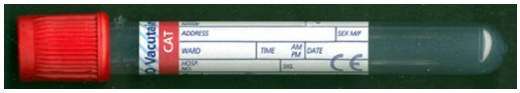
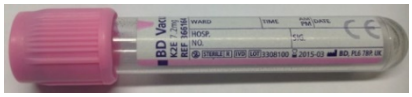
Methylmalonic Acid

Synonyms	MMA, methylmalonate
Clinical Indication	Homocysteine and methylmalonic acid (MMA) are metabolic intermediates that accumulate when a step in the recycling of folate or homocysteine/methionine is blocked. Homocysteine is elevated in both vitamin B12 and folate deficiencies, whereas MMA is only elevated in vitamin B12 deficiency. Methylmalonic Acid analysis is reserved for cases in which initial test results for vitamin B12 and/or folate levels are borderline (near the lower limit of normal), or if clinical findings are discordant with initial B12 result, for example low-normal B12 level in an individual with unexplained macrocytic anaemia or neuropathy.
Part of Profile / See Also	
Request Form	Combined Pathology manual Blood form or ICE request
Availability / Frequency of Analysis	Referred Test: Analysed at Nutristasis Unit, Synnovis (9093) King's College Hospital if specific criteria met.
Turnaround Time	2 weeks
Patient Preparation	None required.
Sample Requirements	
Specimen Type	Serum or EDTA plasma
Volume	2 ml
Container	 Red top (plain) tube or  Yellow top (SST) tube or  Pink/purple/lemon top (EDTA) tube  Paediatric EDTA (Red top – Sarstedt)  Paediatric EDTA (Pink top – BD Microtainer)
Reference Range & Units	Normal male: <280 nmol/L Normal female: <360 nmol/L Levels above the reference range suggest functional vitamin B12 deficiency/insufficiency at the tissue level providing that renal function is not impaired.
Interferences	Renal insufficiency and methylmalonic aciduria can cause increased MMA

	levels. MMA can also be elevated independently of vitamin B12 deficiency in thyroid disease, intestinal bacterial overgrowth or haemoconcentration. Antibiotic treatment can lower MMA.
Interpretation & Clinical Decision Value (if applicable)	If MMA levels are increased and the vitamin B12 level is mildly decreased, then an early or mild B12 deficiency may be present. This may indicate a decrease in available B12 at the tissue level. If MMA level is normal, then it is unlikely that there is a B12 deficiency. For individuals with a borderline/low vitamin B12 and a high MMA, if would be prudent to test for intrinsic factor antibodies to establish if pernicious anaemia is the underlying cause.
References	https://www.synnovis.co.uk/our-tests/methylmalonic-acid https://www.uptodate.com/contents/clinical-manifestations-and-diagnosis-of-vitamin-b12-and-folate-deficiency
Test code	MMA
Lab Handling	Aliquot at least 500ul ASAP and store in referrals rack at 4C. For samples bled on a Friday or prior to a bank holiday, aliquot and store in the frozen referrals rack at -20C. Sent daily by courier to King's College Hospital, London.

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