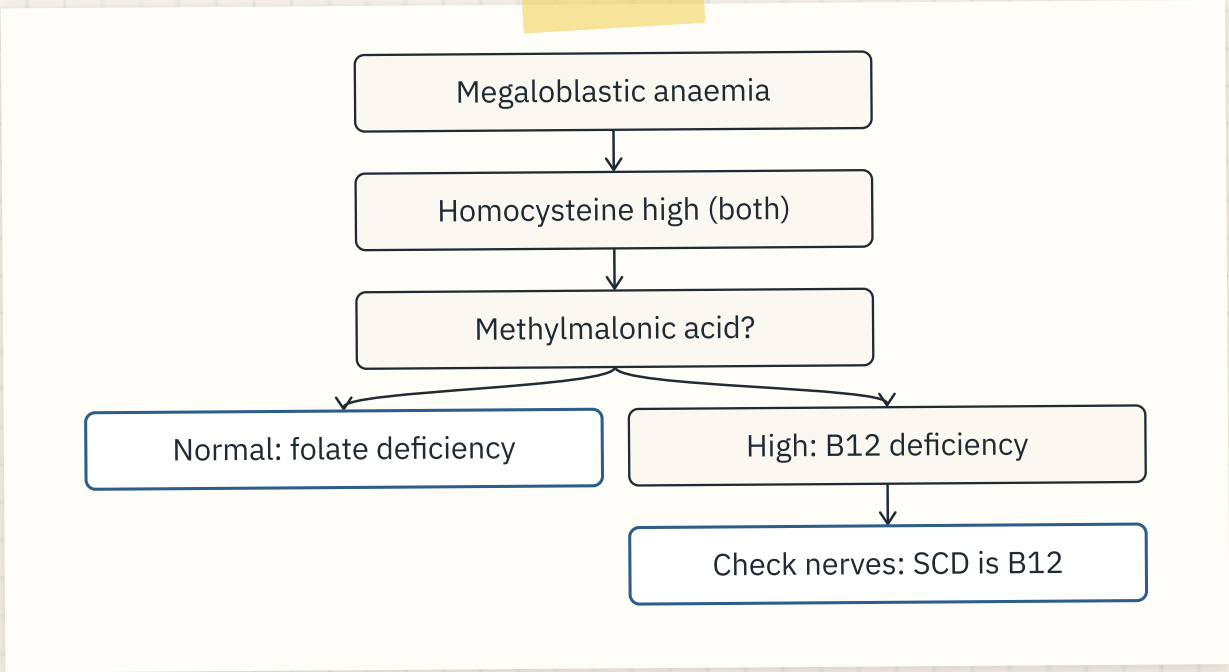
B12 vs folate in 4 points

Separate them with MMA, homocysteine and the nerves



Step by step

1. Both deficiencies stall DNA synthesis (same megaloblastic anaemia) and block methionine synthase (same high homocysteine).
2. Methylmalonic acid rises only in B12 deficiency (mutase needs B12 alone).
3. B12 deficiency also damages nerves: dorsal columns and corticospinal tracts.
4. Serum B12 below 200 pg/mL indicates deficiency (US practice).

	Folate	B12
Megaloblastic anaemia	Yes	Yes
Homocysteine	High	High
Methylmalonic acid	Normal	High
Nerve damage (SCD)	Not a feature	Yes
Stores if intake stops	A few months	3–5 years

Folate vs B12 deficiency

Two enzymes, two vitamins

Methionine synthase: folate + B12, so homocysteine rises in both

Methylmalonyl-CoA mutase: B12 only, so methylmalonic acid rises in B12 only

Exam traps

- Homocysteine is high in both deficiencies, so it cannot tell them apart.
- Hypersegmented neutrophils and macrocytosis occur in both.
- Folic acid can correct the anaemia of B12 deficiency while the nerve damage progresses.
- Subacute combined degeneration is a B12 complication, not a folate one.

B12 vs folate deficiency: MMA, homocysteine and the nerves

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/haematology-oncology/b12-vs-folate-deficiency

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