2026 PTCE content outline. Answer key with explanations at the end.

Source: ptcbquizprep.com. Questions written from primary sources (PTCB outline, DEA, FDA, ISMP). Last reviewed July 15, 2026.

1. Lipitor is the brand name for which generic medication?

A. Rosuvastatin
B. Simvastatin
C. Atorvastatin
D. Pravastatin

2. To which drug class does metformin belong?

A. Biguanides
B. Sulfonylureas
C. Thiazolidinediones
D. DPP-4 inhibitors

3. A patient taking lisinopril reports a persistent, dry, nagging cough. This side effect is most characteristic of which drug class?

A. Beta blockers
B. Calcium channel blockers
C. Angiotensin II receptor blockers
D. ACE inhibitors

4. Synthroid is a brand name for which generic drug?

A. Liothyronine
B. Levothyroxine
C. Methimazole
D. Propylthiouracil

5. Amlodipine (Norvasc) is primarily prescribed to treat which of the following?

A. Chronic heart failure exacerbations
B. Peptic ulcer disease
C. High blood pressure and angina
D. Hypothyroidism

6. Toprol-XL (metoprolol succinate) belongs to which drug class?

A. Calcium channel blockers
B. Beta blockers
C. ACE inhibitors
D. Alpha-1 blockers

7. A patient started on amlodipine returns complaining of swelling in the ankles and feet. Which side effect of amlodipine does this represent?

A. Swelling of the ankles and feet (peripheral edema)
B. Persistent dry cough
C. Elevated potassium
D. Slow heart rate

8. Prilosec is the brand name for which generic medication?

A. Pantoprazole
B. Famotidine
C. Ranitidine
D. Omeprazole

9. Omeprazole and pantoprazole are both classified as which type of medication?
A. Histamine-2 (H2) receptor antagonists
B. Proton pump inhibitors
C. Antacids
D. Prokinetic agents

10. Cozaar is a brand name for which generic medication?
A. Valsartan
B. Candesartan
C. Losartan
D. Olmesartan

11. A prescription for losartan (Cozaar) is presented at the pharmacy. Losartan is a member of which drug class?
A. Angiotensin II receptor blockers (ARBs)
B. ACE inhibitors
C. Beta blockers
D. Direct renin inhibitors

12. A patient with asthma is given a ProAir HFA (albuterol) inhaler to use for sudden shortness of breath. Albuterol works as which type of agent?
A. Inhaled corticosteroid
B. Leukotriene receptor antagonist
C. Long-acting muscarinic antagonist
D. Short-acting beta2-agonist bronchodilator

13. A patient using albuterol notices shakiness and a fine tremor of the hands. Which common side effect of albuterol is this?
A. Fine tremor and nervousness
B. Slow heart rate
C. Constipation
D. Weight gain

14. Neurontin is the brand name for which generic medication?
A. Pregabalin
B. Gabapentin
C. Topiramate
D. Levetiracetam

15. In addition to controlling partial seizures, gabapentin (Neurontin) carries an FDA-approved indication for relieving which type of pain?
A. Acute migraine
B. Fibromyalgia pain
C. Rheumatoid arthritis pain
D. Postherpetic neuralgia

16. Zoloft (sertraline) is classified as which type of antidepressant?
A. Tricyclic antidepressant
B. Monoamine oxidase inhibitor (MAOI)
C. Selective serotonin reuptake inhibitor (SSRI)
D. Serotonin-norepinephrine reuptake inhibitor (SNRI)

17. Imitrex (sumatriptan) is used for the acute treatment of migraine. It belongs to which drug class?
A. Ergot alkaloids
B. Nonsteroidal anti-inflammatory drugs
C. Beta blockers
D. Triptans (serotonin 5-HT receptor agonists)

18. A patient is prescribed Cymbalta (duloxetine) for depression along with diabetic nerve pain. Duloxetine belongs to which class?

A. Serotonin-norepinephrine reuptake inhibitor (SNRI)
B. Selective serotonin reuptake inhibitor (SSRI)
C. Tricyclic antidepressant
D. Benzodiazepine

19. Hydrochlorothiazide is best classified as which type of diuretic?

A. Loop diuretic
B. Thiazide diuretic
C. Potassium-sparing diuretic
D. Osmotic diuretic

20. Lasix is the brand name for which generic medication?

A. Bumetanide
B. Torsemide
C. Furosemide
D. Spironolactone

21. A standard National Drug Code (NDC) is a 10-digit number divided into three segments. What do the three segments identify, in order from first to last?

A. Product, labeler, package
B. Package, product, labeler
C. Labeler, product, package
D. Labeler, package, product

22. Which segment of the National Drug Code is assigned directly by the FDA rather than by the drug company?

A. The labeler code
B. The product code
C. The package code
D. Both the product and package codes

23. Within an NDC, the middle (product code) segment identifies which set of characteristics?

A. The package size and container type
B. The manufacturer's corporate identity
C. The lot number and expiration date
D. The specific strength, dosage form, and formulation

24. A pharmacy stocks the same manufacturer's lisinopril 10 mg tablets in both a 100-count bottle and a 1,000-count bottle. Which part of the NDC will be different between the two bottles?

A. The labeler code
B. The package code
C. The product code
D. Nothing; both bottles share an identical NDC

25. Which of the following is NOT one of the FDA-assigned 10-digit NDC configurations?

A. 4-4-2
B. 5-3-2
C. 5-4-2
D. 5-4-1

26. Under USP compounding standards, the beyond-use date (BUD) of a compounded preparation is calculated starting from what point in time?

A. The date or time the preparation is compounded
B. The earliest expiration date of the ingredients used
C. The date the preparation is dispensed to the patient
D. The date the patient takes the first dose

27. Per USP <795>, what is the maximum beyond-use date for a compounded nonsterile aqueous oral preparation that contains NO preservative?

A. 35 days
B. 14 days
C. 90 days
D. 180 days

28. A pharmacist compounds an oral suspension that contains an added preservative. Under USP <795>, what is the longest beyond-use date that may be assigned?

A. 14 days
B. 90 days
C. 180 days
D. 35 days

29. A conventionally manufactured multiple-dose vial is first punctured on March 1. The manufacturer's labeling gives no in-use time limit. Per USP standards, when must the vial be discarded?

A. On the manufacturer's printed expiration date
B. 14 days after the first puncture
C. 28 days after the first puncture (March 29)
D. 48 hours after the first puncture

30. According to the FDA, what does the expiration date printed on a manufactured drug product actually represent?

A. The date after which the drug becomes immediately toxic
B. The period during which the drug is known to remain stable, retaining its strength, quality, and purity under labeled storage conditions
C. The last date the pharmacy may legally purchase the product
D. A marketing date chosen by the wholesaler

31. A parent picks up a reconstituted amoxicillin oral suspension and asks how long it can be used. What should they be told?

A. Discard any unused portion after 7 days
B. It is good until the expiration date on the stock bottle
C. Discard any unused portion after 28 days
D. Discard any unused portion after 14 days

32. An insulin vial has been opened and kept at room temperature between 59°F and 86°F. According to FDA guidance, after how many days should it no longer be used?

A. 28 days
B. 14 days
C. 7 days
D. 90 days

33. Within pharmacy practice, what does the abbreviation LASA describe?

A. Medications that require refrigerated storage and special labeling
B. Drugs with a narrow therapeutic index that require routine lab monitoring
C. Drug names that look alike in print or sound alike when spoken
D. Controlled substances with a high potential for diversion

34. According to the ISMP List of Confused Drug Names, the antihistamine hydrOXYzine is commonly confused with which medication?

A. hydrALAZINE
B. hydrocortisone
C. Hyzaar
D. Hycamtin

35. A prescriber sends an e-prescription for traZODone 50 mg at bedtime and adds the note 'for insomnia.' According to ISMP, how does including the purpose of a medication help prevent errors?

A. It allows the technician to substitute a therapeutically equivalent product without approval
B. It lets the pharmacy bill the insurer at a higher reimbursement rate
C. It removes the need for barcode verification during filling
D. It helps staff distinguish the intended drug from look-alike or sound-alike names such as traMADol

36. A technician can only read 'Cele___ 20 mg daily' on a faxed order for a patient with a history of depression, so the pharmacist calls the prescriber to confirm. Which documented ISMP LASA group made this clarification essential?

A. Celestone, Cipro, and Cymbalta
B. CeleXA, CeleBREX, and Cerebyx
C. Cetirizine, Cardizem, and Colace
D. Cephalexin, Cozaar, and Cortef

37. A hospital technician restocking insulin notices NovoLOG Mix 70/30 stored directly beside NovoLIN 70/30. Based on the ISMP List of Confused Drug Names, why does this arrangement create risk?

A. Insulin pens and vials may never share the same refrigerator shelf
B. NovoLOG and NovoLIN are a documented look-alike/sound-alike insulin pair
C. The 70/30 designation is prohibited on hospital insulin labels
D. Premixed insulins must always be stored at room temperature

38. Per the ISMP List of Confused Drug Names, ZyPREXA (olanzapine) has been confused with which commonly stocked allergy medication?

A. Allegra (fexofenadine)
B. Claritin (loratadine)
C. Xyzal (levocetirizine)
D. ZyrTEC (cetirizine)

39. While filling a prescription for metFORMIN 500 mg, a technician accidentally pulls a stock bottle of metroNIDAZOLE 500 mg from a nearby shelf. Which safeguard is specifically designed to catch this wrong-drug error during the filling step?

A. Scanning the stock bottle barcode so the system verifies the NDC against the entered prescription
B. Counting the tablets twice on a dedicated counting tray
C. Rechecking the days' supply calculation printed on the label
D. Asking the patient to confirm their date of birth at pickup

40. Which drug appears on the ISMP List of Confused Drug Names as commonly confused with busPIRone?

A. buprenorphine
B. butalbital
C. buPROPion
D. bumetanide

41. Which ISMP LASA pair is especially dangerous in a community pharmacy because both members also belong to a class on ISMP's community/ambulatory high-alert list (oral hypoglycemic agents)?

A. Paxil and Plavix
B. Flonase and Flovent
C. Zantac and Xanax
D. glipiZIDE and glyBURIDE

42. A labor-and-delivery order for oxytocin is misread and OxyCONTIN is nearly dispensed. According to the ISMP List of Confused Drug Names, which additional long-acting opioid is also paired with OxyCONTIN?

A. MS Contin
B. Motrin
C. Methergine
D. Mucomyst

43. What is the primary purpose of tall man lettering, as in vinBLAStine and vinCRIStine?

A. To indicate that a drug is available only under its brand name
B. To capitalize the dissimilar letters so look-alike drug names are easier to tell apart
C. To mark medications that must be stored in the refrigerator
D. To show which syllable is stressed when pronouncing the name

44. Per the FDA Name Differentiation Project list, which is the recommended tall man presentation for the corticosteroid prednisone?

A. PREDnisone
B. predNISone
C. predniSONE
D. prednisONE

45. When the FDA determines that tall man lettering should address confusion between an established drug name pair, how is the change implemented?

A. FDA requests that the manufacturer voluntarily revise its labels and labeling to use tall man letters
B. FDA suspends the drug's approval until a new name is assigned
C. FDA requires the USAN Council to issue a completely new generic name
D. FDA adds a boxed warning describing the name confusion

46. Under ISMP's CD3 rule for constructing tall man letters, where does capitalization begin?

A. Capitalize the first three letters of every look-alike drug name
B. Capitalize only the final syllable of the longer drug name
C. Capitalize alternating letters throughout the entire name
D. Working from the left of the name, capitalize once two or more dissimilar letters are encountered

47. A technician is printing warning labels for the chemotherapy storage shelf. Which pair matches the FDA's recommended tall man lettering for the two look-alike platinum agents?

A. CISPLATin and CARBOPLATin
B. cisPLATIN and carboPLATIN
C. CISplatin and CARBOplatin
D. CisplatIN and CarboplatIN

48. Which statement best reflects ISMP's current position on the effectiveness of tall man lettering?

A. Tall man lettering by itself has been proven to eliminate wrong-drug errors
B. The evidence is mixed, but tall man lettering is worth implementing as one of numerous strategies against name confusion
C. ISMP has withdrawn its tall man letters list pending further research
D. Tall man lettering is legally required on all generic drug labeling

49. Which statement correctly defines a high-alert medication?
A. A drug that is involved in errors more often than any other medication
B. A drug that must always be stored in a locked safe with a perpetual inventory
C. A drug that requires REMS program enrollment before dispensing
D. A drug that bears a heightened risk of causing significant patient harm when it is used in error

50. Which class of drugs appears on the ISMP List of High-Alert Medications in Acute Care Settings?
A. Neuromuscular blocking agents such as succinylcholine, rocuronium, and vecuronium
B. Proton pump inhibitors such as omeprazole
C. HMG-CoA reductase inhibitors such as atorvastatin
D. Topical antifungals such as clotrimazole

51. Which specific medication did ISMP add to its List of High-Alert Medications in Acute Care Settings in the 2024 update?
A. Naloxone injection
B. Tolvaptan
C. Tranexamic acid injection
D. Alprostadil

52. On the ISMP acute care high-alert list, which insulin product is singled out for special emphasis?
A. Insulin glargine U-100
B. Insulin U-500
C. NPH insulin
D. Insulin lispro U-100

53. A nurse removes a 250 mL bag from the heparin bin of an automated dispensing cabinet, and barcode scanning before administration reveals it is actually potassium chloride for injection concentrate. What does this reported event best illustrate?
A. Barcode scanning acting as a final safeguard that caught a look-alike storage error involving two high-alert drugs
B. A prescribing error that only the physician could have prevented
C. An acceptable substitution because both products are intravenous solutions
D. A billing discrepancy with no patient safety significance

54. A new prescription reads: "Amoxicillin 500 mg, i cap PO BID x 10 days." Which set of patient directions correctly translates this sig?
A. Take one capsule by mouth once daily for 10 days
B. Take two capsules by mouth once daily for 10 days
C. Take one capsule by mouth twice daily for 10 days
D. Take one capsule by mouth every other day for 10 days

55. The abbreviation AC in a prescription sig instructs the patient to take the dose at what time?
A. Before meals
B. After meals
C. At bedtime
D. In the morning

56. A technician is entering a prescription for timolol 0.5% ophthalmic solution with the sig "1 gtt OS BID." How should the directions read on the label?
A. Instill 1 drop in the right eye twice daily
B. Instill 1 drop in the left eye twice daily
C. Instill 1 drop in each eye twice daily
D. Instill 1 drop in the left ear twice daily

57. A prescription for nitroglycerin 0.4 mg tablets carries the sig "i tab SL PRN chest pain." What do these directions tell the patient to do?

A. Swallow one tablet whole every day to prevent chest pain
B. Chew one tablet with water at the first sign of chest pain
C. Insert one tablet rectally as needed for chest pain
D. Dissolve one tablet under the tongue as needed for chest pain

58. A sig ending in "HS" directs the patient to take the medication at what time?

A. With the first meal of the day
B. At bedtime
C. Every hour as needed
D. One hour before lunch

59. An otic prescription is written as "ii gtt AU BID." Which directions belong on the label?

A. Instill 2 drops into each ear twice daily
B. Instill 2 drops into the right ear twice daily
C. Instill 2 drops into each eye twice daily
D. Instill 11 drops into the left ear once daily

60. A prescriber writes "Sucralfate 1 g, i tab PO AC & HS." Assuming the patient eats three meals daily, how many tablets will the patient take in one full day?

A. Two tablets
B. Three tablets
C. Four tablets
D. Six tablets

61. Which sig abbreviation indicates that a medication should be taken four times a day?

A. QD
B. QOD
C. Q4H
D. QID

62. A faxed prescription contains the handwritten frequency "QOD." According to the ISMP error-prone abbreviations list, why does this abbreviation create risk during order entry?

A. It can be misread as QD (daily) or QID (four times daily)
B. It can be misread as a Roman numeral quantity
C. It is only approved for use on veterinary prescriptions
D. It refers to two different routes of administration

63. A prescription for prednisone 10 mg reads "ss tab PO QAM." What dose should the patient take?

A. One tablet every morning
B. One-half tablet every morning
C. Two tablets every other morning
D. One-half tablet every evening

64. A prescription is dispensed for 60 lisinopril tablets with the sig "i tab PO BID." What days supply should the technician enter on the claim?

A. 15 days
B. 20 days
C. 30 days
D. 60 days

65. A patient drops off a prescription for metformin 500 mg, #120, with directions to take 2 tablets by mouth twice daily. What is the correct days supply?

A. 60 days
B. 45 days
C. 40 days
D. 30 days

66. A cephalexin oral suspension is dispensed as 150 mL with the sig "5 mL PO TID." How many days will the bottle last?

A. 10 days
B. 15 days
C. 30 days
D. 7 days

67. One 10 mL vial of insulin glargine (100 units/mL) is dispensed for a patient who injects 35 units at bedtime. What days supply should be submitted?

A. 35 days
B. 28 days
C. 25 days
D. 30 days

68. A box of five 3 mL insulin lispro pens (100 units/mL) is dispensed to a patient using 25 units before breakfast and 25 units before dinner. What is the days supply?

A. 15 days
B. 25 days
C. 30 days
D. 60 days

69. A 5 mL bottle of an ophthalmic solution is dispensed with the sig "1 gtt OU BID." Using the standard conversion of 20 drops per mL, what days supply should the technician enter?

A. 25 days
B. 50 days
C. 100 days
D. 12 days

70. An albuterol inhaler labeled as containing 200 metered actuations is dispensed with directions of 2 puffs QID. What is the days supply?

A. 50 days
B. 100 days
C. 12 days
D. 25 days

71. A prednisone taper is written using only 10 mg tablets: 40 mg daily for 3 days, then 20 mg daily for 3 days, then 10 mg daily for 3 days. How many tablets should be dispensed to complete the taper?

A. 18 tablets
B. 21 tablets
C. 24 tablets
D. 27 tablets

72. Lactulose solution is dispensed as a 240 mL bottle with directions of 1 tablespoonful (15 mL) by mouth twice daily. What days supply applies to this claim?

A. 16 days
B. 4 days
C. 8 days
D. 12 days

73. A prescriber writes "brand medically necessary" on a prescription for Synthroid and does not authorize substitution. Which DAW code belongs on the claim?

A. DAW 1
B. DAW 0
C. DAW 2
D. DAW 5

74. Under the Controlled Substances Act, a drug with a high potential for abuse and no currently accepted medical use in the United States is placed in which schedule?

A. Schedule I
B. Schedule II
C. Schedule III
D. Schedule V

75. Ketamine and anabolic steroids such as testosterone are both assigned to which federal controlled substance schedule?

A. Schedule II
B. Schedule IV
C. Schedule III
D. Schedule V

76. A pharmacy technician is entering a new prescription for tramadol 50 mg tablets. Under federal law, how is tramadol classified?

A. It is a noncontrolled prescription drug
B. It is a Schedule IV controlled substance
C. It is a Schedule II controlled substance
D. It is a Schedule V controlled substance

77. A cough preparation containing no more than 200 milligrams of codeine per 100 milliliters belongs to which federal schedule?

A. Schedule II
B. Schedule III
C. Schedule IV
D. Schedule V

78. What is the key feature that distinguishes a Schedule II controlled substance from a Schedule I controlled substance under the CSA?

A. Schedule II drugs have a lower potential for abuse than Schedule III drugs
B. Schedule II drugs have a currently accepted medical use in the United States
C. Schedule II drugs may be sold without a prescription in limited quantities
D. Schedule II drugs are exempt from DEA registration requirements

79. Under the CSA, a prescription for a Schedule III or IV controlled substance may be refilled a maximum of how many times, and within what period after the issue date?

A. 5 refills within 6 months
B. 6 refills within 12 months
C. 5 refills within 12 months
D. 3 refills within 6 months

80. A patient presents a diazepam prescription that was issued 7 months ago and still shows 2 refills remaining on the label. What does federal law permit the pharmacy to do?

A. Dispense both remaining refills because they were authorized by the prescriber
B. Dispense only one more refill and cancel the rest
C. Refuse the refill because the prescription expired 6 months after issuance
D. Transfer the refills to another pharmacy for dispensing

81. Two pharmacies that do not share an electronic database want to transfer a Schedule IV prescription with remaining refills. How many times does federal law allow the original prescription information to be transferred for refill purposes?

A. Unlimited times, as long as refills remain
B. One time only
C. Twice, if the prescriber approves each transfer
D. Transfers of controlled substance prescriptions are prohibited

82. Two pharmacies in the same chain electronically share a real-time, online database. How does this affect transfers of Schedule III-V prescription refill information between them under federal law?

A. Transfers remain limited to one time only
B. Transfers are prohibited between commonly owned pharmacies
C. Each transfer requires a new hard-copy prescription
D. They may transfer the prescription up to the maximum refills permitted by law and the prescriber's authorization

83. A pharmacist can supply only 40 of the 90 oxycodone tablets written on a valid Schedule II prescription because of a stock shortage. Under federal law, within what period must the remaining tablets be dispensed?

A. Within 72 hours of the first partial filling
B. Within 7 days of the first partial filling
C. Within 30 days of the first partial filling
D. Within 6 months of the issue date

84. When a patient voluntarily requests a partial fill of a Schedule II prescription (and state law does not prohibit it), federal law requires any remaining portions to be filled no later than what deadline?

A. 72 hours after the first partial fill
B. 6 months after the date the prescription was written
C. 30 days after the date the prescription was written
D. 14 days after the first partial fill

85. A hospice pharmacy receives a Schedule II morphine prescription dated June 1 for a patient with a documented terminal illness, and the pharmacist annotates it 'terminally ill.' Under federal law, this prescription may be partially filled in individual dosage units for how long?

A. Up to 6 months from the issue date
B. Up to 60 days from the issue date, unless the medication is discontinued sooner
C. Up to 30 days from the issue date with no exceptions
D. Up to 72 hours from the first partial fill

86. A pharmacy needs to order hydromorphone tablets from its wholesaler. Which DEA form (or its electronic equivalent) must be used for this order?

A. DEA Form 224
B. DEA Form 222
C. DEA Form 106
D. DEA Form 41

87. Which DEA form does a new retail pharmacy submit to register to dispense controlled substances, and how often must that registration be renewed?

A. DEA Form 224, renewed every 3 years
B. DEA Form 222, renewed every 2 years
C. DEA Form 363, renewed every year
D. DEA Form 225, renewed every 3 years

88. A pharmacy technician opening the store discovers a break-in overnight, and a significant quantity of oxycodone is missing. What does federal law require the pharmacy to do?

A. File DEA Form 41 within 30 days and notify the state board
B. Notify DEA only if the loss exceeds 100 dosage units
C. Complete DEA Form 222 to document the missing stock
D. Notify the local DEA Field Division Office in writing within one business day and file DEA Form 106 within 45 days of discovery

89. DEA Form 41 is used by a registrant to document which activity?

A. Ordering Schedule I and II controlled substances
B. Reporting theft or significant loss of controlled substances
C. Recording controlled substances that have been destroyed
D. Applying for a new DEA registration

90. Which of the following pharmacy activities requires a DEA Form 222 or its electronic equivalent?

A. Obtaining amphetamine salts (Schedule II) stock from a distributor
B. Dispensing a Schedule II prescription to a patient
C. Returning expired Schedule IV inventory to a reverse distributor
D. Renewing the pharmacy's DEA registration

Answer Key

1. C - Lipitor is the brand name for atorvastatin, an HMG-CoA reductase inhibitor (statin) used to lower cholesterol and reduce cardiovascular risk. Rosuvastatin (Crestor), simvastatin (Zocor), and pravastatin (Pravachol) are other statins in the same class but are marketed under different brand names.

2. A - Metformin is the only biguanide in common use and is the usual first-line oral agent for type 2 diabetes. Sulfonylureas such as glipizide work by stimulating insulin release, a different mechanism, so they are a separate class.

3. D - A dry, nonproductive cough is a well-known class effect of ACE inhibitors such as lisinopril and typically resolves after the drug is stopped. Angiotensin II receptor blockers (ARBs) like losartan act on the same pathway but are far less likely to cause cough, which is why they are often used as a substitute.

4. B - Synthroid is a brand of levothyroxine, a synthetic T4 thyroid hormone used to treat hypothyroidism. Methimazole and propylthiouracil are antithyroid drugs used for the opposite problem (hyperthyroidism), and liothyronine is synthetic T3, a different thyroid hormone product.

5. C - Amlodipine is a calcium channel blocker indicated for high blood pressure and for certain types of angina (chest pain). It relaxes and widens blood vessels rather than treating ulcers or thyroid disease, so those indications belong to entirely different drug classes.

6. B - Metoprolol is a beta blocker, specifically a beta-1 selective (cardioselective) agent, used for hypertension, angina, heart failure, and after a heart attack. Generic names ending in -olol are a useful clue for beta blockers, distinguishing them from calcium channel blockers such as amlodipine.

7. A - Peripheral edema (swelling of the lower legs, ankles, and feet) is one of the most common side effects of amlodipine and other dihydropyridine calcium channel blockers. A dry cough points instead to ACE inhibitors, and a slow heart rate is more typical of beta blockers.

8. D - Prilosec is the brand name for omeprazole, a proton pump inhibitor used for GERD and ulcers. Famotidine is an H2 blocker (a different acid-reducing class), and pantoprazole (Protonix) is a different PPI sold under its own brand name.

9. B - Omeprazole and pantoprazole are proton pump inhibitors (PPIs), which block the stomach's acid-producing pump to reduce acid secretion. H2 receptor antagonists such as famotidine also lower acid but through a different receptor, and antacids simply neutralize acid already present.

10. C - Cozaar is the brand name for losartan, an angiotensin II receptor blocker (ARB) used for high blood pressure. Valsartan, candesartan, and olmesartan are also ARBs, but each is marketed under its own separate brand name.

11. A - Losartan is an angiotensin II receptor blocker (ARB); generic names ending in -sartan reliably signal this class. ARBs block the action of angiotensin II at its receptor, whereas ACE inhibitors (names ending in -pril) block the enzyme that forms angiotensin II, so the two act at different points in the same pathway.

12. D - Albuterol is a short-acting beta2-agonist that rapidly relaxes airway smooth muscle, making it the classic rescue inhaler for acute bronchospasm. Inhaled corticosteroids and leukotriene antagonists are controller medicines that reduce inflammation over time and do not relieve an attack quickly.

13. A - Fine tremor, nervousness, and a fast heartbeat are common side effects of albuterol because beta2-agonist stimulation spills over to affect skeletal muscle and the heart. A slow heart rate is the opposite of what albuterol causes and is instead typical of beta blockers.

14. B - Neurontin is the brand name for gabapentin, an anticonvulsant also widely used for nerve pain. Pregabalin (Lyrica) is a closely related drug and is frequently confused with gabapentin, but it is a distinct product with its own brand name.

15. D - Gabapentin is FDA-approved to relieve postherpetic neuralgia, the nerve pain that can persist after a shingles outbreak, and as adjunctive therapy for partial seizures. Fibromyalgia is an approved indication for the related drug pregabalin, not for gabapentin, so it is a common distractor.

16. C - Sertraline is a selective serotonin reuptake inhibitor (SSRI) used for depression, OCD, panic disorder, PTSD, and other conditions. SNRIs such as duloxetine act on both serotonin and norepinephrine, so they form a separate, related class.

17. D - Sumatriptan is a triptan, a selective serotonin (5-HT) receptor agonist that constricts dilated cranial blood vessels to abort a migraine already in progress. Beta blockers such as propranolol are used to prevent migraines rather than to treat an acute attack, which is a key distinction.

18. A - Duloxetine is a serotonin-norepinephrine reuptake inhibitor (SNRI), and its dual action helps explain its use for both mood disorders and certain pain conditions such as diabetic peripheral neuropathy and fibromyalgia. An SSRI raises serotonin only, which is why SSRIs are not first-line for these pain indications.

19. B - Hydrochlorothiazide is the prototype thiazide diuretic, commonly used for high blood pressure and mild edema. Furosemide is a loop diuretic that produces a stronger, faster diuresis, so the two are not interchangeable in class.

20. C - Lasix is the brand name for furosemide, a loop diuretic used to treat edema and high blood pressure. Bumetanide and torsemide are other loop diuretics, while spironolactone is a potassium-sparing diuretic that works by a different mechanism.

21. C - The NDC reads labeler code first, product code second, and package code third. Reversing the last two segments is a common error: the product code sits in the middle and describes the drug itself, while the package code always comes last and describes the container.

22. A - The FDA assigns the first segment, the labeler code, to any firm that manufactures, repacks, relabels, or distributes the drug under its own name. The product and package codes are assigned by the firm itself, so options naming those segments are incorrect.

23. D - The product code identifies a specific strength, dosage form, and formulation for a particular firm. Package size and type belong to the third segment, and lot numbers and expiration dates are never part of the NDC at all.

24. B - The package code, the final segment, identifies package sizes and types, so two container sizes of the identical product carry different package codes. The labeler and product codes stay the same because the firm, drug, strength, dosage form, and formulation are unchanged.

25. C - The FDA assigns 10-digit NDCs only in 4-4-2, 5-3-2, or 5-4-1 configurations. The 5-4-2 pattern totals 11 digits; it is the padded billing format created by inserting a leading zero, which makes it a tempting but incorrect choice here.

26. A - BUDs are calculated from the date or time of compounding, marking when the preparation may no longer be stored or transported. The dispensing date is irrelevant to the calculation, which is why counting from pickup is the classic wrong answer.

27. B - Nonpreserved aqueous preparations carry the shortest limit, 14 days, because water supports microbial growth and there is no preservative to suppress it. The 35-day limit applies only when the aqueous preparation contains a preservative.

28. D - Preserved aqueous preparations may be assigned a BUD of up to 35 days under USP <795>. The 90-day and 180-day limits apply to nonaqueous and solid dosage forms respectively, not to a water-based suspension, and 14 days is the stricter limit reserved for nonpreserved aqueous preparations.

29. C - USP <797> states a conventionally manufactured multiple-dose vial may not be used more than 28 days after first puncture unless the manufacturer specifies otherwise. Relying on the printed expiration date is wrong because that date only applies while the vial remains unpunctured.

30. B - Expiration dates reflect the time period during which the product is known to remain stable when stored as labeled, supported by stability testing submitted to the FDA. Drugs do not automatically become poisonous at expiration; the concern is loss of strength and possible degradation products, so the toxicity option overstates it.

31. D - Once mixed with water, amoxicillin suspension should be discarded after 14 days. The stock bottle's expiration date no longer applies after reconstitution because the added water starts chemical degradation, which is why that distractor is wrong.

32. A - FDA guidance states insulin vials and cartridges, opened or unopened, may be left unrefrigerated at 59°F to 86°F for up to 28 days and continue to work. The 14-day figure is a common mix-up with reconstituted antibiotic suspensions, not insulin.

33. C - LASA stands for look-alike/sound-alike. ISMP publishes the List of Confused Drug Names, made up of name pairs that have actually been confused in errors reported to its national reporting programs. Confusion can happen in handwriting, on computer selection screens, or in spoken orders.

34. A - HydrOXYzine and the blood pressure medication hydrALAZINE are a documented pair on ISMP's confused drug names list. Tall man letters capitalize the differing middle letters to help staff tell them apart. A mix-up can cause unexpected sedation or leave hypertension untreated.

35. D - ISMP lists including the purpose of the medication on prescriptions among its strategies for preventing confusion between look-alike and sound-alike names. TraZODone and traMADol are a documented LASA pair. An indication such as insomnia points staff toward the sedating antidepressant instead of the opioid analgesic.

36. B - CeleXA (citalopram), CeleBREX (celecoxib), and Cerebyx (fosphenytoin) form a well-known confusion group on the ISMP List of Confused Drug Names. An antidepressant, an anti-inflammatory, and an anticonvulsant could each plausibly be dosed at 20 mg daily. Verifying with the prescriber is the only safe way to resolve an illegible name in this group.

37. B - NovoLIN 70/30 and NovoLOG Mix 70/30 appear as a confused name pair on the ISMP list, along with NovoLOG versus NovoLIN and HumaLOG versus HumuLIN. The names and percentages look nearly identical at a glance, but the products contain different insulins with different onset times. Separating storage and flagging the names helps prevent a wrong-insulin selection.

38. D - ZyPREXA, an antipsychotic, and ZyrTEC, an antihistamine, are a documented pair on the ISMP confused drug names list. Dispensing the antipsychotic to an allergy patient, or the reverse, has serious clinical consequences. ZyPREXA is also listed as confused with CeleXA and Zestril.

39. A - MetFORMIN and metroNIDAZOLE are a documented ISMP LASA pair with matching 500 mg strengths, which makes shelf mix-ups easy. The PTCE content outline lists barcode usage among core error prevention strategies. A barcode scan compares the NDC of the product actually in hand against the drug entered on the order, catching the error before verification.

40. C - BusPIRone, an anxiolytic, and buPROPion, an antidepressant and smoking cessation aid, are a documented LASA pair. Both the FDA and ISMP recommend tall man lettering to emphasize the differing letters. The other options are not listed as confused with busPIRone.

41. D - GlipiZIDE and glyBURIDE are a documented confused name pair, and oral hypoglycemic agents appear as a class on the ISMP List of High-Alert Medications in Community/Ambulatory Healthcare. A mix-up risks serious hypoglycemia because the two sulfonylureas differ in potency and duration. The other pairs are LASA drugs but are not both community high-alert agents.

42. A - The ISMP list pairs OxyCONTIN with oxytocin, MS Contin, oxyCODONE, oxyBUTYnin, and oxyMORphone. MS Contin (morphine) and OxyCONTIN (oxycodone) are both long-acting opioids whose names share the Contin suffix. Confusing any of these products can cause severe patient harm.

43. B - Tall man lettering uses uppercase letters, starting from the left side of the name, to highlight the parts of similar drug names that differ. The FDA notes it can be combined with bolding or color to further draw attention. It alerts staff that a name can be confused with another product.

44. C - The FDA list pairs predniSONE with prednisoLONE, capitalizing the endings where the two names differ. The uppercase SONE versus LONE distinction is the key visual cue. The two corticosteroids have different potencies, so a mix-up is clinically significant.

45. A - The FDA started its Name Differentiation Project in 2001 to evaluate postmarketing reports of name pair confusion. When tall man lettering is deemed appropriate, the agency asks the manufacturer to voluntarily revise labels and labeling, then updates its published list. FDA may also consider labeling revisions and safety communications.

46. D - The CD3 methodology works from the left, capitalizing to the right once two or more dissimilar letters appear, then works from the right to return two or more shared letters to lowercase. When no common letters exist on the right side, only the central part of the word is capitalized. ISMP uses this tested rule to standardize its recommendations.

47. C - The FDA Name Differentiation Project lists CISplatin and CARBOplatin, capitalizing the differing left-side letters. Dosing confusion between these chemotherapy agents has caused fatal overdoses, since carboplatin doses are numerically much larger than cisplatin doses. Correct tall man rendering on shelf labels reinforces the difference.

48. B - ISMP notes that studies between 2000 and 2021 generally support tall man letters for improving name perception, while some studies found conflicting or negative results, partly due to methodological limits. ISMP is participating in FDA-funded research at Northwestern University to clarify the effect. Meanwhile it considers the technique simple and worth using alongside other safeguards, not as a standalone fix.

49. D - ISMP defines high-alert medications as drugs that bear a heightened risk of causing significant patient harm when used in error. Mistakes with these drugs are not necessarily more common, but the consequences of an error are clearly more devastating. That is why they warrant special safeguards.

50. A - Neuromuscular blocking agents are on the acute care high-alert list because accidental administration to a patient who is not mechanically ventilated causes paralysis and death. The list also includes classes such as insulin, opioids, antithrombotics, and concentrated electrolytes. PPIs, statins, and topical antifungals are not high-alert classes.

51. C - ISMP added tranexamic acid injection to the specific medications section of the 2024 acute care list. Vials are often confused with look-alike anesthetic vials stored in surgical areas, and accidental neuraxial injection is a potent neurotoxin with roughly 50 percent mortality. Naloxone, tolvaptan, and alprostadil were suggested by survey respondents but were not added.

52. B - All subcutaneous and IV insulin is treated as a high-alert class, but U-500 insulin receives special emphasis on the list. Its five-fold concentration makes dosing mix-ups especially dangerous, and 100 percent of practitioners in ISMP's 2023 survey considered it high-alert. The other insulins are covered by the general class listing.

53. A - ISMP published this close call in January 2024: look-alike B. Braun bags of heparin and potassium chloride concentrate were stocked in the same cabinet bin. Both are high-alert medications, and infusing concentrated potassium is potentially fatal. The barcode scan prior to administration was the redundancy that intercepted the error.

54. C - PO means by mouth and BID means twice daily, so the patient takes one capsule by mouth two times each day. The Roman numeral i indicates one capsule per dose, and the course length of 10 days comes directly from the sig.

55. A - AC comes from the Latin ante cibum and means before meals. It is commonly seen on medications such as sulfonylureas or rapid-acting insulins that work best when taken shortly before eating, while PC (post cibum) is the abbreviation for after meals.

56. B - OS designates the left eye, gtt means drop, and BID means twice daily. OD would indicate the right eye and OU each eye, while the ear abbreviations use A (AD, AS, AU), so confusing these letters would send the drug to the wrong site.

57. D - SL means sublingual, or under the tongue, and PRN means as needed (when required). Nitroglycerin is placed under the tongue for rapid absorption during an angina episode rather than being swallowed on a schedule.

58. B - HS stands for hora somni, meaning at bedtime, and is common on sedating medications and some cholesterol-lowering drugs. Because handwritten HS can also be misread as half-strength, many safety organizations recommend spelling out the intended timing.

59. A - The Roman numeral ii equals two, gtt means drops, and AU designates each (both) ears. AD would be the right ear only and AS the left ear, while the O abbreviations (OD, OS, OU) refer to the eyes, not the ears.

60. C - AC means before meals, which accounts for three doses with three daily meals, and HS adds one more dose at bedtime. Three mealtime tablets plus one bedtime tablet equals four tablets per day, which is why this sig is often entered as QID scheduling in the pharmacy system.

61. D - QID (quater in die) means four times a day. QD means daily, QOD means every other day, and Q4H means every 4 hours, which would actually produce six doses across a full 24-hour period rather than four.

62. A - ISMP lists q.o.d./QOD as error-prone because a poorly written 'o' can make it look like q.d. (daily) or q.i.d. (four times daily), causing a dangerous frequency error. The recommended practice is to write out 'every other day' instead of using the abbreviation.

63. B - The apothecary abbreviation ss means one-half, so the patient takes half of a 10 mg tablet (5 mg) each dose. QAM indicates the dose is taken every morning, not in the evening (QPM) or on alternating days.

64. C - The patient takes 1 tablet x 2 doses per day = 2 tablets daily. Dividing the quantity by daily use gives 60 tablets / 2 tablets per day = 30 days supply.

65. D - Daily use is 2 tablets x 2 doses = 4 tablets per day. The days supply is 120 tablets / 4 tablets per day = 30 days.

66. A - The patient uses 5 mL x 3 doses = 15 mL per day. Dividing the dispensed volume by daily use gives 150 mL / 15 mL per day = 10 days supply.

67. B - A 10 mL vial at 100 units/mL contains 10 x 100 = 1,000 units. At 35 units per day, 1,000 / 35 = 28.6, which is rounded down to a 28 day supply because a partial day cannot be billed.

68. C - Each 3 mL pen holds 3 x 100 = 300 units, so the box contains 5 x 300 = 1,500 units. The patient injects 25 + 25 = 50 units per day, and 1,500 / 50 = 30 days supply.

69. A - The bottle holds 5 mL x 20 drops/mL = 100 drops. Because OU means each eye, daily use is 1 drop x 2 eyes x 2 doses = 4 drops per day, and 100 / 4 = 25 days supply.

70. D - Daily use is 2 puffs x 4 doses = 8 puffs per day. Dividing the canister total by daily use gives 200 puffs / 8 puffs per day = 25 days supply.

71. B - At 40 mg daily the patient needs 4 tablets x 3 days = 12 tablets, at 20 mg daily 2 tablets x 3 days = 6 tablets, and at 10 mg daily 1 tablet x 3 days = 3 tablets. The total is 12 + 6 + 3 = 21 tablets over a 9 day supply.

72. C - Daily use is 15 mL x 2 doses = 30 mL per day. The days supply is 240 mL / 30 mL per day = 8 days.

73. A - DAW 1 indicates that substitution is not allowed by the prescriber, which is the correct code when the prescriber demands the brand product. DAW 0 means no product selection was indicated, and DAW 2 applies when the patient, not the prescriber, requests the brand.

74. A - Schedule I substances, such as heroin and LSD, are defined by a high potential for abuse and no currently accepted medical use in the United States, so they may not be prescribed or dispensed. Schedules II through V all contain drugs with some accepted medical use, with abuse potential decreasing as the schedule number increases.

75. C - DEA classifies ketamine and anabolic steroids, including testosterone, as Schedule III substances, which have a moderate to low potential for physical and psychological dependence. Their abuse potential is lower than Schedule I and II drugs but higher than Schedule IV drugs.

76. B - Tramadol (Ultram) is federally classified as a Schedule IV controlled substance, the category for drugs with a low potential for abuse and a low risk of dependence. It shares this schedule with drugs such as alprazolam, diazepam, and zolpidem.

77. D - Schedule V consists of preparations containing limited quantities of certain narcotics, including cough preparations with less than 200 milligrams of codeine per 100 milliliters, such as Robitussin AC type products. Schedule V represents the lowest abuse potential of the five schedules.

78. B - Both Schedule I and Schedule II substances have a high potential for abuse, but Schedule II drugs, such as oxycodone, fentanyl, and methylphenidate, have a currently accepted medical use and therefore can be prescribed. Schedule I substances have no accepted medical use and cannot be dispensed for medical treatment.

79. A - Under 21 CFR 1306.22, a Schedule III or IV prescription may be refilled no more than 5 times, and no fill or refill may occur more than 6 months after the date of issue. After 5 refills or 6 months, whichever comes first, a new prescription is required.

80. C - Diazepam is a Schedule IV substance, and 21 CFR 1306.22 prohibits filling or refilling a Schedule III or IV prescription more than 6 months after its issue date, regardless of refills remaining. The patient must obtain a new prescription from the prescriber.

81. B - Under 21 CFR 1306.25, the transfer of original prescription information for a Schedule III, IV, or V controlled substance for refill dispensing is permitted on a one-time basis only. The transfer must also be communicated directly between two licensed pharmacists.

82. D - 21 CFR 1306.25(a) creates an exception to the one-time transfer limit: pharmacies electronically sharing a real-time, online database may transfer a Schedule III-V prescription up to the maximum number of refills permitted by law and the prescriber's authorization. All documentation requirements for transfers still apply.

83. A - When a pharmacist is unable to supply the full quantity of a Schedule II prescription, 21 CFR 1306.13(a) allows a partial fill with the remainder dispensed within 72 hours of the first partial filling. If the balance cannot be supplied within 72 hours, the pharmacist must notify the prescriber, and no further quantity may be dispensed without a new prescription.

84. C - Under 21 CFR 1306.13(b), a Schedule II prescription may be partially filled at the request of the patient or prescriber if state law permits, and remaining portions must be filled no later than 30 days after the date the prescription was written. The total quantity dispensed across all partial fills may not exceed the total quantity prescribed, and for emergency oral prescriptions the limit is 72 hours instead.

85. B - Under 21 CFR 1306.13(c), Schedule II prescriptions for patients in a long-term care facility or with a medical diagnosis documenting a terminal illness may be filled in partial quantities, and the prescription is valid for up to 60 days from the issue date unless terminated earlier by discontinuance of the medication. The pharmacist must record 'terminally ill' or 'LTCF patient' on the prescription, and each partial fill must be documented.

86. B - Under 21 CFR 1305.03, a DEA Form 222 or its electronic CSOS equivalent is required for each distribution of a Schedule I or II controlled substance, which includes a pharmacy ordering hydromorphone from a distributor. Schedule III-V substances may be ordered with ordinary invoices instead.

87. A - Under 21 CFR 1301.13(e), a retail pharmacy registers to dispense Schedule II-V controlled substances using DEA Form 224, and the registration period is 3 years. Renewal is completed with DEA Form 224a; Form 225 is for manufacturers and distributors and Form 363 is for narcotic treatment programs.

88. D - Under 21 CFR 1301.76(b), a registrant must notify the DEA Field Division Office in writing within one business day of discovering a theft or significant loss of controlled substances, and must then file a complete and accurate DEA Form 106 through DEA's secure network application within 45 days of discovery. Form 41 documents destruction, not theft.

89. C - DEA Form 41, the Registrant Record of Controlled Substances Destroyed, documents the destruction of controlled substances rendered non-retrievable. Two authorized employees must witness the destruction and sign the form, and it must be kept as a record for at least two years rather than routinely submitted to DEA.

90. A - A DEA Form 222 or CSOS electronic order is required for each distribution of Schedule I or II controlled substances between registrants, such as a pharmacy acquiring Schedule II stock from a distributor. Dispensing to a patient pursuant to a prescription is not a distribution, Schedule III-V transfers do not require the form, and registration renewal uses DEA Form 224a.