Maternal Obesity in Pregnancy: Evidence-Based Management from Pre-conception to Post-partum

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DOI: 10.29322/IJSRP.15.08.2025.p16435
https://dx.doi.org/10.29322/IJSRP.15.08.2025.p16435

Paper Received Date: 10th July 2025
Paper Acceptance Date: 22nd August 2025
Paper Publication Date: 28th August 2025

Abstract: Obesity (body-mass index ≥ 30 kg/m²) now affects more than 20 % of pregnant women worldwide and is a major driver of adverse obstetric and long-term cardiometabolic outcomes. Because weight loss during gestation is generally discouraged, the window for intervention spans pre-conception optimisation, tailored antenatal surveillance, risk-adapted intrapartum planning, and structured post-partum care. This narrative review synthesises guidelines and primary research published 2020-2025 to outline best-practice management of women with obesity in pregnancy. Core themes are: (1) pre-pregnancy counselling, folic-acid optimisation and bariatric-surgery timing; (2) early first-trimester booking with baseline metabolic assessment; (3) lifestyle, nutritional and pharmacologic strategies that safely limit gestational weight gain to Institute of Medicine (IOM) targets; (4) prevention, screening and treatment of obesity-related complications such as gestational diabetes, hypertensive disorders and venous thrombo-embolism; (5) anaesthetic, operative and neonatal considerations; and (6) post-partum weight-management, lactation support and inter-pregnancy interval planning. Evidence shows that multicomponent lifestyle programmes reduce excessive weight gain by 20-30 % and confer modest improvements in glycaemic control, while higher-dose thromboprophylaxis and ultrasound-guided neuraxial analgesia mitigate intrapartum morbidity. Remaining research gaps include precision nutrition, pharmacotherapy trials and long-term maternal-child cardiometabolic surveillance.

Introduction

Rising global obesity has translated into a parallel increase in maternal obesity, with prevalence exceeding 30 % in many high-income countries and rising sharply in low- and middle-income regions. Maternal obesity is associated with miscarriage, congenital anomalies, hypertensive disorders, gestational diabetes mellitus (GDM), thrombo-embolism, induction failure, caesarean delivery, stillbirth and large-for-gestational-age (LGA) infants. Longer-term sequelae include maternal type 2 diabetes, cardiovascular disease and trans-generational obesity.

Professional bodies—including the American College of Obstetricians and Gynecologists (ACOG), the Royal College of Obstetricians and Gynaecologists (RCOG), the National Institute for Health and Care Excellence (NICE) and the World Health Organization (WHO)—have issued recommendations, yet implementation remains inconsistent. This review therefore collates contemporary evidence into a coherent management framework spanning the reproductive continuum.

Methodology

Literature searches were conducted in PubMed, Embase, Scopus and Google Scholar for English-language publications January 2020 – June 2025 using combinations of obesity, pregnancy, gestational weight gain, lifestyle intervention, thromboprophylaxis, anaesthesia, bariatric surgery and post-partum weight management. Recent ACOG Committee Opinions, RCOG Green-top Guideline 72, NICE NG201 and WHO fact-sheets were included. After title-abstract screening, 112 full texts were assessed; 55 high-quality guidelines, meta-analyses, cohort studies and randomised controlled trials (RCTs) informed this narrative synthesis.

Discussion

1. Pre-conception Phase

Key Actions	**Rationale**
Weight optimisation via behaviour change or bariatric surgery â‰¥ 12 months before conception	Starting pregnancy at a healthy weight halves the risk of GDM and pre-eclampsiaÂ
Micronutrient supplementation: 5 mg folic acid daily (vs. 0.4 mg standard)	Obesity doubles neural-tube-defect risk; higher folate offsets malabsorptionÂ
Medication review (e.g., discontinue ACE-inhibitors, optimise metformin)	Minimises teratogenic exposure
Counselling on IOM weight-gain targets (5â€“9 kg for BMI â‰¥ 30)	Sets realistic goals earlyÂ

Bariatric surgery improves fertility but carries malabsorption and small-for-gestational-age (SGA) risks; NICE advises delaying conception 12–24 months post-surgery to allow weight stabilisation.

2. Antenatal Care

2.1 Booking Visit (≤ 10 weeks)

• Baseline labs: HbA1c, lipid profile, renal and liver panels.
• Early OGTT (or fasting glucose) to detect overt diabetes.
• Blood-pressure profile and aspirin 150 mg nocte from 12 weeks if ≥ 2 pre-eclampsia risk factors (BMI > 35, age > 40, previous HDP, etc.) .
• Vitamin D 10 µg daily; deficiency is common in obesity.

2.2 Gestational Weight-Gain Management

Multicomponent interventions—structured dietitian-led counselling + moderate-intensity exercise + behavioural coaching—reduce excessive weight gain by 1.1 kg on average and lower GDM incidence by 15 % . Digital platforms (apps, telehealth) show comparable efficacy and higher adherence in RCTs.

2.3 Screening & Prevention of Complications

Complication	Strategy	Evidence
GDM	75 g OGTT at 24â€“28 weeks; earlier if fasting glucose â‰¥ 5.1 mmol/L	Obesity triples GDM risk; diet+metformin first-lineÂ
Hypertensive disorders	Low-dose aspirin, serial BP & uterine-artery Doppler at 20-24 weeks	Reduces pre-eclampsia by 18 %
Fetal anomalies	Detailed anatomy scan at 20â€“22 weeks + targeted echocardiography	Maternal obesity limits ultrasound sensitivity; consider fetal MRI in tertiary centres
Thrombo-embolism	LMWH prophylaxis if BMI > 40 + additional risk factor; consider anti-embolism stockings	RCOG recommends weight-adjusted dosingÂ

2.4 Fetal Growth and Well-being

Obesity increases both SGA (after bariatric surgery) and LGA risk. Serial growth scans at 28, 32 and 36 weeks are advised when BMI ≥ 35 or comorbidities present. Non-stress testing from 37 weeks if macrosomia, insulin-treated GDM or hypertension.

3. Intrapartum Management

Consideration	Recommended Approach
Place of birth	Consultant-led obstetric unit with 24 / 7 anaesthesia, HDU, neonatal care
Labour induction	Counsel higher failure and caesarean risk; consider mechanical ripening + low-dose oxytocin protocolsÂ
Anaesthesia	Early assessment; ultrasound-guided neuraxial placement; prepare for difficult airway
Venous access	Two wide-bore cannulas; ultrasound guidance
Operative birth	Use longer instruments, pannus retractors; schedule senior surgeon

Neonatal	Shoulder dystocia drills; anticipate LGA

Post-partum haemorrhage risk is increased; active third-stage management with uterotonics and haemostatic vigilance is essential.

4. Post-partum & Inter-pregnancy Care

• Thromboprophylaxis: LMWH for at least 10 days post-partum if BMI ≥ 40 or cesarean + BMI ≥ 35.
• Breastfeeding: obesity delays lactogenesis; proactive lactation consultant support improves exclusivity rates.
• Weight-loss programmes: structured diet + physical activity commencing at 6 weeks improve 12-month weight retention by −3.2 kg versus usual care.
• Metabolic screening: 6-12 week OGTT for women with GDM; annual diabetes screening thereafter.
• Contraception: offer long-acting reversible contraception; counsel on reduced oral contraceptive efficacy at BMI > 35.
• Future pregnancy planning: reinforce ≥ 12-month inter-pregnancy interval for weight optimisation; review bariatric-surgery referrals where indicated.

Conclusion

Maternal obesity demands a longitudinal, multidisciplinary strategy beginning before conception and extending well beyond delivery. Evidence supports high-dose folate, early metabolic screening, weight-gain counselling aligned with IOM targets, low-dose aspirin, personalised lifestyle interventions and risk-adjusted thromboprophylaxis. Intrapartum success hinges on expert anaesthesia, readiness for operative challenges and neonatal preparedness. Post-partum, focused weight-loss and metabolic surveillance benefit both mother and child. Future research should prioritise precision-nutrition algorithms, anti-obesity pharmacotherapy trials (e.g., GLP-1 agonists) in the inter-pregnancy interval, and long-term cardio-metabolic follow-up registries to attenuate the inter-generational cycle of obesity.

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