11.7 Adverse reactions, interactions and safe-medication principles

Name: _____ Class: _____ Date: _____ **Total: 24 marks**

KEY WORDS enzyme induction • enzyme inhibition

Objective

Classify harm; time the interactions; name the backstop.

1 Key knowledge and worked examples

■ Two kinds of harm

Type A dose-related and predictable (β-blocker bradycardia); type B idiosyncratic – allergy, rare toxicity ✓.

■ Worked example: two clocks

Induction (rifampicin, phenytoin): new enzyme – days on, days off, effect outlasts the course ✓. Inhibition (clarithromycin, grapefruit CYP3A4): occupies existing enzyme – rises from the first dose ✓.

2 Practice

2.1 Define type A vs type B in one line each. [3]

2.2 Which is faster: induction or inhibition? [3]

2.3 Name the five rights. [3]

3 Exam-style questions

3.1 A fictional patient stabilised on warfarin twice has medicines added: first a CYP inhibitor, later an inducer.

Predict the INR each time (rises; falls) and time course (inhibitor fast – first doses; inducer slow – days to build enzyme and days to fade) ✓. State where the interaction surfaces (the INR measurement) and what monitoring change follows ✓. [8]

3.2 A fictional near-miss: the right drug at tenfold the intended amount was caught at the bedside.

Classify what would have happened (type A – dose-related, predictable) and why the near-miss chain is behavioural, not pharmacological ✓. Explain the role of the five rights and of population reporting (UK MHRA Yellow Card; US FDA MedWatch) for type B detection ✓ (WHO patient-safety fact sheet, 2023). [7]

Solutions

2.1

- Type A: dose-related, predictable. Type B: idiosyncratic ✓.

2.2

- Inhibition – occupies existing enzyme at the first dose; induction must build ✓.

2.3

- Right patient, drug, dose, route, time ✓.

3.1

- Inhibitor: warfarin cleared slower → INR rises, within the first co-doses ✓.
- Inducer: clearance faster → INR falls, over days ✓.
- The surface: the INR reading itself ✓.
- Response: shorten monitoring intervals while the pair run together; recheck after any change ✓.

3.2

- Tenfold dose = type A in the making – dose-related and predictable ✓.
- The near-miss chain is behavioural: prescribing-dispensing-administration ✓.
- Five rights intercept at the bedside before harm ✓.
- Type B needs population eyes – Yellow Card (UK), MedWatch (US) ✓.

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