**Extended Response 2**

**Musculoskeletal System Total 30 Marks**

Part 2: In-Class Assessment

* You will have 20 minutes to complete this task under exam conditions.
* 5 minutes will be allowed for reading and planning.

1. Osteoporosis and osteoarthritis are both degenerative bone diseases that can be associated with aging.
   1. Distinguish between osteoporosis and osteoarthritis. (2 Marks)

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| --- | --- | --- |
| Osteoarthritis | Loss/wearing away of cartilage at joints | 1 |
| Osteoporosis | Loss of calcium, bone density/weakening of bones | 1 |
|  |  | /2 |

1. Osteoporosis is more common among women than men. In Australia, 5.5% of women compared to 1.2% of men, have osteoporosis.
   1. Describe, in terms of bone structure, how osteoporosis develops and explain why women are more likely to be affected by osteoporosis than men. (10 Marks)

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| Bones lose minerals  Bone breakdown/resorption occurs faster than new bone formation  Bone density decreases  Bones become more porous and fragile | 1-4 |
| Sex hormones oestrogen and testosterone help maintain bone formation | 1 |
| Men develop greater bone density than females during development | 1 |
| Oestrogen levels decrease rapidly during menopause which results in rapid increase in bone loss | 1-2 |
| Testosterone gradually decreases over time with age therefore increase in bone loss is gradual over time | 1-2 |
|  | /10 |

* 1. List **three** risk factors for increased likelihood of being affected by osteoporosis and how it is diagnosed in Australia. (4 Marks)

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| Any of the following risk factors:   * Low calcium intake * Low vitamin D levels * Low hormone levels/women – early menopause/men low testosterone * Low levels of physical activity * Smoking * Excessive alcohol intake * High intake of corticosteroids | 1-3 |
| Any of the following:   * Bone density scan * Dual-energy absorptiometry (DXA) scan | 1 |
|  | /4 |

* 1. Describe **one** form of treatment and any associated risks or side effects.

(3 Marks)

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| Treatment should:   * include safe exercise program – including modified strength training and safe weight bearing * fall prevention – including exercise to improve balance, trip-proof home, wearing hip protector, wearing sturdy footwear * diet/supplements rich in calcium and vitamin D | 2 |
| Any one of the following medication treatments with associated risks:   * bisphosphonate – most commonly used for initial treatment, tablets taken to help reduce bone breakdown.   + May cause stomach upset, ulcers and rarely cancer, pain in bones and joints and can cause jawbone decay/osteonecrosis (rarely) * Denosumab – 6 monthly injection works differently to bisphosphonate but has same results   + Numbness/tingling in fingers, muscle cramps/aches, seizures, skin infection/itchy dry skin, back muscle or bone pain, joint pain of knees, hips and spine, high cholesterol, stomach pain/nausea * Strontium renalate – sachet dissolved in water absorbed in similar to calcium. Helps increase bone formation and decrease bone loss. For treatment of severe established osteoporosis   + Increased risk of cardiovascular disease, seizure, loss of consciousness, very rare life-threatening rashes toxic epidermal necrolysis (TEN), Stevens-Johnsons syndrome (SIS) and severe hypersensitivity reactions (DRESS) * Selective oestrogen modulators (SERMs) – SERMs mimic oestrogen to help reduce rate of bone loss   + Potential side effects include hot flushes and a slightly increased risk of deep vein thrombosis * Hormone replacement therapy (HRT)/testosterone therapy – artificial supplementation of sex hormones to reduce rate of bone loss   + Breakthrough bleeding, breast tenderness, bloating, nausea. Small chance of increased risk of cardiovascular disease/stroke/DVT/ endometrial cancer * Parathyroid hormone – daily injections of PTH, regulates the amount of calcium, phosphorus and magnesium. Helps increase bone density. For severe cases of osteoporosis.   + Nausea, leg cramps, dizziness |  |

1. In 2007-08 an estimated 7.6% of all Australians (1.6 Million people) had osteoarthritis.
   1. Describe the common symptoms of osteoarthritis and provide the main causes of osteoarthritis. (4 Marks)

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| **Common symptoms**  Pain and stiffness in joints | 2 |
| **Common causes**  Previous joint injuries, overweight, occupation requiring repetitive use of joints | 2 |
|  | /4 |

* 1. Describe the process of diagnosis for osteoarthritis and the most common treatment. (7Marks)

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| **Diagnosis** formed through presence of symptoms and physical examination | 2 |
| Plus at least one of the following:  x-ray may show narrowing/disfiguring of joint but are not conclusive  blood test used to rule out other forms of arthritis | 1 |
| **Treatment** usually includes:   * A form of pain relief such as paracetamol * Non-steroidal inti-inflammatory drugs (NSAIDS) * Gentle exercise program * Weigt-loss program if cause is from being overweight * Joint replacement surgery if no other treatments are effective for pain management | 1-4 |
|  | /7 |