PIPADOR REVISION

MRCOG Part 1 Revision Notes

Carcinogens

PATHOLOGY • LECTURE 337

VISUAL EXAMINATION REVISION NOTES

2026 Edition

337

MRCOG PART 1 REVISION NOTES | PATHOLOGY

Carcinogens

Classification, mechanisms, multistep carcinogenesis and carcinogens relevant to gynaecological cancers

IARC Group 1	HPV	Smoking	Oestrogen
Carcinogenic to humans	Cause of virtually all cervical cancer	Cervix, vulva, bladder, lung	Endometrium, breast

■ KEY FACTS: Learning objectives

- Define carcinogens and classify them (chemical, physical, biological, hormonal).
- Describe mechanisms and multistep carcinogenesis.
- Describe carcinogens relevant to gynaecological cancers and prevention.

337.1 Classes

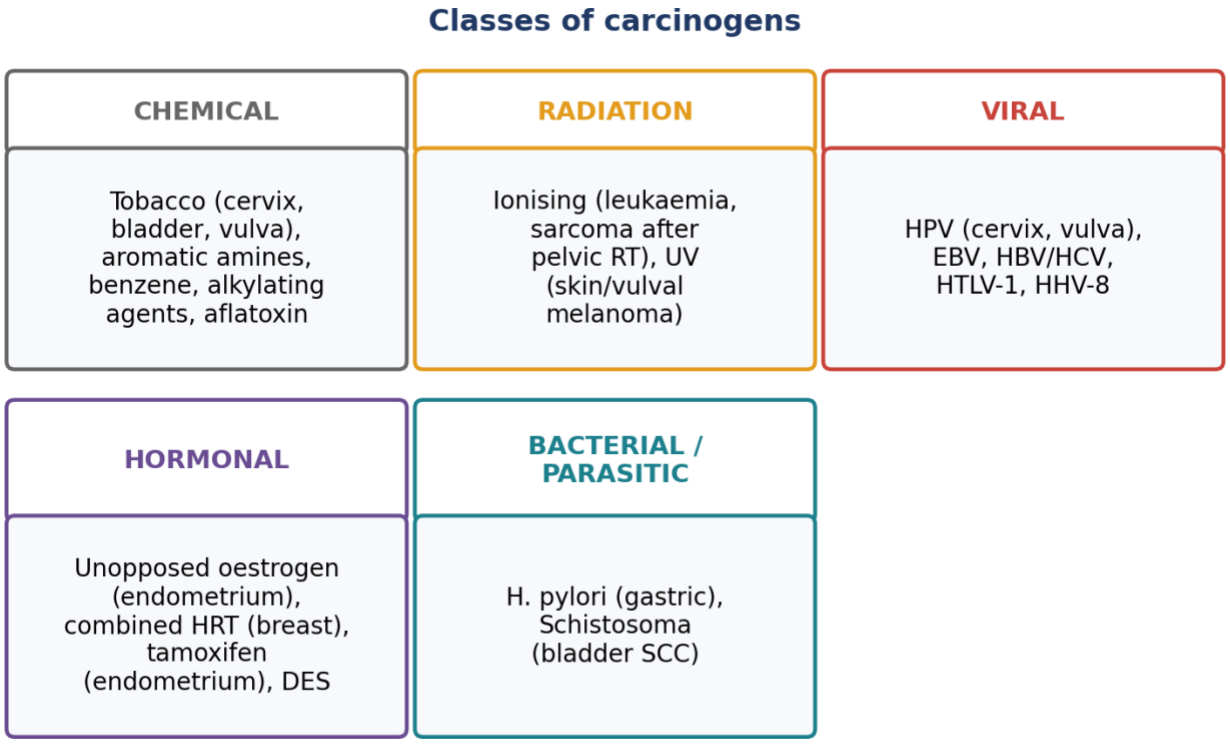


Figure 337.1 — Classes of carcinogens

- **IARC classification**: Group 1 (carcinogenic — tobacco, HPV, alcohol, combined oestrogen–progestogen HRT and contraceptives, tamoxifen for endometrium, ionising radiation), 2A (probably), 2B (possibly), 3 (not classifiable).
- **Genotoxic** carcinogens damage DNA directly (or after metabolic activation by CYP450 — e.g. benzo[a]pyrene)
  - **Non-genotoxic** act as promoters (hormones, inflammation).

337.2 Carcinogenesis

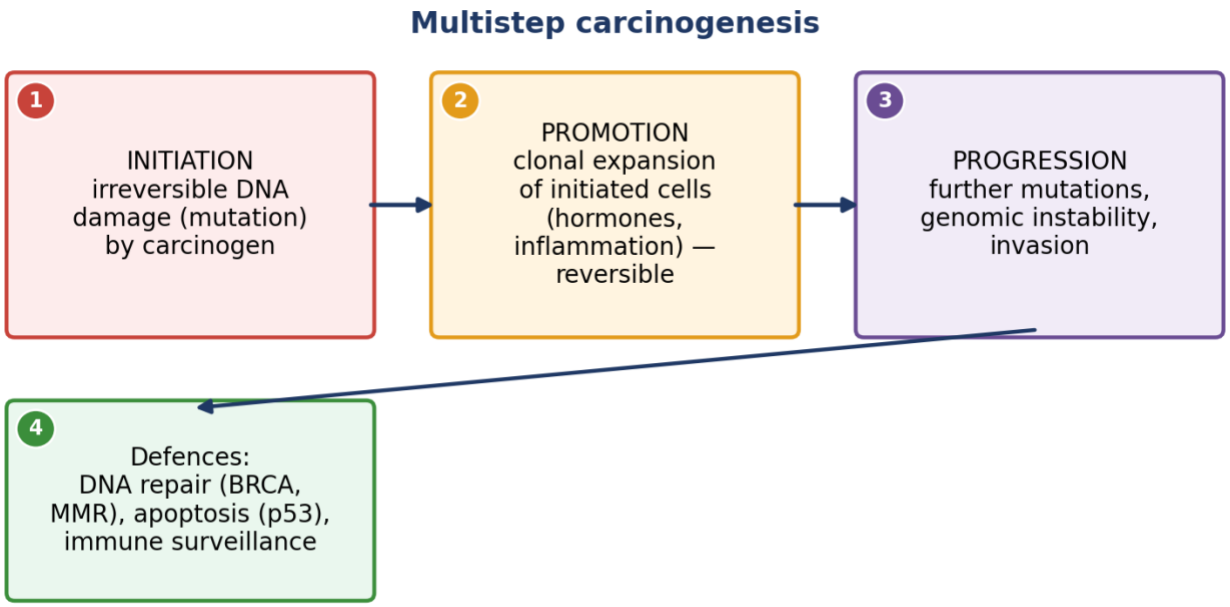


Figure 337.2 — Initiation, promotion, progression

337.3 Gynaecological examples

Cancer	Carcinogens / risk factors	Prevention
Cervix	• High-risk **HPV** • Smoking (nicotine metabolites in cervical mucus) • Immunosuppression • Long-term COC (modest)	HPV vaccination, screening, smoking cessation
Endometrium	Unopposed oestrogen (obesity, PCOS, HRT without progestogen), tamoxifen, Lynch syndrome	Weight loss, progestogen protection (LNG-IUS), COC use (protective)
Ovary	Ovulation ('incessant ovulation'), BRCA, Lynch, endometriosis (clear cell/endometrioid), talc (possible), HRT (small)	COC (↓ ≈ 50% after long use), risk-reducing salpingo-oophorectomy, salpingectomy
Vulva	HPV (younger), lichen sclerosus (older, HPV-independent), smoking	Treat lichen sclerosus, vaccination
Breast	Oestrogen exposure, combined HRT, alcohol, radiation, BRCA	Breastfeeding, exercise, risk-reducing surgery/chemoprevention
Secondary malignancy	Alkylating chemotherapy (AML), pelvic radiotherapy (sarcoma, bladder, rectal)	Long-term follow-up

337.4 Must-know summary

■ EXAM TIP

- Carcinogens: chemical, radiation, viral (HPV, EBV, HBV), hormonal, microbial.
- Initiation (DNA damage) → promotion (proliferation) → progression.
- HPV → cervix/vulva; unopposed oestrogen & tamoxifen → endometrium; smoking → cervix/vulva/bladder.
- COC protects ovary and endometrium; HPV vaccine prevents cervical cancer.

■ MNEMONIC / MEMORY AID

'Initiate, Promote, Progress' — the carcinogenesis IPP.