UNIVERSITY MEDICINE • EXERCISE SHEET

# 10.4 Neoplasia

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

**KEY WORDS** neoplasia • metastasis

## Objective

Separate grade from stage; trace the metastatic cascade.

## 1 Key knowledge and worked examples

■ **Benign vs malignant**

Benign: differentiated, slow, capsulated, local. Malignant: atypia, invasion, METASTASIS – the defining property ✓. Cascade: detach (E-cadherin lost) → MMPs degrade BM → intravasate → survive (few of 10,000) → extravasate → colonise.

■ **Worked example: two axes**

GRADE = appearance (Gleason 2–10); STAGE = extent (TNM: T1–T4, N0–N3, M0/M1) ✓. Routes: lymphatic (carcinoma), blood (sarcoma, kidney, liver), transcoelomic (ovary).

## 2 Practice

**2.1** What single property defines malignancy? [3]

**2.2** Grade vs stage – define each in one clause. [3]

**2.3** Which route do sarcomas favour? [3]

## 3 Exam-style questions

**3.1** A fictional report reads: poorly differentiated; invades muscle; 3 of 12 nodes positive; no distant deposits.

Extract the grade cue (poorly differentiated) and the TNM reading (muscle invasion raises T; N1 for nodes; M0) ✓. Explain why prognosis follows stage first (reach beats look) and which finding would change management most (a new M1 deposit) ✓. [8]

**3.2** A fictional teaching calculation: a tumour sheds ~$10^6$ cells/day into the circulation; few of 10,000 survive to colonise.

Explain why circulating cells ≠ metastases (six low-probability gates: detach, degrade, intravasate, survive, exit, colonise – seed AND soil) ✓. Predict first destinations for breast carcinoma (axillary nodes, lymphatic) vs osteosarcoma (lung, haematogenous) ✓. [7]