D1: Pharmaceutical Products

- Define Drugs and Medicines and their effects on physiological and psychological health and well-being.
- Discuss the Placebo Effect
- Outline stages in research, development and testing of new pharmaceutical products.
  - You need to know the testing phases in much more detail (see my PowerPoint)
  - LD<sub>50</sub> – what it is and its significance in drug testing.
- Six methods of administering drugs as outlined in the alternative text.
  - Discuss advantages and disadvantages to using each method (i.e. when would you use method over another)
- Define and calculate a therapeutic index (therapeutic window) of a drug
  - Compare a high therapeutic window to a low therapeutic window
- Define tolerance and explain why tolerance increases the risk of a drug overdose
- Define side effects
  - Discuss contraindication and how benefits and side effects of therapy are taken into account when deciding on the best course of action for an individual
    - Specifically discuss benefits and side effects of aspirin and morphine and when these said side effects might actually be beneficial (think of reducing the risk of blood-clotting (aspirin) in addition to its analgesic effect and morphine’s additional effect of inducing constipation).
- Define and discuss physical and psychological dependence.

D2: Antacids

- Discuss the effects of excess acidity in the stomach on one’s health
- Explain how antacids work to relieve indigestion
  - Action of alginates and dimethicone
- Know common antacids and their action
  - Write balanced equations for NaHCO<sub>3</sub>, Mg(OH)<sub>2</sub>, and Al(OH)<sub>3</sub>
  - Use molar ratio (stoichiometry-yay!!!) to determine the relative effectiveness of these antacids.
  - Why is NaOH(or other similar bases) not used an antacid?
- Identify side effects of antacids

D3: Analgesics

- Review how and why we perceive pain (i.e. what’s happening in our body so we feel pain?)
• Explain how mild analgesics work to relieve pain.
  o Give some examples
• Explain how strong analgesics (opiates) work to relieve pain.
  o Give some examples
  o How are these different from depressants in their action?
• Describe the uses of derivatives of salicylic acid.
• Compare the advantages and disadvantages of using aspirin and paracetamol (acetaminophen)
  o When would you use one over the other?
• Compare the structures of morphine, codeine, and heroin (diamorphine)
  o You will have their structures in the data booklet. Be able to identify common functional groups, and identify differing functional groups related to their different activities.
• Discuss short and long term advantages and disadvantages to using morphine and its derivatives (morphine, codeine, heroin and Demerol).
  o Aka. Opiates, narcotics or narcotic analgesics
  o Discuss social consequences of dependence as well (i.e. theft and prostitution)
  o Chemical reaction to make heroin from morphine – of course DON’T ever do this, it is very illegal and unsafe!
  o Discuss the prime medical uses, pharmacological effects, psychological effects, tolerance and dependence of opiates.

D4: Depressants

• Describe the effects of depressants
  o Tranquilizers
  o Sedatives
  o Hypnotics
  o Realize that the effects are a continuum, dependent upon dose and potency. There is a good chart on page 415 of the alternative text highlighting this idea.
• Discuss the social and physiological effects of ethanol.
  o Short and long term
• Describe the synergistic effects of ethanol with other drugs, specifically:
  o With sedatives, with aspirin, with cocaine and with benzodiapenes
• Describe and explain 5 techniques used for detection of ethanol in breath, blood and urine. I highly recommending watching the Richard Thornley video on this assessment statement (D.4.3)
  o 1. Breathalyzer test
    ▪ Write out the redox equations
    ▪ Identify the color change of the acidified dichromate in this test
  o 2,3. Blood and Urine tests using Gas Liquid Chromatography (G.L.C.)
  o 4. Intoximeter-Infrared absorption
  o 5. Intoximeter-Fuel Cell
  o Be sure to compare advantages and limitations of each method
- Identify other commonly used depressants and describe their structure
  - Diazepam (Valium)
  - Nitrazepam (Mogadon)
  - Fluoxetine hydrochloride (Prozac)

**D5: Stimulants**

- List physiological effects of stimulants
  - *Note that increased alertness and improved mood are psychological not physiological*
- Compare amphetamines and adrenaline (epinephrine)
  - Structures
  - Effects
  - Use as treatments
- Know the meaning of the term sympathomimetic drug when relating to adrenaline and amphetamines
- Discuss short- and long-term effects of nicotine consumption
- Describe the effects of caffeine
- Compare the structure of caffeine with nicotine
  - *focus on tertiary amines!*