PIPADOR REVISION

MRCOG Part 1 Revision Notes

Pre-eclampsia

PATHOLOGY • LECTURE 330

VISUAL EXAMINATION REVISION NOTES

2026 Edition

330

MRCOG PART 1 REVISION NOTES | PATHOLOGY

Pre-eclampsia

Pathophysiology, placental and organ pathology, diagnosis, prediction and prevention

≈ 2–4%	Stage 1	sFlt-1 ↑ PlGF ↓	Aspirin
Of pregnancies	Abnormal placentation	Anti-angiogenic imbalance	From 12 wk in high-risk women

■ KEY FACTS: Learning objectives

- Describe the pathophysiology of pre-eclampsia (two-stage model).
- Describe the pathology in the placenta, kidney, liver, brain and coagulation system.
- Relate pathology to diagnosis (NICE NG133), prediction (PlGF) and prevention.

330.1 Pathophysiology

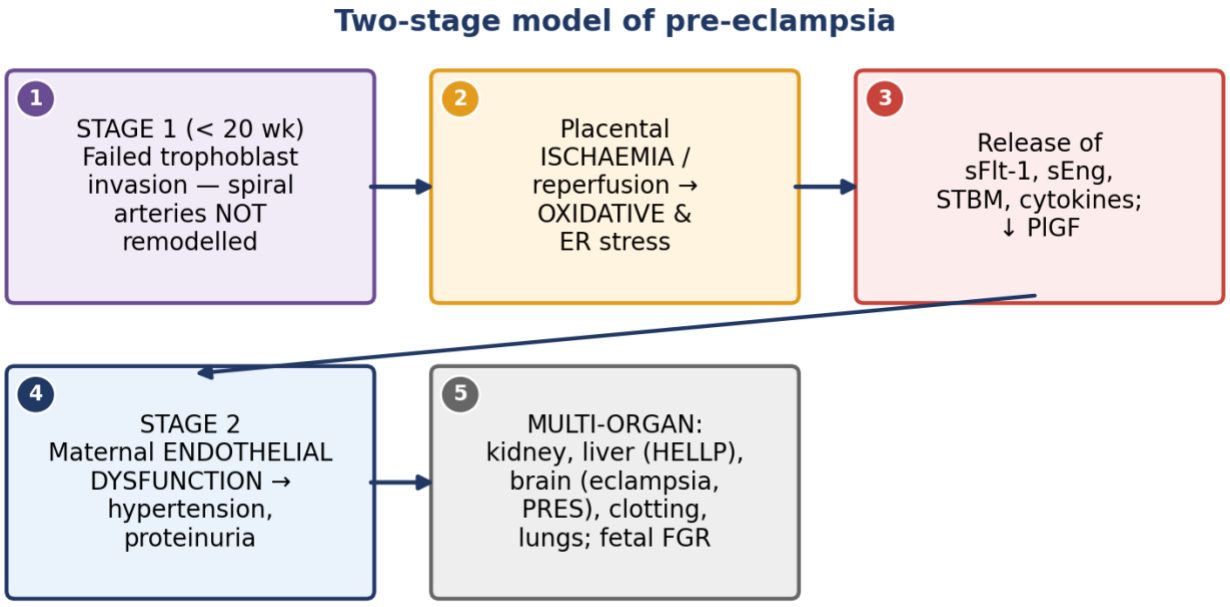


Figure 330.1 — Two-stage model

- **Stage 1**: extravillous trophoblast fails to remodel spiral arteries (immune maladaptation — uNK/KIR–HLA-C, ↓ Tregs) → narrow, vasoactive vessels, intermittent perfusion.
- **Stage 2**: stressed syncytiotrophoblast releases **sFlt-1** (binds VEGF/PlGF) and **soluble endoglin** (blocks TGF-β)
  - Syncytiotrophoblast microvesicles and cytokines → systemic **endothelial dysfunction**, ↓ NO/PGI_2, ↑ ET-1, AT1-AA
  - Loss of Ang II refractoriness.
- Maternal susceptibility (chronic hypertension, renal disease, diabetes, obesity, APS, SLE) can produce late-onset disease with milder placental lesions.

330.2 Organ pathology

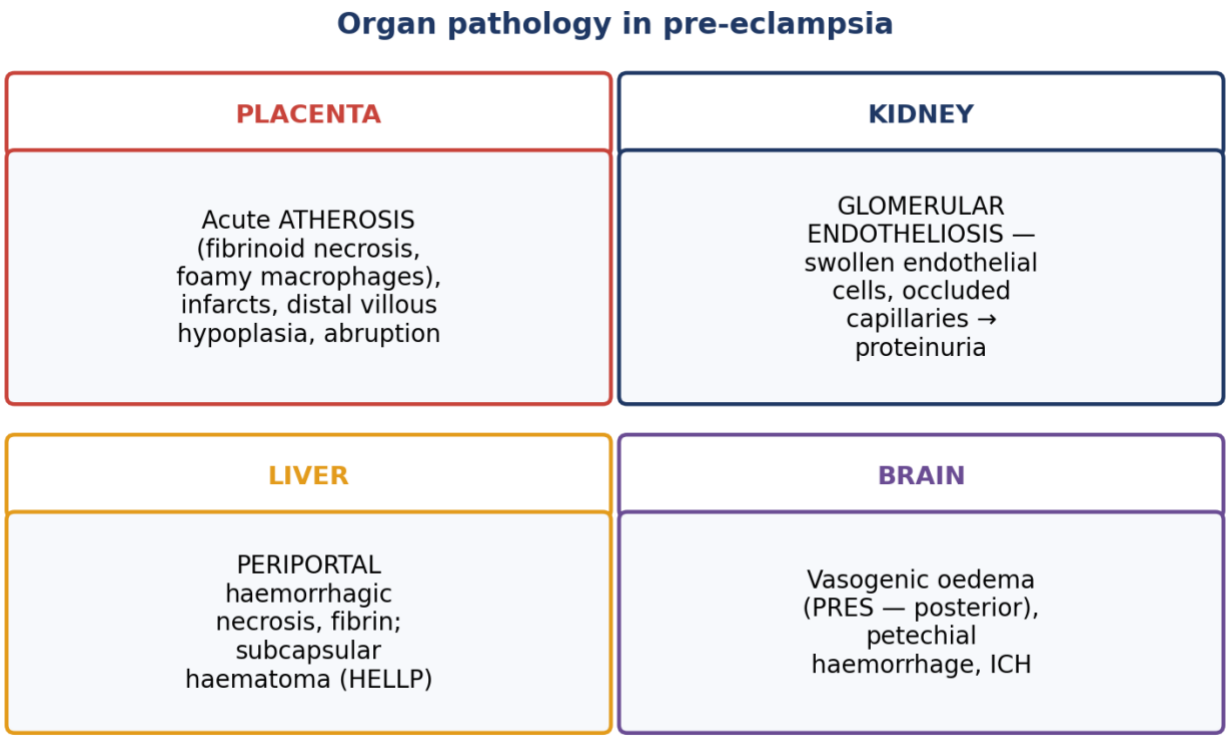


Figure 330.2 — Organ pathology

System	Effect
Haematological	Thrombocytopenia, microangiopathic haemolysis, DIC (HELLP)
Lungs	Pulmonary oedema (capillary leak, low oncotic pressure)
Fetus	FGR, oligohydramnios, abruption, stillbirth

330.3 Clinical correlation (NICE NG133)

- Diagnosis: new hypertension ≥ 140/90 after 20 weeks + proteinuria (PCR ≥ 30 mg/mmol) **or** other maternal organ dysfunction or uteroplacental dysfunction (FGR).
- **PlGF-based testing** (20–36+6 weeks) helps rule out pre-eclampsia (NICE DG49).
- Prevention: **aspirin 75–150 mg** from 12 weeks for women with 1 high-risk or ≥ 2 moderate-risk factors.
- Severe features: BP ≥ 160/110
  - Headache/visual disturbance, epigastric pain, clonus, platelets < 100
  - Rising creatinine/ALT → $MgSO_4$, antihypertensives, timing of birth.

330.4 Must-know summary

■ EXAM TIP

- Stage 1 failed spiral artery remodelling → stage 2 endothelial dysfunction (sFlt-1 ↑, PlGF ↓, sEng ↑).
- Placenta: acute atherosis, infarcts; kidney: glomerular endotheliosis; liver: periportal necrosis; brain: PRES.
- Diagnosis NG133; PlGF testing; aspirin from 12 weeks for high risk.

■ MNEMONIC / MEMORY AID

Pre-eclampsia — 'Poor Placenta → Poisoned Endothelium'.