PIPADOR REVISION

MRCOG Part 1 Revision Notes

DiGeorge Syndrome (22q11.2 Deletion)

CELL BIOLOGY • LECTURE 117

VISUAL EXAMINATION REVISION NOTES

2026 Edition

MRCOG Part 1 Revision Notes

Lecture 117: DiGeorge Syndrome (22q11.2 Deletion)

Cell biology • Visual revision edition — expands Lectures 94 and 114

COLOUR CODE USED THROUGHOUT THESE NOTES

DELETION / RISK	CARDIAC	THYMUS / PARATHYROID	PSYCHIATRIC / GENETICS	PREGNANCY / CARE

LEARNING OBJECTIVES — tick off as you go

- ☐ Explain the genetics (LCR22, TBX1) and the embryological basis.
- ☐ Describe the CATCH-22 features, especially the cardiac phenotype.
- ☐ Plan antenatal detection, counselling and differentials.
- ☐ Outline neonatal and lifelong management.
- ☐ Manage pregnancy in a woman who has 22q11.2 deletion.

1 Genetics and Embryology

IN ONE LINE: *Commonest microdeletion (~1 in 4000): ~3 Mb lost between LCR22-A and -D, taking TBX1 with it. Pharyngeal pouches 3 and 4 and cardiac neural crest fail → thymus, parathyroids, outflow tract.*

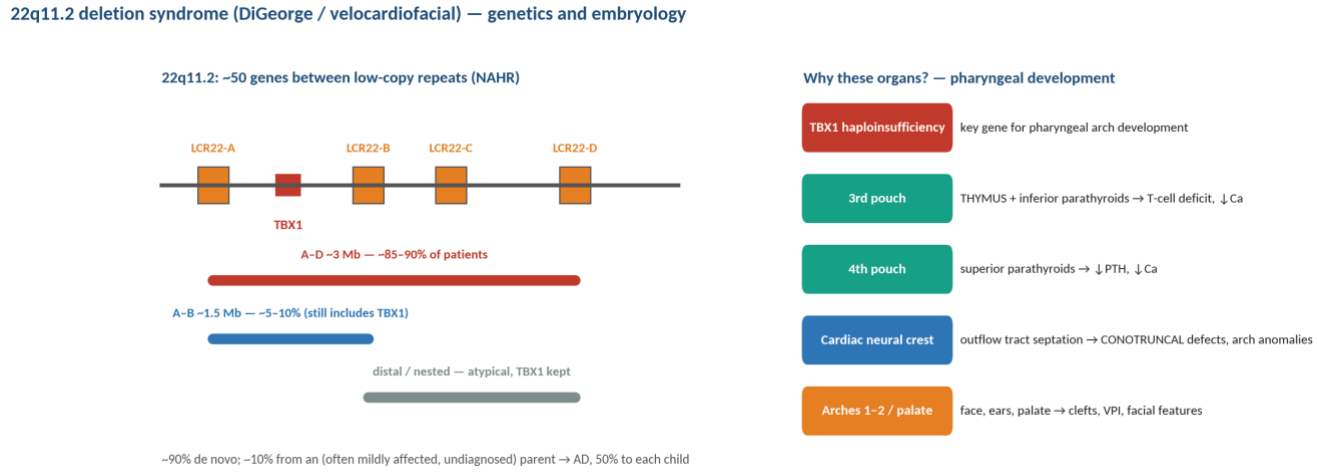


Figure 1. LCR22 deletions and pharyngeal development.

2 Clinical Features

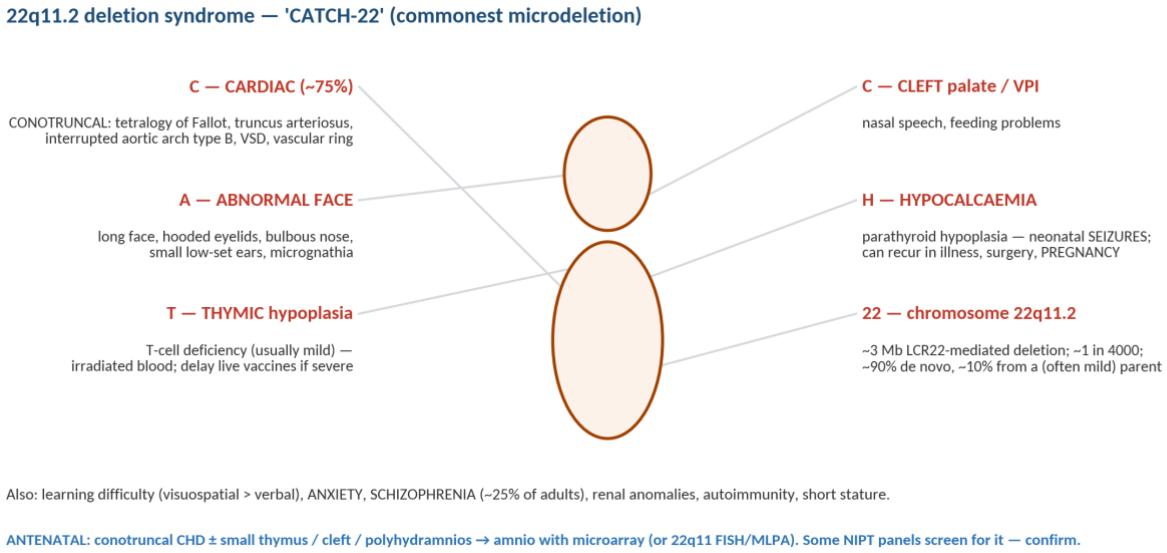


Figure 2. CATCH-22 (from Lecture 114).

MNEMONIC / MEMORY HOOK

'CATCH-22' — Cardiac, Abnormal face, Thymic hypoplasia, Cleft palate, Hypocalcaemia, chromosome 22. Add: renal (~30%), low platelets, learning, psychiatric.

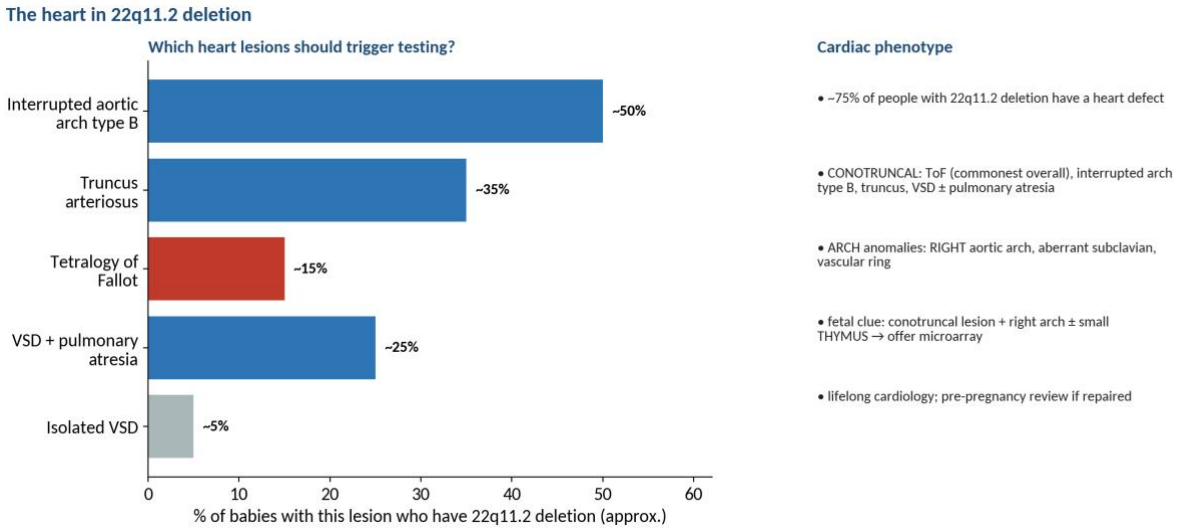


Figure 3. Cardiac lesions.

System	Key points
Immunity	Spectrum from normal to rare complete athymia (thymus transplant); ↓ T cells, B cells normal; autoimmunity ~10% (cytopenias, thyroid, arthritis)
Calcium	~50–60% hypocalcaemia — neonatal seizures; LATENT hypoparathyroidism unmasked by illness, surgery, puberty, PREGNANCY
Palate / speech	Overt or submucous cleft; velopharyngeal insufficiency → nasal speech, feeding problems
Learning / psych	Mean IQ ~70; visuospatial > verbal; ADHD, autism, anxiety; SCHIZOPHRENIA ~25% of adults

System	Key points
Other	Renal anomalies, hearing loss, short stature, hypothyroidism, thrombocytopenia (large platelets), scoliosis

3 Antenatal Detection

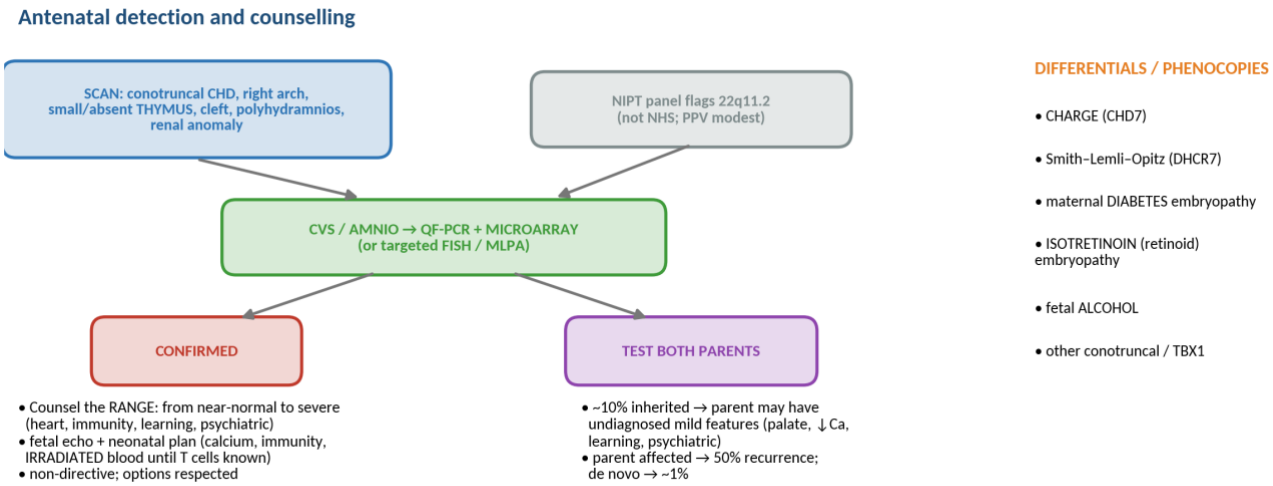


Figure 4. Antenatal pathway and differentials.

4 Management and Pregnancy

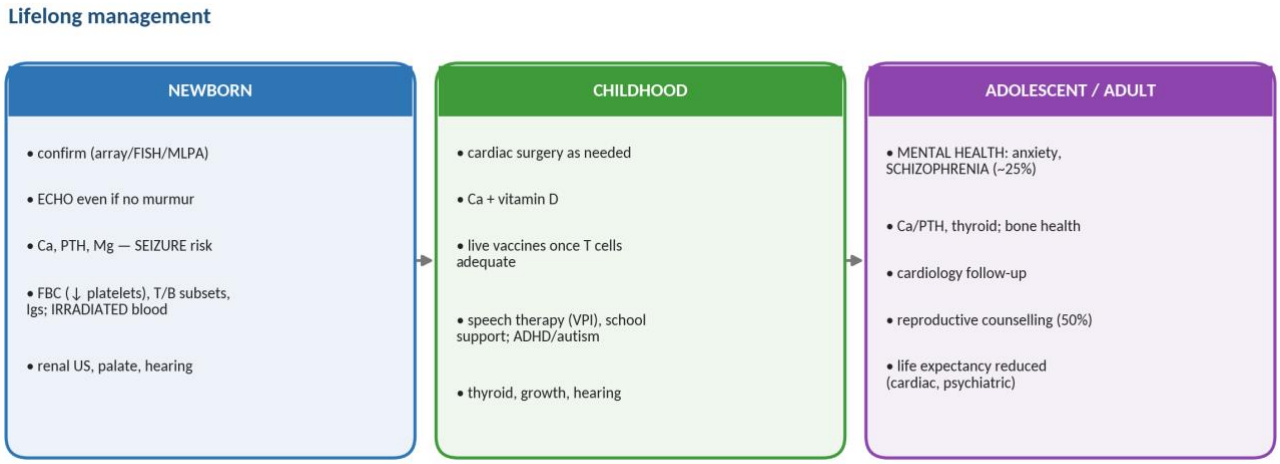


Figure 5. Lifelong management.

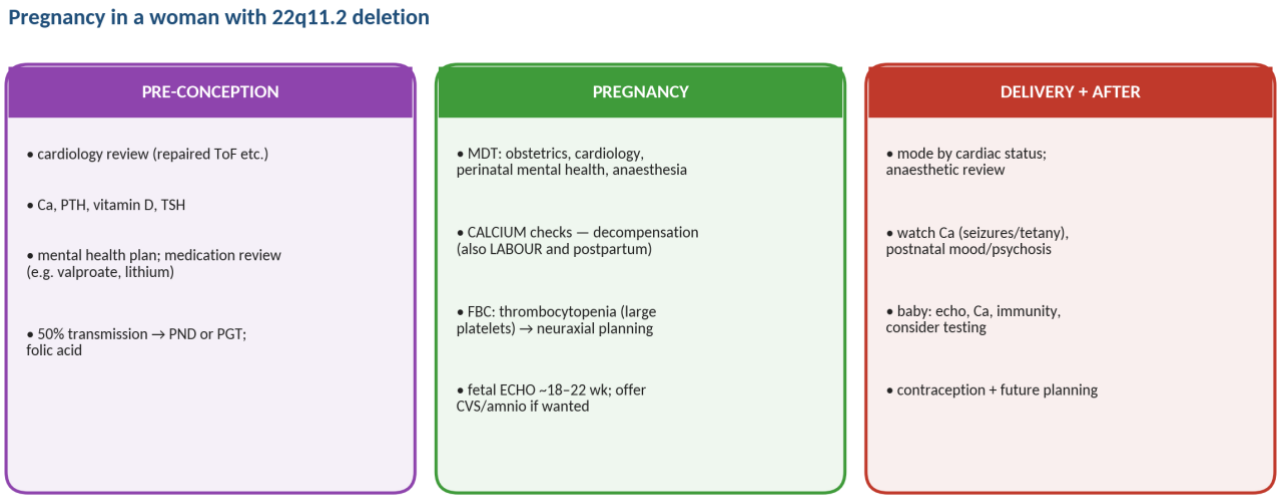


Figure 6. Pregnancy in an affected woman.

- **22q11.2 duplication** (reciprocal): milder, variable, often inherited — relevant for family planning in any 22q11 family.

★ PEARL

Fetal interrupted arch type B (~50%), truncus (~35%) or ToF (~15%) → microarray. Neonatal hypocalcaemic seizure → think 22q11.2: echo, Ca/PTH, immunity, irradiated blood.

Affected mother: cardiac + calcium + platelets + mental health; 50% to each child; fetal echo.

5 MRCOG Exam Pearls — Last-Minute Page

Numbers to know

~1 in 4000 Incidence	**~3 Mb** Typical deletion (LCR22 A–D)	**~90%** De novo	**~75%** Heart defects
~50% IAA type B with 22q11.2	**~15%** ToF with 22q11.2	**~25%** Adult schizophrenia	**50%** Risk to children

HIGH-YIELD CHECKLIST

- ☐ NAHR between LCR22; ~3 Mb A–D; TBX1.
- ☐ 3rd/4th pouches → thymus, parathyroids; neural crest → outflow tract.
- ☐ CATCH-22; heart ~75% conotruncal.
- ☐ Test: microarray, FISH (TUPLE1), MLPA.
- ☐ Fetal conotruncal CHD, right arch, small thymus → test.
- ☐ Differentials: CHARGE, SLO, diabetes, isotretinoin, alcohol.
- ☐ Newborn: echo, Ca/PTH, immunity, irradiated blood, renal US.
- ☐ Live vaccines once T cells adequate.
- ☐ Adult: schizophrenia ~25%; Ca, thyroid, bone.
- ☐ Pregnancy: cardiac, Ca, platelets, mental health, 50%, fetal echo.

Self-assessment — cover the right-hand column

Question	Answer
Key gene in 22q11.2 deletion?	TBX1
Mechanism?	NAHR between LCR22 repeats
Pouches affected?	3rd and 4th pharyngeal pouches
Lesion most strongly linked (~50%)?	Interrupted aortic arch type B
Neonatal blood product precaution?	Irradiated blood until T-cell status known
Why check calcium in pregnancy?	Latent hypoparathyroidism can decompensate
Platelet issue relevant to anaesthesia?	Thrombocytopenia (large platelets)
Adult psychiatric risk?	Schizophrenia ~25%
Drug causing a DiGeorge-like embryopathy?	Isotretinoin (retinoids)
Risk to child of an affected mother?	50%

6 References

- Óskarsdóttir S et al. Updated clinical practice recommendations for managing children with 22q11.2 deletion syndrome. Genet Med 2023.
- Boot E et al. Updated clinical practice recommendations for managing adults with 22q11.2 deletion syndrome. Genet Med 2023.
- McDonald-McGinn DM et al. 22q11.2 deletion syndrome. Nat Rev Dis Primers 2015.