



**NORTH WEST
MATERNAL
MEDICINE NETWORK**

Lancashire & South Cumbria
Cheshire & Merseyside
Greater Manchester & Eastern Cheshire

**North West Maternal Medicine Network
Regional Referral Pathway
Greater Manchester & Eastern Cheshire**

Background

North West Maternal Medicine Network

North West Maternal Medicine Contacts

Medical Conditions Categories

Cardiac

Lung disease

Gastrointestinal and Liver disease

Diabetes

Endocrine disease

Kidney disease

Rheumatological disease

Neurological disease

Haematological disease

Background

Maternal Medicine Networks (MMN) are central to NHS England's Improvement strategy for reducing mortality for all pregnant women/birthing people and reducing neonatal morbidity and mortality. The aim of MMNs is to ensure women/birthing people with acute and chronic medical problems have timely access to specialist advice and care at all stages of pregnancy. One of the essential actions highlighted in the recently published Ockenden report (2020) was that there must be robust pathways in place for managing complex pregnancies. The network approach to delivering care has been embraced by fetal medicine and many areas of medicine/surgery and is already practiced in an ad-hoc way for medical problems in the maternity population.

The MMN is responsible for ensuring that all women/birthing people in the network's footprint with significant medical problems receive timely specialist care and advice before, during, and after pregnancy. All constituent providers within the network will be responsible for agreeing and upholding shared protocols on the management and referral of women/birthing people with medical conditions, including reviewing guidelines and referral pathways. This model of care will ensure that – where agreed appropriate – investigation and management is carried out by an experienced Multidisciplinary Team (MDT).

The MMN will network all maternity providers through the maternal medicine centres (MMC) by further developing existing care pathways and creating new pathways and clinical guidelines as service provision and expertise develops. Every Trust within the region that provides maternity services (any level) is a member of the NW MMN.

The majority of women/birthing people with complications during pregnancy will continue to be managed by their local maternity service. The proportion of care delivered by a MMC will vary according to individual need. For some, a single visit to the MMC or communication with the MMC by the local unit will suffice. For the most complex cases, it may be recommended that all care is delivered within the MMC.

The purpose of the document is to provide guidance to professionals regarding who to refer to the MMC.

The criteria for referral have been developed using the NHSE [Maternal Medicine Service Specification \(2021\)](#) as guidance, in consultation with Lead Obstetricians and Physicians from across the Network. There have been some amendments to reflect local expertise and capacity.

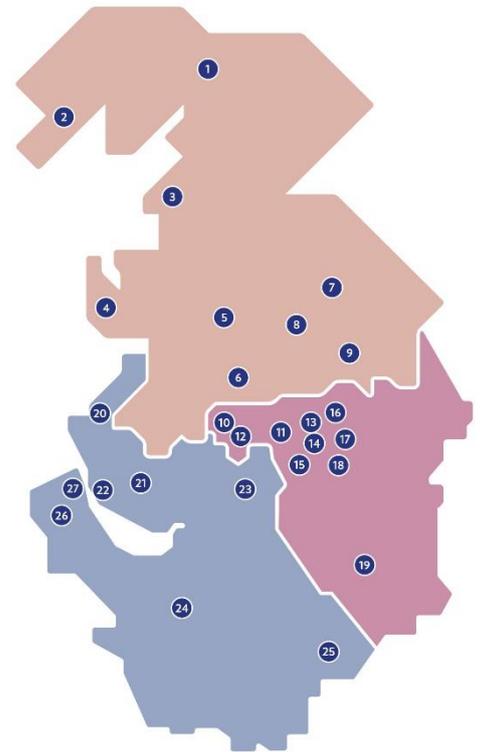
For any conditions that are not included in this document that you require advice for/referral to a MMC please contact your local MMC.

When referring women/birthing people, be respectful and aware of all religions, languages, cultures and diversities to ensure best care for all. Please take into consideration the additional challenges faced by those who are from an ethnic minority, have a severe mental illness or are socially deprived as they are at a higher risk of poor physical health and poor outcomes, compared with the general population. The perinatal period adds further complexity, therefore please ensure you consider mental health needs and refer to your local perinatal mental health service appropriately.

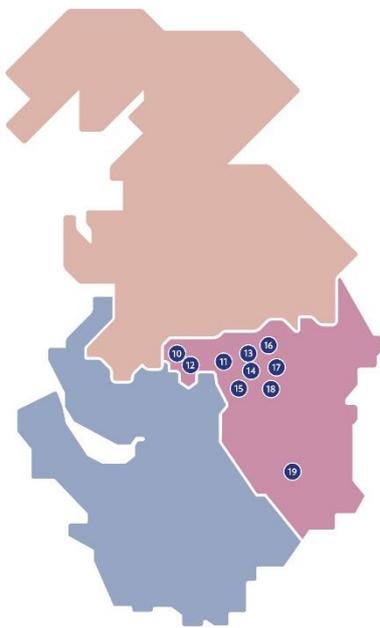
North West Maternal Medicine Network Footprint

The Northwest MMN is made up of three specialist MMCs held within St Mary's Hospital Manchester, Liverpool Women's Hospital and The Royal Preston Hospital alongside services delivered in 19 local Hospitals supporting the population of the Northwest of England.

Providers falling within the Greater Manchester and Eastern Cheshire locality are listed below.



LOCAL MATERNITY & NEONATAL SYSTEMS



Locations

GREATER MANCHESTER & EASTERN CHESHIRE

10	Royal Bolton Hospital	16	Royal Oldham Hospital
11	Ingleside Birth and Community Centre, Oakwood Park		
12	Royal Albert Edward Infirmary, Wigan	17	Tameside General Hospital
13	North Manchester General Hospital, Crumpsall	18	Stepping Hill Hospital, Stockport
14	St Mary's Hospital, Manchester		
15	St Mary's, Wythenshawe	19	Macclesfield District General Hospital

KEY | ● CONSULTANT LED LABOUR WARD ● HOME BIRTH ● ALONGSIDE MIDWIFE-LED UNIT (AMU)¹ ● FREE-STANDING MIDWIFE-LED UNIT (FMU)² ● MATERNAL MEDICINE CENTRE

North West Maternal Medicine Centre Referral Process

All referrals to a MMC can be made through a referral system. This can lead to the following:

- 1) Written response specifying opinion/view of MMC team
- 2) Discussion at MMC MDT with written response to the referring provider
- 3) Review in Specialist clinic
- 4) Transfer of care

GMEC MMC at St Mary's Hospital	
Maternal Medicine MDT meeting	Thursday 13:00-14:00 via Teams
MDT/MMC team	Email: maternal.medicine@mft.nhs.uk
Referral form	https://forms.office.com/e/NKekE9Fu31
EMERGENCY ADVICE	On call Consultant Obstetrician: Switchboard: 0161 2761234 ask for Obstetric Consultant on call Bleep 6000 or via Vocera

Referrals should be made by 13:00 on the preceding Tuesday for listing on that week's MDT, held every Thursday 13:00-14:00 on Teams. Please prepare a short presentation with relevant information.

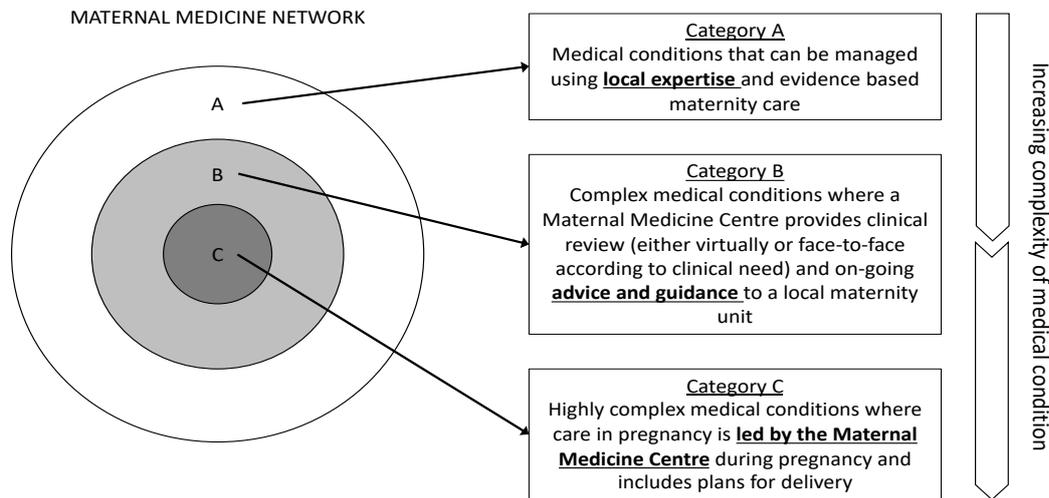
For urgent referrals contact the on call obstetric consultant through switchboard for immediate guidance as per the emergency advice in the above table.

Each MMC is equipped to facilitate and organise telemedicine across the MMN if it is safe for the woman/birthing person. The option to facilitate consultations via telemedicine is available for pregnancies where it is difficult for the woman/birthing person to attend an appointment in person. Telemedicine will also be used where expertise is required for specific cases and clinicians from several providers need to work together as a MDT to implement joint care plans. This mitigates the geographical challenges that occur when experts are not based at the same Trust.

Medical Conditions Categories

The maternal medicine network is made up of:

- Maternal medicine centres (hub)
- Local maternity centres (spoke)



These categories are a guide only. They can be modified according to local expertise and experience. Where local expertise is sufficient, a condition may move from category C to B, or B to A. An example would be epilepsy, where there may be a local joint obstetric epilepsy clinic including a neurologist with expertise in epilepsy in pregnancy, in which case care could remain at a local centre. Where local expertise is insufficient, when a condition progresses or increases in severity during pregnancy, or when there is clinical concern, a condition should move from category A to B, or B to C.

NB. It should be noted that for Cardiac, the nationally agreed classification of maternal medical conditions, A, B, C, has been deferred, as the mWHO classification has been well established within cardiology, and has been used for consistency with that speciality.

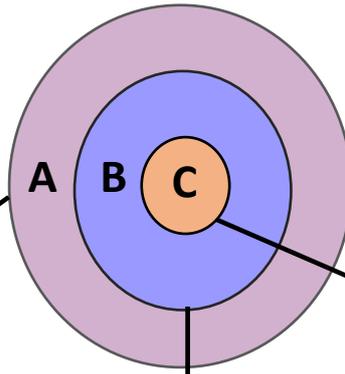
Women of extremely advanced maternal age (>45) or with a raised BMI (>50) in isolation do not meet the requirements for referral to the MMC. However, these women often have co-morbidities. We recommend an individualised risk assessment and referral to the MMC if there are additional medical conditions or concern.

Cardiac

	mWHO I	mWHO II	mWHO II-III	mWHO III	mWHO IV
Diagnosis (if otherwise well and uncomplicated)	<p>Small or mild</p> <ul style="list-style-type: none"> - pulmonary stenosis - patent ductus arteriosus - mitral valve prolapse <p>Successfully repaired simple lesions (atrial or ventricular septal defect, patent ductus arteriosus, anomalous pulmonary venous drainage)</p> <p>Atrial or ventricular ectopic beats isolated</p>	<p>Unoperated atrial septal or ventricular defect</p> <p>Repaired tetralogy of Fallot</p> <p>Most arrhythmias (supraventricular arrhythmias)</p>	<p>Mild left ventricular impairment (EF >45%)</p> <p>Hypertrophic cardiomyopathy</p> <p>Native or tissue valve disease not considered WHO I or IV (mild mitral aortic stenosis)</p> <p>Marfan or other HTAD syndrome without aortic dilatation</p> <p>Aorta <45 mm in bicuspid aortic valve pathology</p> <p>Repaired coarctation</p> <p>Atrioventricular septal defect</p> <p>Turners Syndrome</p> <p>All channelopathies (event rate not applicable)</p>	<p>Moderate left ventricular impairment (EF 30-45%)</p> <p>Previous peripartum cardiomyopathy without any residual impairment of left ventricular function</p> <p>Systemic right ventricle with good or mildly decreased ventricular function</p> <p>Fontan circulation. If otherwise the patient is well and the cardiac condition uncomplicated</p> <p>Unrepaired cyanotic heart disease</p> <p>Other complex heart disease</p> <p>Moderate mitral stenosis</p> <p>Severe asymptomatic aortic stenosis</p> <p>Moderate aortic dilatation</p> <p>Ventricular tachycardia</p>	<p>Pulmonary arterial hypertension (managed in Sheffield PH service)</p> <p>Severe left ventricular dysfunction (EF <30% or NYHA class III-IV)</p> <p>Previous peripartum cardiomyopathy with any residual left ventricular impairment</p> <p>Severe mitral stenosis</p> <p>Severe symptomatic aortic stenosis</p> <p>Systemic right ventricle with moderate or severely decreased ventricular function</p> <p>Severe aortic dilatation</p> <p>Vascular Ehlers-Danlos</p> <p>Severe (re)coarctation Fontan with any complication</p> <p>Mechanical valve</p>

	mWHO I	mWHO II	mWHO II-III	mWHO III	mWHO IV
Risk	No detectable increased risk of maternal mortality and no/mild increased risk in morbidity	Small increased risk of maternal mortality or moderate increase in morbidity	Intermediate increased risk of maternal mortality or moderate to severe increase in morbidity	Significantly increased risk of maternal mortality or severe morbidity	Extremely high risk of maternal mortality or severe morbidity
Maternal cardiac event rate	2.5-5%	5.7-10.5%	10-19%	19-27%	40-100%
Pre-pregnancy Counselling	Optional- local unit	Yes-local unit	Yes- local unit	Yes: expert counselling required	Yes: expert counselling required
Care during pregnancy	At the Local hospital. If there are concerns, or a lack of expertise or timely review in the local hospital, refer to the obstetric cardiology clinic at the local MMC for review or advice.	At the Local hospital. If there are concerns, or a lack of expertise or timely review in the local hospital, refer to the obstetric cardiology clinic at the local MMC for review or advice.	Refer to the Obstetric Cardiology Clinic at the local MMC for MDT consideration about where antenatal care and delivery is most appropriately located irrespective of where they usually attend for their cardiac care. For some women, delivery may be appropriate in their local unit.	Refer to the Obstetric Cardiology Clinic at the local MMC for MDT consideration about where antenatal care and delivery is most appropriately located irrespective of where they usually attend for their cardiac care.	Refer to the Obstetric Cardiology Clinic at their local MMC for regional MDT discussion and decision about transfer of antenatal care and delivery. Pulmonary Hypertension cases discussed in MMC MDT -managed in Sheffield PH Service
Minimal follow-up visits during pregnancy	Once or twice	Once per trimester	Bimonthly	Monthly or Bimonthly	Monthly
Location of delivery	Local hospital	Local Hospital or Individualised assessment after MDT review	Individualised assessment after MDT review	Expert centre for pregnancy and cardiac disease as decided at MMC MDT review	Expert centre for pregnancy and cardiac disease as decided at MMC MDT or Regional MDT

Lung disease



Category A

Local expertise

Category B

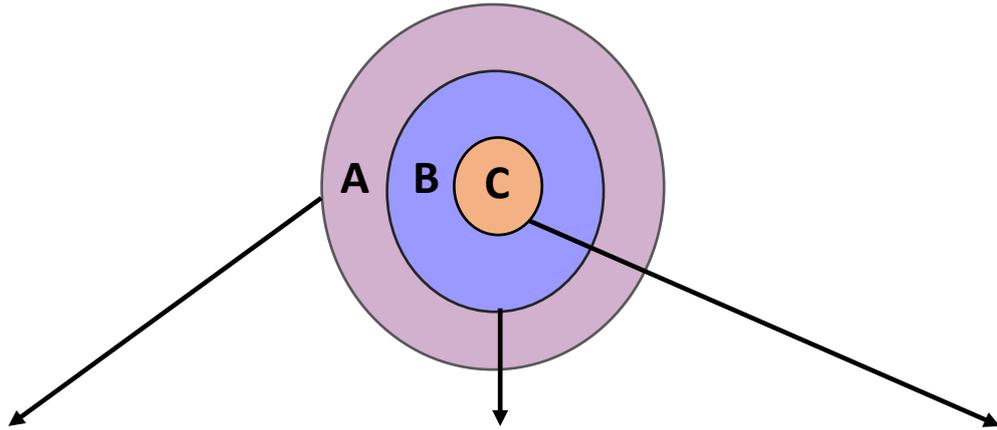
Clinical review, advice and guidance from Maternal Medicine Centre

Category C

Care led by Maternal Medicine centre

Uncomplicated Asthma	Complicated asthma: <ul style="list-style-type: none"> Repeated presentations of asthma (≥ 3) in pregnancy Asthma receiving biologics Long-term corticosteroids 	Sickle chest crisis (see Haematology pathway)
Pneumonia	Restrictive lung disease (eg ILD, kyphoscoliosis) with FVC $>50\%$	Restrictive lung disease (eg ILD, kyphoscoliosis) with FVC $<50\%$
TB	Any respiratory condition receiving immunotherapy / biologics	Neuromuscular disorders with respiratory muscle involvement eg myasthenia gravis, Guillain-Barré syndrome
Chronic Obstructive Airways Disease	Bronchiectasis	Cystic fibrosis
Pneumothorax	New diagnosis of obstructive sleep apnoea/obesity hypoventilation in pregnancy	Lung transplant
Sarcoidosis without restrictive lung disease, no renal involvement	COVID pneumonitis	Pulmonary vasculitis
Managed obstructive sleep apnoea/obesity hypoventilation	Lung cancer	
Pulmonary embolus (see Haematology pathway)		

Gastrointestinal and Liver Disease



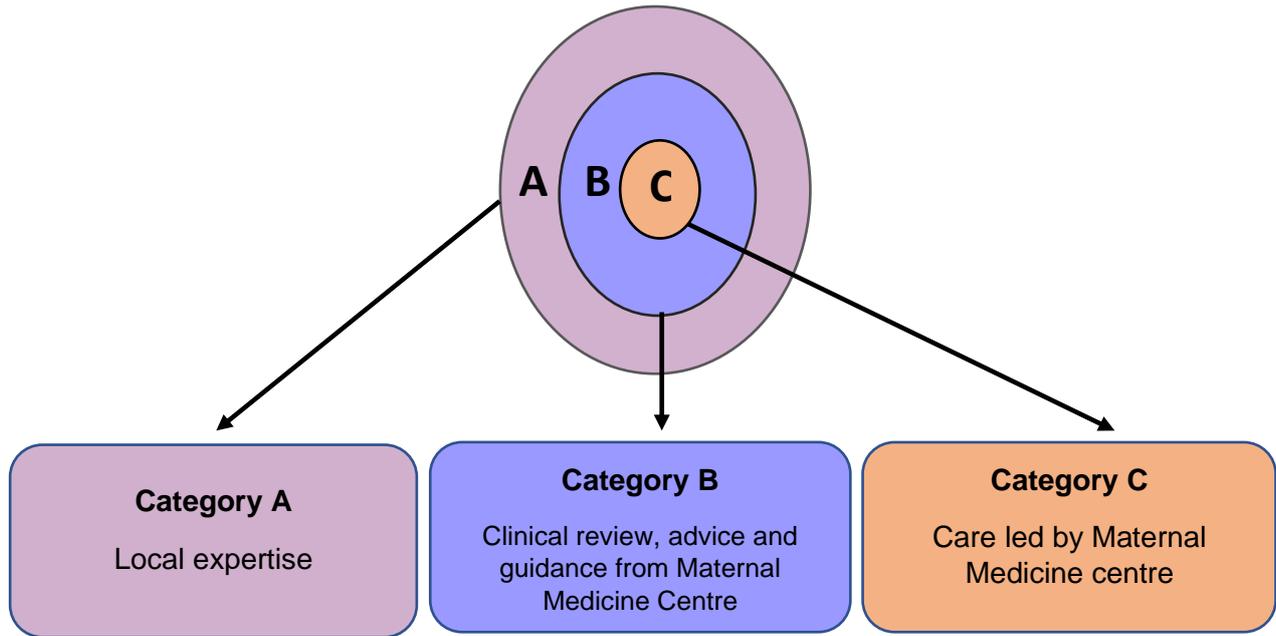
Category A
Local expertise

Category B
Clinical review, advice and guidance from Maternal Medicine Centre

Category C
Care led by Maternal Medicine centre

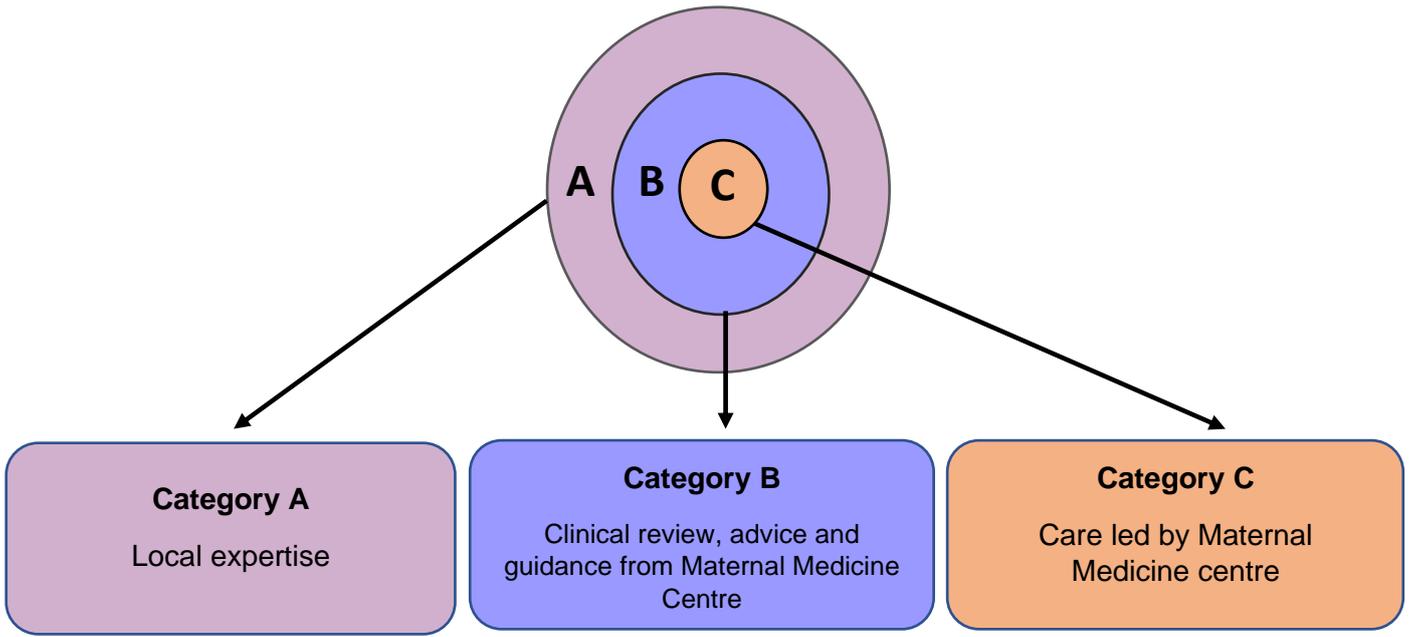
Hyperemesis gravidarum	Complex inflammatory bowel disease: <ul style="list-style-type: none"> • Active disease despite treatment • Biologics • Corticosteroids • Peri-anal disease • Pouch/stoma 	Portal hypertension
Constipation	Acute and chronic pancreatitis	Complex pancreatitis <ul style="list-style-type: none"> • Not responding to treatment • Recurrent disease • Hypertriglyceridaemia • IR/surgical intervention
Gallstones	Treated GI malignancy	Active malignancy
Gastro-oesophageal reflux disease	Unexplained jaundice	Cirrhosis
Coeliac disease	Acute fatty liver of pregnancy	Decompensated liver disease/liver failure*
Viral hepatitis	Achalasia	Liver transplant
Intrahepatic cholestasis (bile acids <100)	Intrahepatic cholestasis (bile acids ≥100)	
Uncomplicated inflammatory bowel disease in remission	Liver infarction/haematoma	
Cholecystitis	Autoimmune hepatitis	
Viral hepatitis	Wilson's disease	
HELLP	Crigler Najjar syndrome	
	Primary biliary cirrhosis	
	Primary sclerosing cholangitis	

Diabetes



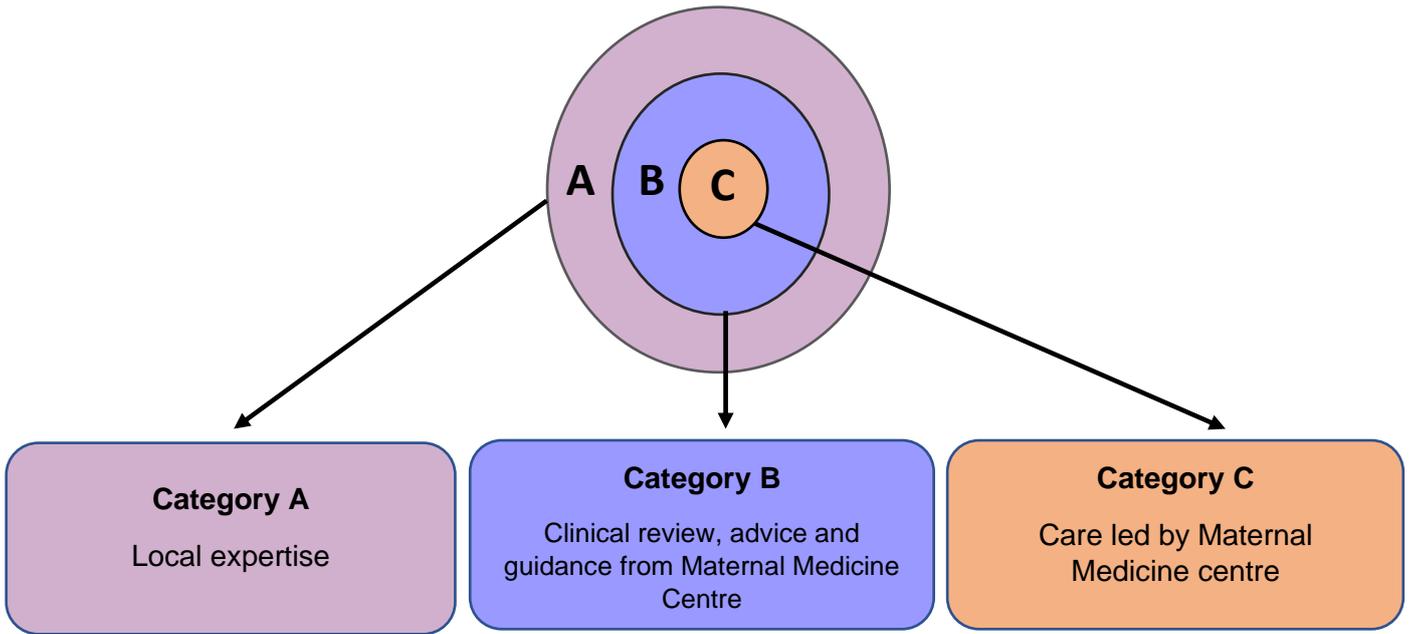
Gestational diabetes mellitus	Diabetic nephropathy - Nephropathy Creatinine >70mmol/l or PCR >30 mg/mmol	Diabetic nephropathy – creatinine >120 or PCR >300 mg/mmol
Type I and II diabetes mellitus without complications or co-morbidities	Diabetic retinopathy requiring treatment during pregnancy (where local ophthalmology services are not providing treatment)	Complex diabetic retinopathy requiring treatment (significant nephropathy likely to coincide)
	Autonomic neuropathy causing significant complications eg. gastroparesis	Cardiovascular complications e.g. Congenital or acquired cardiac diseases, Cerebrovascular diseases, Resistant hypertension
	Monogenic diabetes	

Endocrine Disease



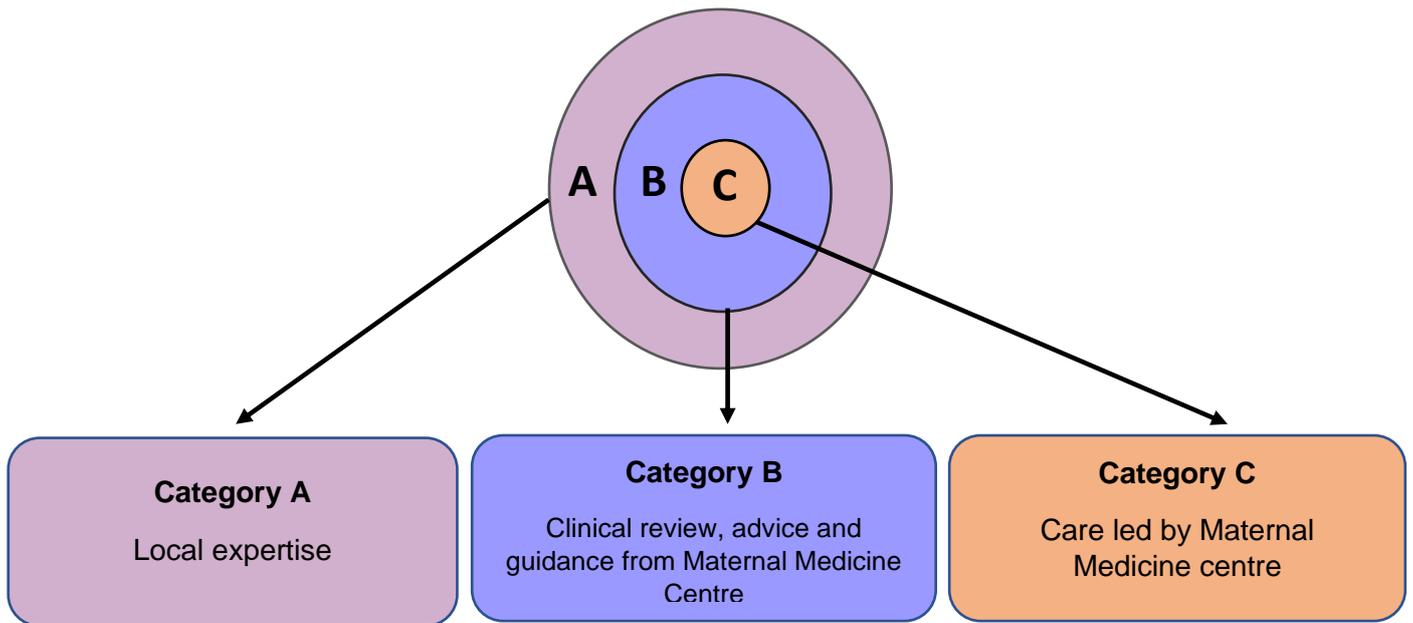
Hypothyroidism	Thyroid hormone resistance	Primary and secondary hyperaldosteronism
Hyperthyroidism and gestational hyperthyroidism	Thyroid cancer	Phaeochromocytoma or paraganglioma
Thyroid nodules	Macroprolactinoma	Cushing's syndrome
Microprolactinoma	Pituitary disease on hormone replacement therapy	Acromegaly
PCOS	Congenital adrenal hyperplasia	Metabolic disorders such as Glycogen storage disorder
Vitamin D deficiency	Dumping syndrome post bariatric surgery	Hyperparathyroidism
	Addison's disease	Hypoparathyroidism

Kidney Disease



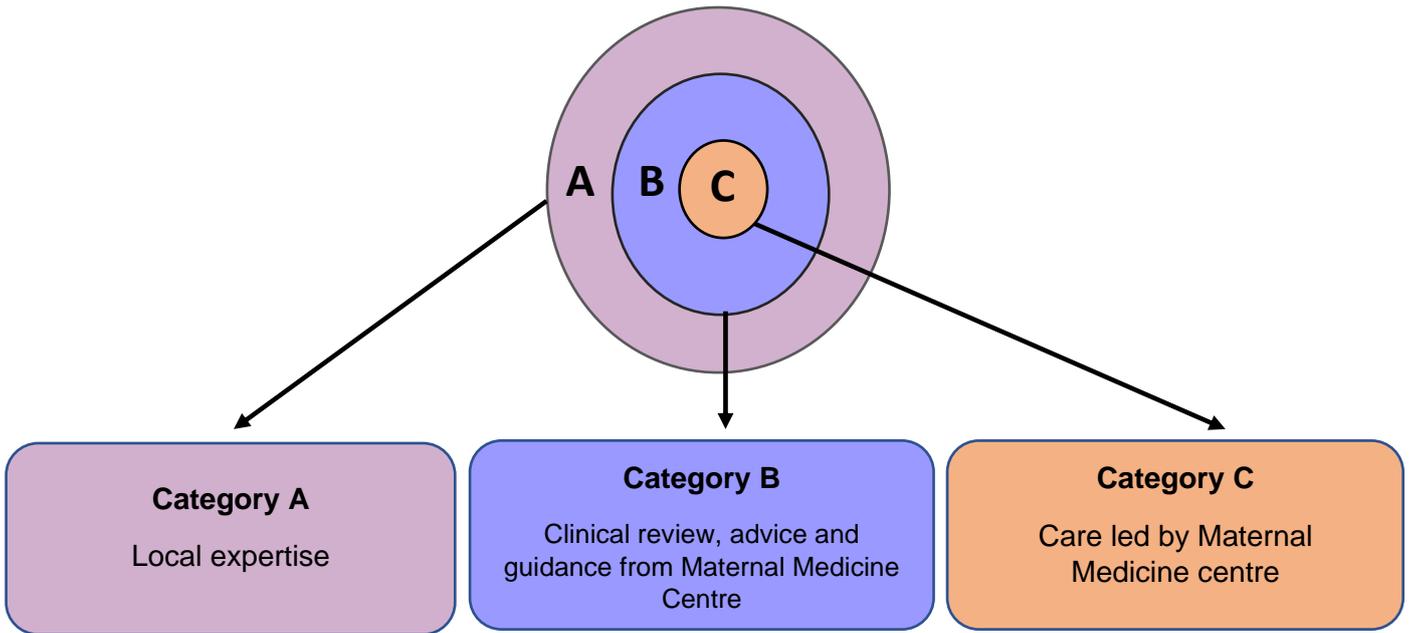
Single kidney	Lupus nephritis in remission or on treatment	Active lupus nephritis
Non-lupus glomerulonephritis/ tubulointerstitial nephritis: <ul style="list-style-type: none"> • No immunosuppression AND • Stable pre-pregnancy CKD stage 1-2 AND • uPCR <100 or uACR <30 AND • BP <140/90 	Non-lupus glomerulonephritis/ tubulointerstitial nephritis: <ul style="list-style-type: none"> • On immunosuppression OR • Pre-pregnancy CKD stage 3 OR • uPCR ≥100 or uACR ≥ 30 OR • BP >140/90 	Pre-pregnancy CKD stages 4 and 5
Kidney stones	Kidney transplant	Combined kidney-pancreas transplant
Recurrent UTI no immunosuppression	Recurrent UTI on immunosuppression	Dialysis
Reflux nephropathy with normal kidney function	Reflux nephropathy with abnormal kidney function	New renal vasculitis in pregnancy and vasculitis on immunosuppression
Autosomal dominant polycystic kidney disease with normal kidney function.	Autosomal dominant polycystic kidney disease with abnormal kidney function	Scleroderma renal crisis
AKI responding to treatment	AKI not responding to treatment or not resolving post-partum	
AKI due to pre-eclampsia resolved post-partum	Previous renal vasculitis in remission, no longer on treatment	
	Previous urinary tract reconstructive surgery	
	Kidney disease requiring OR on biologic treatment	
	Progressive kidney disease in pregnancy	

Rheumatological Disease



Uncomplicated rheumatoid arthritis	Rheumatological disease requiring biologic therapy	Active lupus nephritis (see Kidney Pathway)
Uncomplicated seronegative arthritis: <ul style="list-style-type: none"> • Ankylosing spondylitis • Psoriatic arthritis • Reactive arthritis • IBD related arthritis 	Rheumatological not controlled on current treatment	Large and medium vessel vasculitis
Uncomplicated connective tissue disease: <ul style="list-style-type: none"> • Lupus • Scleroderma (restricted disease) • Sjogren's 	Rheumatological disease with restrictive lung disease and FVC >50% (see Lung Pathway)	Rheumatological disease with restrictive lung disease and FVC ≤50%
Osteoarthritis	Rheumatological disease with kidney involvement (see Kidney Pathway)	New small vessel vasculitis or small vessel vasculitis on immunosuppression
Obstetric antiphospholipid syndrome (see Haematology Pathway)	Thrombotic antiphospholipid syndrome (see Haematology Pathway)	Vascular Ehlers Danlos
Hypermobile Ehlers Danlos (type III)	Other Ehlers Danlos syndromes	Scleroderma renal crisis
	Diffuse scleroderma	Antisynthetase syndrome
	Small vessel vasculitis in remission, no longer on treatment	
	Polymyositis-dermatomyositis	
	Behcet's syndrome	

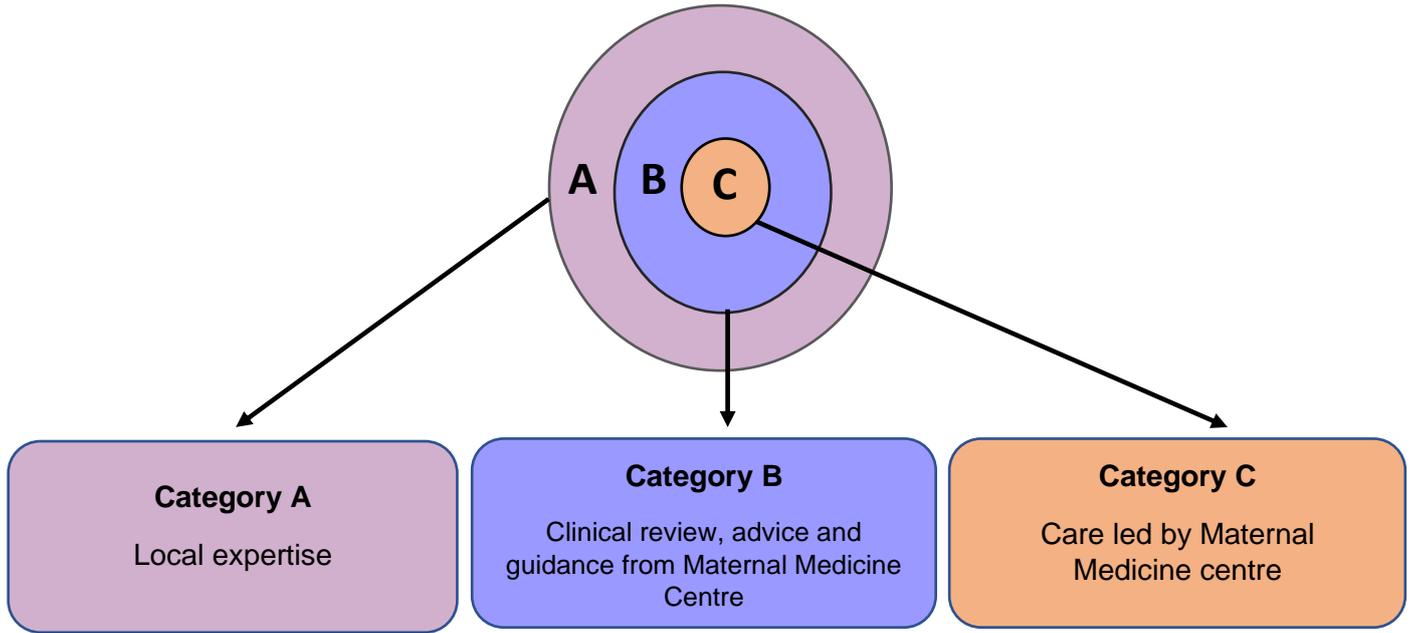
Neurological Disease



Epilepsy managed in a combined clinic including specialist neurology and obstetrics	Cluster headache	All epilepsy without local access to a combined clinic including specialist neurology and obstetrics.
Migraine	Idiopathic intracranial hypertension	Symptomatic raised intracranial pressure
Stable, small cerebrovascular malformation, reviewed within 2 years of conception, plan for mode of delivery	CVM, not reviewed within 2 years of conception	Unstable CVM/AVM/cavernoma Intracerebral bleed within 2 years
Previous brain tumour	Current brain tumour	Progressive brain tumour
Previous cerebral vein thrombosis (CVT)	New cerebral vein thrombosis (CVT)	Acute stroke*
Meningitis	Previous Guillain Barre Syndrome	New-onset Guillain-Barre syndrome
Previous encephalitis	Treated, stable myasthenia gravis	New diagnosis or flare of myasthenia gravis
Stable multiple sclerosis managed without disease modifying drugs	Unstable multiple sclerosis or disease modifying drugs	Myotonic dystrophy
Mononeuropathy eg: Bell's palsy carpal tunnel, peroneal nerve compression	Progressive or persistent mononeuropathy	
Post-dural puncture headache	New encephalitis	

	Reversible Cerebral Vasoconstriction Syndrome (RCVS)	
	Posterior Reversible Encephalopathy Syndrome (PRES)	
	Spinal cord injury	
	Neurofibromatosis	
	Neuromuscular dystrophy	
	Spinal muscular atrophy	
	Motor neurone disease	

Haematological Disease



Sickle cell trait	Current immune thrombocytopenia and platelet count ≤ 75	Sickle cell disease
Historical immune thrombocytopenia and platelet count >75	Thrombocytosis	Beta thalassaemia major
Gestational thrombocytopenia	White cell disorders	Other complex thalassaemia: <ul style="list-style-type: none"> iron overload endocrine disease pulmonary hypertension*
Current VTE or previous single VTE	Recurrent VTE	Current extensive VTE without other access to Factor Xa monitoring
Obstetric antiphospholipid syndrome	Thrombotic antiphospholipid syndrome	Antiphospholipid syndrome with extensive arterial events
Inherited thrombophilia (no VTE, not antithrombin deficiency)	Inherited thrombophilia with previous VTE	Antithrombin deficiency
History of treated haematological malignancy	Stable myeloproliferative/ myelodysplastic disease	Active haematological malignancy
Alpha/beta thalassaemia trait	Mild, isolated clotting factor deficiency <ul style="list-style-type: none"> Factor II, V, XI or XIII $> 0.2\text{iu/ml}$ Factor X $> 0.3\text{iu/ml}$ 	Clotting factor deficiency: <ul style="list-style-type: none"> Factor II, V, XI or XIII $\leq 0.2\text{iu/ml}$ Factor X $\leq 0.3\text{iu/ml}$ Combined deficiencies
B12/folate deficiency	Mild platelet function disorder with platelet count >100	Moderate/severe platelet function disorder or with platelet count >100
	Carriers of haemophilia with known female fetus and normal factor VIII/IX	Carriers of haemophilia with male or unknown gender of fetus

	Type I Von-Willebrand disease, VWF activity normalised in pregnancy	Von-Willebrand disease: Type 1 if VWF not normalised, Type II & Type III
		Transfusion dependent disease