Q14 What is an adverse drug reaction? Classify (with drug examples) the different types (March 2012)

Adverse drug reaction

- Any undesirable effect of a drug beyond its anticipated therapeutic effects occurring during normal clinical use
- Covers harmful and unintended effects resulting not only from the use of a drug at normal doses for an approved indication, but also from administration errors and non-approved indications.

May be classified as type A or B:

TYPE A REACTION → reactions which are predictable based on the known pharmacologic properties of a drug. Make up the majority of drug reactions (~90%). Subtypes:

- **Side effects** → undesired effects related to known actions of the drug (eg, nausea/vomiting with opioids, somnolence with clonidine)
- **Secondary effects** → undesired effects not directly related to drug mechanism (eg, diarrhoea post antibiotics)
- **Overdose** → eg, unintentional overdose of paracetamol causing hepatic impairment, opioid overdose causing decreased LOC and respiratory impairment
- **Drug interactions** → eg, an increase in the effects of warfarin in conjunction with erythromycin
- **Administration errors** → reaction due to drug given in inappropriate dose or manner (eg, hypotension caused by bolusing amiodarone in a non-ALS situation)

TYPE B REACTION → rarer and more unpredictable. Not expected from the known pharmacological properties of the drug. Subtypes:

- **Intolerance** → low threshold to the known pharmacological side effects of a drug, eg, tinnitus after a small dose of aspirin.

- **Idiosyncrasy** → pharmacogenetic variability may exist in drug metabolism (plasma cholinesterase variants who metabolism Ach abnormally slowly), inability to compensate for drug effects (G6PD deficiency, acute porphyrias eg, triggered by barbiturates), and in drug effects themselves (eg, malignant hyperthermia triggered by exposure to volatile anaesthetic agents)

- **Allergy or anaphylaxis** → anaphylactic reactions are acute Type 1 hypersensitivity reactions that occur on second or subsequent exposure to a drug, mediated by IgE and mast cells. Anaphylactoid reactions, which are characterised by mast cell degranulation without IgE involvement, may be responsible for reactions to first exposure of a drug (eg, rocuronium, latex allergy, chlorhexidine). Delayed-type hypersensitivity reactions may also occur.