



Maternal medicine network service specification

13 October 2021, Version 1

1. Scope

1.1 Service

This model service specification covers the provision of maternal medicine networks (MMNs). The definitions and dependencies set out below should be used as a guide to establish a service that is tailored to local expertise, needs and opportunities.

1.2 Description

MMNs include pre-pregnancy, antenatal and postnatal care for women who have significant medical problems that pre-date or arise in pregnancy or the puerperium.

Maternal morbidity and mortality are increased by diseases that pre-date pregnancy, and by complications that arise during pregnancy. Pregnancy induces significant changes in all aspects of physiology and so in treatment, optimal outcomes are achieved where care for pregnant women is guided by consultants with specific pregnancy expertise, with input from relevant physicians, rather than the other way round. As many of these conditions are uncommon, advice – and for some women, care – should be provided in a small number of designated specialist centres to concentrate expertise and improve outcomes.

Medical disease relevant to a maternal medicine service includes but is not limited to:

- Cardiac disease
- Respiratory disease
- Renal disease
- Haematology
- Rheumatological disease
- Endocrine disease
- Gastrointestinal and liver disease
- Neurological disease
- Skin disease
- Cancer.

It also includes acute illness where the underlying condition is not clear, such as:

- Headache
- Breathlessness
- Chest pain
- Abdominal pain
- Fever/sepsis.

[Recent MBRRACE reports](#) show that progress to reduce the triennial rate of maternal death nationally has stalled since 2011-13. For 2016-18, 'Indirect' causes of maternal death – such as cardiac and neurological disease, and sepsis – continue to outweigh 'direct' causes. More than two thirds of women who died had pre-existing physical or mental health problems. In 2016-18, 23% of deaths were attributed to cardiac disease alone, and 13% occurred in women with epilepsy. Many of these deaths could potentially be avoided by early referral to a multidisciplinary team (MDT) of physicians, obstetricians, midwives, nurses, psychiatrists and other specialists with specific training and experience in the care of medical diseases in pregnancy.

MBRRACE reports and experience during the COVID-19 pandemic have highlighted that some women, particularly those from Black, Asian or some ethnic minority backgrounds, as well as those in the most socially deprived groups, are more likely to die during or after pregnancy. Tackling these inequalities needs focussed multidisciplinary leadership, to ensure that women receive the best, most suitable care in healthcare settings that are accessible and where care is explicitly designed to meet their needs. Our vision is to ensure exceptional quality care for all through equitable access, excellent experience and optimal outcomes.

MBRRACE reviews have also identified maternal suicide as the leading cause of direct deaths within a year after pregnancy. While this specification focuses on the identification and management of physical health issues, effective collaboration between physical and mental health services is vital. Evidence shows that services designed in an integrated way reduce stigma of mental health, improve patient experience and outcomes by providing more coordinated and collaborative care.

2. Care pathway and clinical dependencies

2.1 Care pathway

MMNs and maternal medicine centres (MMCs)

The MMN is responsible for ensuring that all women in the network's footprint with significant medical problems will 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 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 MDT that includes an appropriately trained obstetrician eg with sub-specialty training in maternal fetal medicine or equivalent; an obstetric physician or equivalent physician with appropriate training; and an appropriately trained midwife or team of midwives (see 4.2 for further details on staffing).

Critically, to address inequalities in maternal outcome, the MMN will need to ensure that pathways are in place to ensure equal access to specialised care for all women, and that referral criteria reflect the increased vulnerability of women from ethnic minorities and those who are socially deprived. To help identify and address socio-cultural barriers to accessing quality care, the MMN should engage at an early stage with public health doctors and consultant level (Band 8) midwives with explicit public health expertise.

An MMC, hosted by a lead provider, will provide regional clinical leadership – on the identification, referral and management of women with medical conditions, including co-developing guidelines and referral pathways. In addition the MMC will ensure that appropriate education is in place across the network for all clinicians – ie midwives, obstetricians, GPs and emergency department (ED) staff – to improve local identification and referral of acute issues that have particular significance in women who are or have recently been pregnant. The MMN will need to work with other relevant networks including clinical networks for maternity services, perinatal mental health networks, neonatal operational delivery networks (ODNs) and fetal medicine services to ensure the health needs of mother and baby are met.

The MMC will also host the specialist MDT described above, which will provide advice and care for the most complex/highest risk women, along with system-wide leadership and education. The centre will be hosted by a designated lead provider. MMNs may contain more than one MMC, depending on the network's footprint and availability of suitable host providers with appropriate expertise (as set out in 2.2).

The majority of women with complications during pregnancy will continue to be managed by local maternity services. The proportion of a woman's care delivered by a MMC will vary according to individual need. For some women, a single visit to the MMC or communication with the MMC by the local unit will suffice. For the highest risk and most complex women, it may be that all care will be recommended to be delivered within the MMC.

There is no definitive list of the complex co-morbidities requiring specialist maternal medicine services – this is for local agreement – but an example of indications for referral for opinion or transfer of care as adopted in the London MMNs is provided in Appendix 1. It is envisaged that only a very small number of women would be indicated to receive all care at the MMC. Effective models of maternal medicine should integrate with local, regional and national models of care to minimise inappropriate referrals into the specialist centre, and support local units to provide the right care at the right time, in the right place.

The provider(s) hosting the MMC will provide appropriate managerial and administrative support for the effective operation of the network. The provider(s) will also take responsibility for ensuring the quality service provided by the MMC and the wider MMN.

Local maternity systems and their host integrated care systems (ICSs) are responsible for agreeing MMN footprints and their respective MMCs with oversight from NHS England and NHS Improvement regional boards and maternity strategic clinical networks.

Chronic medical problems diagnosed pre-pregnancy

Women with chronic medical conditions should receive personalised care as described below.

Pre-pregnancy

Women might:

- Attend their GP or specialist physician and mention a desire for pregnancy. For certain conditions, all women of child-bearing age should be routinely offered pre-pregnancy care (PPC).
- Be referred to secondary care or MMC for PPC by their GP or specialist physician.

Referral pathways will need to be co-produced between primary care and the MMN with input from users to ensure equitable access to PPC. Whether the woman is referred to an MMC will depend on the complexity of the medical problem (see Appendix A), and the level of expertise at her local unit. For example, it might be agreed a woman with a renal transplant or complex connective tissue disease will be seen for PPC in the MMC, whereas a woman with inflammatory bowel disease (IBD) could be seen by her usual gastroenterologist.

Antenatal and Intrapartum

Women might:

- Declare a history of medical problems at midwifery booking
- Be referred to local consultant obstetrician or MMC by GP, midwife or specialist physician.

Whether the woman is seen locally or at an MMC will depend on the complexity of the medical problem and the level of expertise at her local unit.

When a woman is seen in the MMC, a number of options are available:

- Offer advice regarding pregnancy care and delivery and then referral back to local unit
- Share care with local unit and MMC (may recommend delivery in local unit or MMC)
- MMC to take over obstetric care (delivery recommended at MMC).

Whatever the decided place of delivery, intrapartum care will be guided wherever possible by a care plan co-produced by the mother and the MDT advising her.

Postnatal

Where delivery has taken place at MMC, a woman will be discharged with one of the following discharge plans:

- follow up by local hospital physician or GP as appropriate
- follow up at MMC (this will only be for very complex medical conditions – or if intercurrent problems have developed).

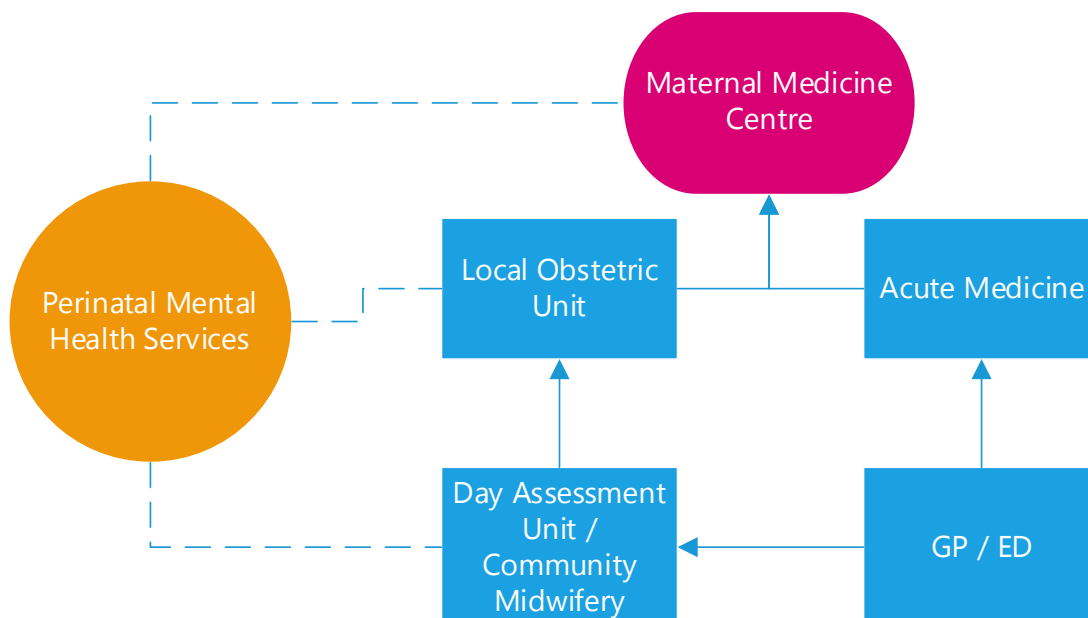
Acute medical problem diagnosed in pregnancy and puerperium

Women might present with an acute medical problem via primary care, emergency department, acute medicine, community midwifery, gynaecology or obstetric services. Maternity services are to be informed at the earliest opportunity after presentation, and are to be involved in the woman's care where required from that point.

Clear protocols should be developed and agreed across all providers in the Network on the referral of acute issues that have particular significance in women who are or have recently been pregnant, and who to call within the MMC for advice if there is clinical concern or uncertainty.

There should be an appropriate mechanism for arranging timely **transfer to MMC** and repatriation when women need more specialist care. This should be agreed ‘consultant to consultant’ and by both relevant physicians and obstetricians.

Figure 1: MMC networking with other services



All the services identified above will contribute to a maternal medicine network. However, the MMN will also need to engage with all those who might provide part of the care pathway, eg health visitors, social work, ambulance trusts, mental health, and the voluntary sector. The MMN will ensure that referral pathways and responsibilities for supervision are clarified in agreed protocols that cover all parts of the possible pathway – eg referrals from ED to obstetric services as well as from local obstetric units (spokes) to the MMC.

An overarching principle of the MMN, and one supported by the MMC, is that care will always remain as local as is compatible with the need for timely access to the MDT (see below) or specialised facilities. Consistent with this approach is that although the MMC will provide specific maternal clinical leadership and expertise in the form of an obstetric physician (or equivalent – see 4.2) this is not intended to replace input of physicians across the MMN, but rather to co-ordinate, standardise and improve pregnancy specific care.

The overriding aim of these services must be to ensure equitable access, excellent experience, and optimal outcomes for women from all communities. The service should use the health inequalities programme matrix (see Appendix 2) to assess the extent to which the service design, deployment and evaluation are addressing health inequalities.

2.2 Co-dependencies with other services

The following specialties or facilities should be co-located on the same hospital site as the maternal medicine centre. They should function as part of the MDT. Consultants from the following services should be able to provide emergency bedside care (call to bedside within 60 minutes).

- Obstetrics
- Gynaecology
- Neonatal intensive care: Level 3
- Adult intensive care: Level 3, capable of multi-organ failure support.
- High dependency beds: Level 2, staffed by medical and nursing teams experienced in managing pregnant women.
- Obstetric anaesthesia
- General surgery
- Acute medicine
- Acute stroke services
- Cardiology general adult cardiology services, including acute cardiac care unit.
- Haematology and appropriate support services including blood transfusion and coagulation support
- Radiology with imaging.

The following should be available to consult with a clinical assessment or telephone advice as appropriate within 12 hours:

- Diabetes and endocrinology
- Nephrology/renal replacement therapy
- Respiratory
- Rheumatology
- Gastroenterology
- Hepatology
- Neurology
- Vascular surgery
- Urology
- ENT
- Oncology
- Dermatology
- TOP
- Fetal medicine.

2.3 Funding and commissioning MMNs

In general, physician-led appointments and medical diagnostics – including care required for women with the most complex problems – is funded through the same relevant specialty budgets used for non-pregnant patients. Maternal medicine services provide the expertise to manage the additional complexity related to pregnancy.

Maternal medicine activity is funded locally through maternity tariff. Under maternity pathway payment arrangements, referrals between providers for opinion/advice, or transfers of care in the antenatal period¹ have been funded inconsistently through provider to provider payments – also known as cross-charging. These arrangements are associated with payment disputes and are administratively burdensome.

To avoid the financial uncertainty and administrative burden of cross-charging and ensure sustainable and equitable funding in line with system-led aligned payment and incentives, **MMNs should be funded locally through a lead commissioner model**. In practice, this means the MMC host organisations will receive an annual allocation from a lead commissioner, with all other constituent commissioners in a network footprint contributing a fair share of funding.

At a minimum, **funding must be modelled to cover the staffing capacity required for referrals into the MMC for advice or care, and provide system-wide leadership and education as part of running the network, as set out in 4.2 below**. Funding could also be used to support specialist maternal medicine staffing and activity in spokes, in accordance with the agreed clinical model for the network.

In meeting the required staffing capacity, some consultant-level staff might work part-time for the MMN. PAs spent at the network and their relevant department should be clearly defined, and agreements for funding these PAs to be shared between the network and department in accordance.

To ensure optimal funding for best practice care, local commissioners should ensure that revised funding arrangements are appropriate and use the following funding sources:

1. Existing spending relating to maternal medicine referrals

Local audits have demonstrated that significant maternal medicine referral activity is already funded through maternity tariff, as set out above. Modelling based on audits undertaken in Thames Valley valued this at £4.2m nationally. Using the Personal Social Services Research Unit (PSSRU) costing methodology, for every 36,200 births, a network at the minimum staffing level set out in section 4.2 would be affordable with historic funding. Note the funding detailed in point 2 below is in addition to these historical funds.

¹ In the case of an antenatal transfer of care, intrapartum and postnatal care is funded by local commissioners through existing contractual mechanisms.

2. Additional clinical commissioning group (CCG) baseline funding for MMNs from 2021/22

From 21/22, an additional £9.8m will be allocated to CCG baselines to support the provision of MMNs, and pre-term birth clinics.² This should be used to supplement existing funding, and secure sufficient additional capacity for network-level activities including leadership, training, education and outreach, and more generally to provide an optimal staffing level for best practice care as set out in 4.2.

In summary, the lead commissioner model presents an opportunity to streamline, formalise and supplement existing funding flows, and ensure sustainable best practice care.

It is for local commissioners to agree the basis of fair shares to fund the Network. The establishment of the MMN presents an important opportunity to audit the rate and complexity of referrals following the agreement of local pathways, to ensure that funding flows are appropriate, equitable and sustainable. In the meantime, commissioners should agree a bridging measure for calculating these fair shares – such as rates of delivery – for revision in future years, once this data has been collected.

To support these discussions, a tool, which can be found [here](#), has been created to support calculating:

- estimated costs for MMC and wider network staffing
- respective CCG shares of this cost based on deliveries
- existing spend on maternal medicine referrals by CCG, based on national modelling
- the estimated value of additional CCG baseline funding.

With this locally commissioned model there is also a need for regional oversight and co-ordination to ensure consistent network coverage across the country, and to ensure that services are commissioned in line with this specification.

Appointments for pre-pregnancy counselling will be funded through local commissioning arrangements with the CCG.

² Pre-term birth clinics are required as part of Element 5 of the [Saving Babies' Lives Care Bundle \(Version 2\)](#). Local maternity systems should work with CCGs to determine the respective funding required to comply with this requirement, and the agreed staffing for maternal medicine.

3. Population covered and population needs

3.1 Population covered by this specification

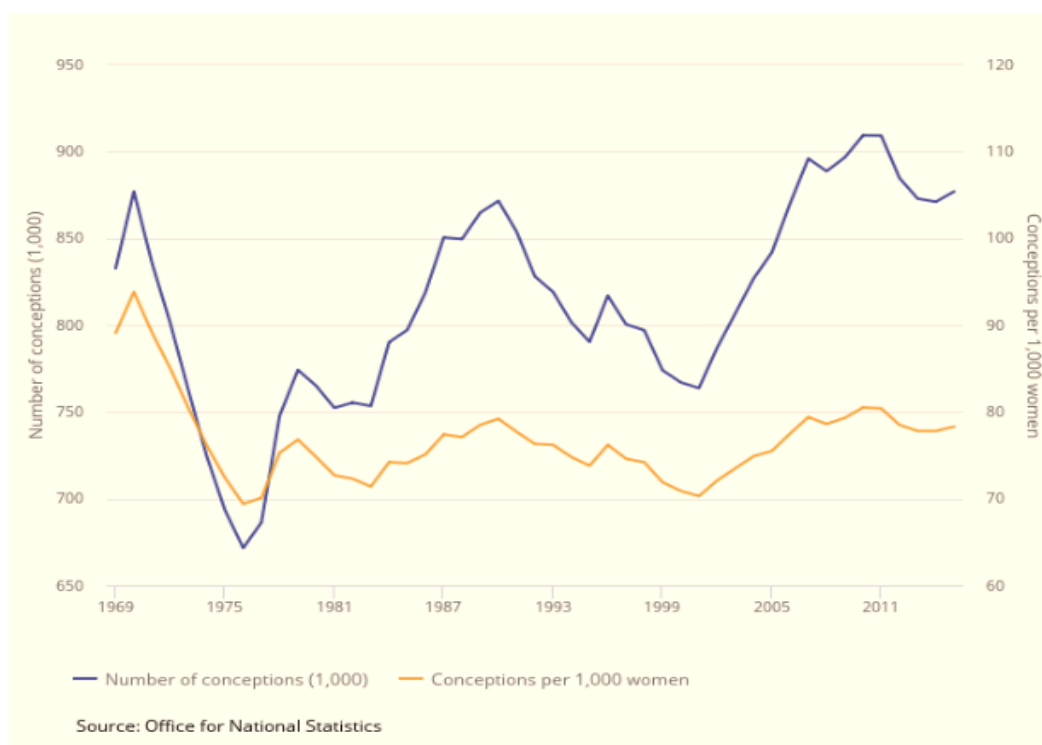
This service is for all women in England who wish to become pregnant, are in antenatal or postnatal care and who have medical problems that pre-date or arise in pregnancy.

3.2 Population needs

In 2015 there were an estimated 876,934 conceptions to women of all ages, compared with 871,038 in 2014, an increase of 0.7%. Despite the rise and fall in actual numbers the rate of conception per 1000 women has remained quite steady over the past two decades.

Local maternity systems will need to ensure suitable capacity within the MMC's multi-disciplinary team, based on analysis of local case mix.

Figure 2: The number of conceptions and the conception rate for all women, 1969 to 2015 (England and Wales)



3.3 Evidence base

- Maternity Matters: Choice, access and continuity of care in a safe service, Department of Health, 2007 sets out the Government's commitment for modern NHS maternity services and provides a national framework for local delivery.
- BETTER BIRTHS: Improving outcomes of maternity services in England, A Five Year Forward View for maternity care, 2016

- MBRRACE-UK Confidential Enquiry into Maternal Death 2020 (and numerous previous CEMACH and MBRRACE publications on maternal death).
- Patterns of maternity care in English NHS trusts 2013/14, 2016
- Trends in Maternal Mortality: 1990 to 2015 Estimates by WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division
- Ockenden review of maternity services at Shrewsbury and Telford Hospital NHS Trust: Emerging findings and recommendations from the independent review of maternity services at the Shrewsbury and Telford Hospital NHS Trust. Dec 2020

4. Outcomes and applicable quality standards

4.1 Quality statement – aim of service

- To provide advice and planned care for women with pre-existing medical conditions, before, during and after pregnancy – ensuring equitable access, excellent experience and optimal outcomes for all communities served by the service.
- To provide advice and planned intrapartum and postpartum care for women with medical conditions that arise during pregnancy
- To provide local clinical leadership on the identification, referral and management of women with medical conditions, including reviewing training, clinical guidelines and referral pathways for all staff in contact with pregnant women across the footprint.
- To reduce inequities in pregnancy outcomes relating to medical complexity across all demographics

Table 1: NHS outcomes framework domains

Domain 1	Preventing people from dying prematurely	X
Domain 2	Enhancing quality of life for people with long-term conditions	X
Domain 3	Helping people to recover from episodes of ill-health or following injury	X
Domain 4	Ensuring people have a positive experience of care	X
Domain 5	Treating and caring for people in safe environment and protecting them from avoidable harm	X

4.2 Indicators include:

Staffing

The MMN must ensure there is suitable capacity within the MMC's MDT, based on analysis of local case mix, and the distribution of local clinical expertise. However, at a minimum, capacity will be achieved for each MMC by funding the following staff:

- 5PAs/0.5 WTE Obstetrician (sub-specialist in maternal fetal medicine or equivalent)
- 10PAs/1 WTE Obstetric Physician
- 1 WTE Specialist Midwife (B8 or in line with local requirements).

The funding proposed for the obstetric consultant and obstetric physician posts will cover their activities for the MMN and MMC; the remaining 0.5 WTE of their time may be spent on other, non-MMN related activities eg labour ward cover, or duties as an acute physician. Requirements for these posts and the staffing of the MMC is set out in greater detail below.

Each MMC will have a dedicated specialist MDT that meets weekly to consider case management and to review outcomes of pregnancies cared for in the service. There should be arrangements for appropriate cover within the centre out of hours, with a longer-term aspiration to ensure that maternal medicine advice is available 24/7.

The precise WTE split of the MMC MDT – and funding maternal medicine staffing across the wider network – is to be agreed locally and with regional NHS leadership, in view of the specific requirements of the network, the levels of existing referrals and anticipated levels of activity. However, at a minimum, the MDT should include:

- 0.5 WTE / 5PAs lead specialist obstetrician or obstetricians with evidenced clinical expertise and appropriate competency³ in maternal medicine.
- 1 WTE / 10 PAs lead obstetric physician with evidenced clinical expertise and appropriate competency in obstetric medicine. As an interim measure, before the MMN has an appropriately trained obstetric physician, this could be a team of physicians⁴ with experience of running a joint obstetric clinic dedicated to medical problems in pregnancy, such as an acute physician, and a diabetologist / endocrinologist / rheumatologist / haematologist / neurologist / nephrologist. At least

³ Assessing competency is the responsibility of the employing trust who should request peer review from a sub-specialist in maternal fetal medicine for this assessment. Qualifications that would help evidence competency would include maternal fetal medicine sub-specialty training or a maternal medicine advance training skills module.

⁴ Assessing competency is the responsibility of the employing trust. Competency will usually be achieved by completing training as defined by the RCP London curriculum. Where training has not been completed, equivalent competency should be determined by evidenced clinical expertise and confirmed by an established obstetric physician.

one member of this physician team should be on the acute medical rota to ensure that the team has the experience to advise on the management of acute medical complications in pregnant women.

- 1 WTE lead specialist midwife (B8) with expertise in antenatal, intrapartum and post-partum management of women with medical problems.

Midwifery is a key component of the multidisciplinary service. The lead midwife should have the experience and leadership to co-ordinate midwifery models of care so that they contribute to the successful operation of the network, and the network supports midwife-led models of care and continuity of carer. This could be achieved across the network through the establishment of continuity of carer teams with specific expertise of providing care for women with medical complexity.

This MDT should also receive input and support from obstetric anaesthetists. In addition, the MMC will provide obstetric anaesthetic leadership across the MMN to ensure that, where appropriate, obstetric anaesthetists in 'spoke' units are enabled, through training and professional support to care for most women locally.

The lead obstetrician, physician and midwife will provide clinical leadership to improve the care of women who are pregnant and have acute or chronic medical conditions, Importantly, the leadership will need to extend to all parts of the network footprint (see Figure 1).

Typically, this will involve coordinating:

- Clinical care pathways
- Communication within MMNs
- Protocols for management/standards
- Indications for transfer for delivery at the MMC
- Training of physicians, obstetricians and midwives in maternal medicine
- Sharing of expertise across the MMN through satellite MDTs and clinics (eg the obstetric physician providing outpatient care in different sites (in person or virtually) within the MMN), clinical teleconferences; facilitating easy access to a clinical opinion.

It is recognised that these leadership roles will be complex, operating across disciplinary, institutional and geographic boundaries to meet network aims. The MMC will therefore need to ensure that they have sufficient time defined in job descriptions for leadership activity, that they have administrative support and that are encouraged to develop leadership, as well as clinical skills. Funding could also be used to support specialist maternal medicine staffing and activity in spokes, to support this network approach.

Operational resilience and succession planning

The MMC should have an operational resilience plan to maintain service delivery through periods of planned and unplanned absence.

As part of this, the MMC should address current and future staffing needs through succession planning against critical posts and ensure that development opportunities are in place for those with the potential to fill these posts.

Training and education

Each MMC should have responsibility for ensuring continuing professional development for all staff delivering maternal medicine care. The competency-based programme should focus on the acquisition of knowledge and skills such as clinical examination, assessment, diagnostic reasoning, treatment, facilitating and evaluating care, evidence-based practice and communication. Skills in teaching, research, audit, guideline development and management will also be part of the programme. The educational programme should include modules on addressing health inequalities in relation to maternal health.

The MMC should also deliver standardised training and competency-based education programmes across the MMN footprint to identify key red flags and indications for referral.

Organisation, governance and audit

Each MMC should demonstrate a robust policy for collaboration with each other and with NHS commissioners for audit, including formal inter-unit peer review at least every five years. As set out in 2.3, this audit should include, for each MMC, rates and complexity of referrals from other providers in the network, to inform a sustainable and equitable funding model between local commissioners.

Each MMC should have a dedicated management group for the internal management and coordination of service delivery. The group should comprise the different departments and disciplines delivering the service.

Communication with women

All information and guidance produced by the network should be culturally competent and delivered through accessible channels. This means co-production with service users that are culturally diverse to ensure that the plan is reflective of the needs of women from all communities especially those impacted by health inequalities, namely:

- ethnic minority communities
- those from the most deprived quintile by Index of Multiple Deprivation (IMD)
- learning disability/autism and severe mental illness

- inclusion health groups (homeless, Traveller, Gypsy, Roma communities and other protected characteristics).

MMNs should demonstrate that arrangements are in place that allow women to participate in decision-making at every stage in their care and that their personalised care plans are informed by the maternal medicine MDT.

In addition, women should be given a detailed written care plan forming a patient care record in plain language identifying follow up arrangements. The plan should be copied (with consent) to all involved clinicians and the woman's GP.

Referral pathways within the MMN should be designed to minimise travel where possible, tailoring care provision to each woman's needs and using innovative solutions to providing care as close to home as possible. All MMNs will need to monitor women's experience of receiving care; in particular, data collection around women's experience should ensure appropriate representation from those groups impacted by health inequalities (see list above).

Data recording and submission

Care should be recorded in an electronic patient record (maternity information system) and relevant data including diagnosis codes should be submitted monthly as part of the trust's maternity services data set (MSDS) submission. Data describing ethnicity and IMD should be collected for all women.

5. Applicable service standards

In addition to the co-dependencies set out in 2.2, MMCs should be designated according to the following criteria:

The provider should:

- Have a sufficient case load to justify a regular clinic staffed jointly by a specialist consultant obstetrician and physician, who provide a defined service to which referrals can be made, and advice sought.
- Demonstrate that care is centred around women, taking into account cultural needs and offering reasonable adjustments to address these, with multi-disciplinary joint consultations and appropriate support from specialist nurses, midwives and anaesthetists.

- Have access to other medical, surgical, fetal medicine, clinical genetics and level 3 neonatal intensive care services where needed.
- Have a pre-pregnancy counselling service to generate a personalised care plan that covers antenatal, intrapartum and postnatal periods. This will include clear instructions for shared care with secondary services where appropriate, including escalation and transfer protocols.
- Have clear guidelines for planned and emergency delivery.
- Be part of a network with distinct pathways to facilitate timely and easy access to specialist advice.
- Have the necessary resources and multidisciplinary expertise to support, if needed, all stages of the care pathway within an appropriate timescale including termination of pregnancy where requested, as well as labour and delivery.
- For postnatal care – provide a written discharge summary and include detailed plans for follow up, return to physician care and contraception, with a plan for future pregnancy if appropriate.
- Take part in regular robust audit which should also include measures of user experience.
- Record care data for all women seen by the service in an electronic patient record (maternity information system including diagnosis codes, which should be submitted monthly as part of the trust's MSDS submission).

5.1 Applicable obligatory national standards

eg NICE Technical Appraisal Guidance, mandatory accreditation requirements.

5.2 Other applicable national standards to be met by commissioned providers

NICE Clinical Guidance and Quality Standards

- Antenatal Care Quality Standard, NICE, 2012
- Antenatal and postnatal mental health, NICE Guidance, 2016
- Caesarean section Quality Standard, NICE, 2013
- Diabetes in pregnancy Quality Standard, NICE, 2016
- Diabetes in pregnancy: management from preconception to the postnatal period NICE Guidance, 2015

- Hypertension in pregnancy Quality Standard, NICE, 2013
- Hypertension in pregnancy: diagnosis and management, NICE Guidance, 2010
- Intrapartum care for women with existing medical conditions or obstetric complications and their babies, NICE Guidance, 2019
- Weight management before, during and after pregnancy, NICE Guidance, 2010
- Standards for the provision of antenatal care for patients with IBD (BSG + BMFMS), <https://www.bsg.org.uk/clinical-resource/standards-for-the-provision-of-antenatal-care-for-patients-with-inflammatory-bowel-disease/>; Selinger C, Carey N, Cassere S, et al. Frontline Gastroenterology Epub ahead of print:. doi:10.1136/flgastro-2020-101459
- Pregnancy and Renal Disease: <https://renal.org/sites/renal.org/files/FINAL-Pregnancy-Guideline-September-2019.pdf>. Publication Date:1 September, 2019
Authors:
 - Kate Wiles, Lucy Chappell, Katherine Clark, Louise Elman, Matt Hall, Liz Lightstone, Germin Mohamed, Durba Mukherjee, Catherine Nelson-Piercy, Philip Webster, Rebecca Whybrow & Kate Bramham
- ACHD: <https://www.england.nhs.uk/wp-content/uploads/2018/08/Congenital-Heart-Disease-Standards-Level-1-Specialist-Surgical-Centres-Adult.pdf>. See section J on pregnancy
- Myasthenia in pregnancy: best practice guidelines from a U.K. multispecialty working group. Norwood F, Dhanjal M, Hill M, James N, Jungbluth H, Kyle P, O'Sullivan G, Palace J, Robb S, Williamson C, Hilton-Jones D, Nelson-Piercy C J Neurol Neurosurg Psychiatry. 2014 May;85(5):538-43. doi: 10.1136/jnnp-2013-305572. Epub 2013 Jun 11.
- Dobson R, Dassan P, Roberts M, Giovannoni G, Nelson-Piercy C, Brex PA. UK consensus on pregnancy in multiple sclerosis: 'Association of British Neurologists' guidelines. Pract Neurol. 2019 Apr;19(2):106-114. doi: 10.1136/practneurol-2018-002060. Epub 2019 Jan 5. PMID: 30612100.
- British Society of Haematology guidelines on sickle cell disease, thrombophilia and AML in pregnancy. <https://b-s-h.org.uk/guidelines/?search=pregnancy>.

Available from the Royal College of Obstetricians and Gynaecologists (RCOG):

- Termination of Pregnancy for Fetal Abnormality in England, Scotland and Wales, RCOG, 2010

5.3 Key performance indicators

Outcomes and equalities

- Rate of maternal mortality and unscheduled admission to ICU with pulmonary oedema due to fluid overload, unrecognised heart disease, acute kidney injury secondary to HELLP (haemolysis, elevated liver enzymes and low platelet count) or acute fatty liver of pregnancy.
- Stillbirths, early neonatal deaths and neonatal unit admissions in women with maternal conditions of sufficient severity to trigger referral for advice or delivery to the MMC.
- All outcome and process indicators analysed and presented according to ethnicity and deprivation defined by IMD.
- Equality of access – ie are women across ethnicities referred to/seen by MMC at an equitable rate?

Process indicators

- Standardised care pathways for all common conditions implemented across MMN footprint.
- Percentage of women in high risk group who are referred for (i) care (ii) opinion to an MMC who have an MDT-produced plan for (as appropriate) antenatal, intrapartum, postpartum contraception care in their notes.
- Are guidelines/standard operating procedures (SOPs) in place across all EDs for identification/referral of red-flag symptoms and who to contact?

Pre-conception

- Access to pre-pregnancy advice in place for all women with chronic conditions?

Acute management

- In all units to demonstrate effective communication between named link physician for maternity and link obstetrician for acute medicine:
 - 1. Proportion of women who are pregnant or <6 weeks postpartum admitted through ED where admission discussed with obstetrician/obstetric physician (from case notes)
 - 2. Proportion of women who are pregnant or <6 weeks postpartum and who have a CT pulmonary angiogram who have evidence of discussion with consultant obstetrician or obstetric physician.

Learning

- The MMN can provide evidence of regular MDT meetings to share learning across the network, to include at least:
 - maternal deaths
 - adverse/serious incidents
 - service-level recommendations in annual MBRRACE reports on maternal mortality.

Service user experience

- The MMN can demonstrate service user co-production of all aspects of MMN function, including a user group that can provide feedback on experience of quality of care, choice, and accessibility?

6. Designated providers (if applicable)

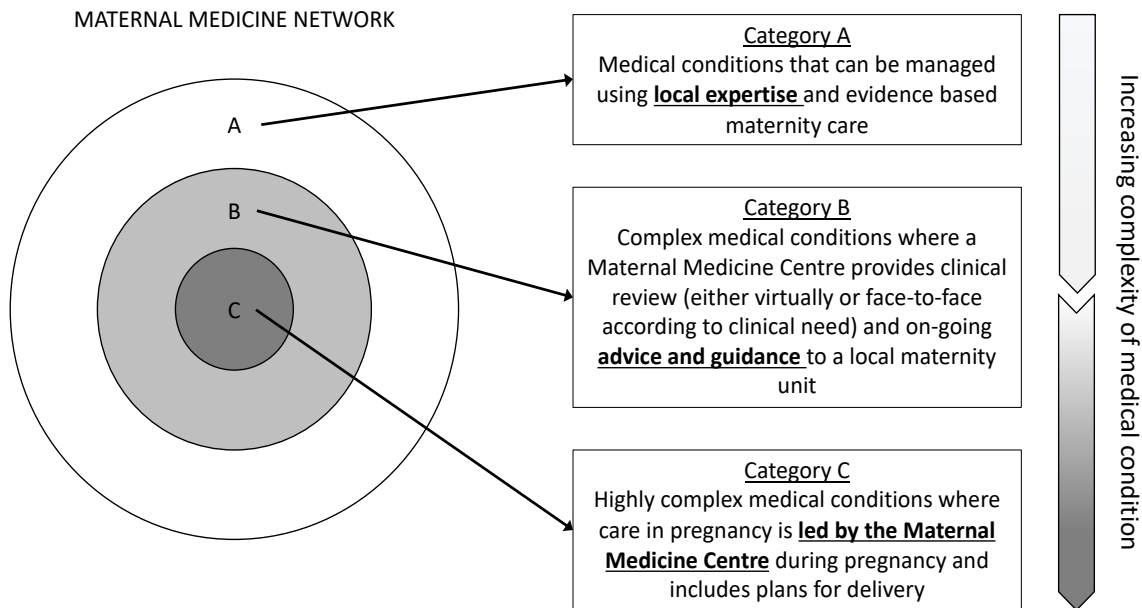
7. Abbreviations and acronyms explained

The following abbreviations and acronyms have been used in this document:

- CCG – clinical commissioning group
- ENT – ears, nose and throat
- LMS – local maternity system
- MMC – maternal medicine centre
- MMN – maternal medicine network
- ODN – operational delivery network
- PPC – pre-pregnancy care
- STP – sustainability and transformation partnership
- TOP – termination of pregnancy.

Appendix 1

Example of indications for referral to maternal medicine centre for opinion or transfer of care, as adopted by the London MMNs (as agreed in May 2021)



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 local.

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:

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
Heart disease		
Mild pulmonary stenosis	Mild reduced left ventricular ejection fraction (>45%)	Pulmonary hypertension
Small/repared patent ductus arteriosus	Hypertrophic cardiomyopathy with no high-risk features	Left ventricular ejection fraction <45%
Mitral valve prolapse	Repaired aortic coarctation	Severe aortic stenosis
Repaired atrial septal defect	Mild mitral stenosis	Systemic right ventricle
Repaired ventricular septal defect	Mild-moderate aortic stenosis	Fontan
Isolated atrial or ventricular ectopic beats	Other valve lesions not listed in A or C	Previous peripartum cardiomyopathy
Postural tachycardia syndrome (PoTS)	Atrioventricular septal defect	Ventricular arrhythmia
	Repaired tetralogy of Fallot	Mechanical valve
	Supraventricular arrhythmias	Moderate-severe mitral stenosis
	Turner syndrome without aortic dilatation	Aortic dilatation
	Treated ischaemic heart disease	Heart transplant
	Myocarditis	New ischaemic heart disease
Lung disease		
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

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
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		
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	

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
Diabetes and endocrine disease		
Gestational diabetes mellitus	Type I and II diabetes mellitus with: <ul style="list-style-type: none"> • Nephropathy (see kidney pathway) • Cardiovascular disease (see heart pathway) 	Primary and secondary hyperaldosteronism
Type I and II diabetes mellitus including diabetic retinopathy	Monogenic diabetes	Phaeochromocytoma or paraganglioma
Hypothyroidism	Thyroid hormone resistance	Cushing's syndrome
Hyperthyroidism and gestational hyperthyroidism	Thyroid cancer	Acromegaly
Thyroid nodules	Macroprolactinoma	Metabolic disorders such as Glycogen storage disorder
Microprolactinoma	Pituitary disease on hormone replacement therapy	Hyperparathyroidism
PCOS	Congenital adrenal hyperplasia	Hypoparathyroidism
Vitamin D deficiency	Dumping syndrome post bariatric surgery	
	Addison's disease	
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	

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
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 biologic treatment	
	Progressive kidney disease in pregnancy	
	Kidney disease on biologic treatment	
Rheumatological disease		
Uncomplicated ⁵ rheumatoid arthritis	Rheumatological disease requiring biologic therapy	Active lupus nephritis (see Kidney Pathway)
Uncomplicated ⁶ 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 ⁷ 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	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	

⁵ Uncomplicated disease requires all of: no lung/kidney/heart/CNS/thrombotic/muscle involvement; controlled on current treatment; no current biological treatments.

⁶ See 5.

⁷ See 5

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
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	

Category A: Local expertise	Category B: Review, advice and guidance from maternal medicine centre	Category C: Care led by maternal medicine centre
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 and Type III
		Transfusion dependent disease

Appendix 2

Service – Health Inequalities Matrix



Dr Bola Owolabi – Director –
Health Inequalities