

Prevention of noncommunicable diseases by interventions in the preconception period: A FIGO position paper for action by healthcare practitioners

Chandni Maria Jacob^{1,2} | Sarah Louise Killeen³ | Fionnuala M. McAuliffe³ |
 Judith Stephenson⁴ | Moshe Hod^{5,6} | Ivonne Diaz Yamal^{7,8,9} | Jaideep Malhotra^{10,11} |
 Edgar Mocanu¹² | H. David McIntyre¹³ | Anne B. Kihara^{14,15} | Ronald C. Ma^{16,17} |
 Hema Divakar¹⁸ | Anil Kapur¹⁹ | Rui Ferriani²⁰ | Ernest Ng²¹ | Laurie Henry²² |
 Zephne Van Der Spuy²³ | Zev Rosenwaks²⁴ | Mark A. Hanson^{1,2,*}

¹Institute of Developmental Sciences, Faculty of Medicine, University of Southampton, Southampton, UK

²NIHR Southampton Biomedical Research Centre, University Hospital Southampton, Southampton, UK

³UCD Perinatal Research Centre, School of Medicine, University College Dublin, National Maternity Hospital, Dublin, Ireland

⁴Elizabeth Garrett Anderson Institute for Women's Health, University College London, London, UK

⁵Mor Comprehensive Women's Health Care Center, Tel Aviv, Israel

⁶FIGO Pregnancy and Non-Communicable Diseases Committee, International Federation of Gynecology and Obstetrics, London, UK

⁷Faculty of Medicine, University Militar Nueva Granada, Bogota, Colombia

⁸Fertility Center Procreation Medicamente Asistida, Bogota, Colombia

⁹FIGO Committee for Reproductive Medicine, Endocrinology, and Infertility, International Federation of Gynecology and Obstetrics, London, UK

¹⁰Malhotra Nursing and Maternity Home, Agra, India

¹¹Rainbow Hospital, Agra, India

¹²RCSI Department of Reproductive Medicine, Rotunda Hospital, Dublin, Ireland

¹³Mater Research, The University of Queensland, South Brisbane, Qld, Australia

¹⁴African Federation of Obstetricians and Gynaecologists, Khartoum, Sudan

¹⁵Department of Obstetrics and Gynecology, School of Medicine, University of Nairobi, Nairobi, Kenya

¹⁶Department of Medicine and Therapeutics, The Chinese University of Hong Kong, Hong Kong SAR, China

¹⁷Hong Kong Institute of Diabetes and Obesity, The Chinese University of Hong Kong, Hong Kong SAR, China

¹⁸Divakar's Specialty Hospital, Bengaluru, India

¹⁹World Diabetes Foundation, Bagsværd, Denmark

²⁰Ribeirão Preto Medical School, Human Reproduction Sector, Department of Gynecology and Obstetrics, University of São Paulo, São Paulo, Brazil

²¹Department of Obstetrics and Gynecology, Li Ka Shing Faculty of Medicine, University of Hong Kong, Hong Kong SAR, China

²²Department of Gynecology and Obstetrics, Centre de Procréation Médicalement Assistée (CPMA), University of Liège, CHR de la Citadelle, Liège, Belgium

²³Department of Obstetrics and Gynecology, University of Cape Town, Groote Schuur Hospital, Cape Town, South Africa

²⁴The Ronald O. Perleman and Claudia Cohen Center for Reproductive Medicine, Weill Cornell Medicine, New York, NY, USA

This is an open access article under the terms of the Creative Commons Attribution License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited.

© 2020 The Authors. *International Journal of Gynecology & Obstetrics* published by John Wiley & Sons Ltd on behalf of International Federation of Gynecology and Obstetrics

*Correspondence

Mark A. Hanson, Institute of Developmental Sciences, MP 887, Southampton General Hospital, Tremona Road, Southampton, SO16 6YD, UK.
Email: M.Hanson@soton.ac.uk

Abstract

With the increase in obesity prevalence among women of reproductive age globally, the risks of type 2 diabetes, gestational diabetes, pre-eclampsia, and other conditions are rising, with detrimental effects on maternal and newborn health. The period before pregnancy is increasingly recognized as crucial for addressing weight management and reducing malnutrition (both under- and overnutrition) in both parents to reduce the risk of noncommunicable diseases (NCDs) in the mother as well as the passage of risk to her offspring. Healthcare practitioners, including obstetricians, gynecologists, midwives, and general practitioners, have an important role to play in supporting women in planning a pregnancy and achieving healthy nutrition and weight before pregnancy. In this position paper, the FIGO Pregnancy Obesity and Nutrition Initiative provides an overview of the evidence for preconception clinical guidelines to reduce the risk of NCDs in mothers and their offspring. It encourages healthcare practitioners to initiate a dialogue on women's health, nutrition, and weight management before conception. While acknowledging the fundamental importance of the wider social and environmental determinants of health, this paper focuses on a simple set of recommendations for clinical practice that can be used even in short consultations. The recommendations can be contextualized based on local cultural and dietary practices as part of a system-wide public health approach to influence the wider determinants as well as individual factors influencing preconception health.

KEY WORDS

FIGO; Noncommunicable diseases; Nutrition; Obesity; Perinatal health; Preconception; Pregnancy

1 | BACKGROUND

Definitions of the preconception period vary from "3 months before conception"¹ to "a minimum of 1–2 years before the initiation of any unprotected sexual intercourse that could possibly result in a pregnancy".² More recently, the *Lancet* series on preconception health called for a new definition that considers multiple perspectives: biological (days to weeks before embryo development); individual (weeks to months before pregnancy); and public health (months to years).¹

Preconception care is defined as "a set of interventions that aim to identify and modify biomedical, behavioral, and social risks to a woman's health or pregnancy outcome through prevention and management, emphasizing those factors that must be acted on before conception or early in pregnancy to have maximal impact".³ This includes care provided regardless of pregnancy status or intention.⁴ A limitation in delivering preconception care has been the focus on women and couples motivated to conceive. For example, early marriage and early age at childbirth are common in low- and middle-income countries (LMICs) such as India.⁵ In addition, even in high-income countries, a significant proportion of pregnancies are unplanned: 45% of pregnancies in the UK.⁶ Healthcare professionals often meet women with different perspectives on pregnancy⁷: "potential" (sexually active individuals without effective contraception or contraceptive failure);

"intentional" (men and women making a conscious decision to conceive); and "public health" (a wider range of individuals and couples not sexually active). With the growing realization that efforts to optimize health of women and children should begin before conception, healthcare practitioners must be aware of these perspectives.

2 | PRECONCEPTION HEALTH:
AN OPPORTUNITY TO PREVENT
NONCOMMUNICABLE DISEASES (NCDs)

Globally, there has been a rapid rise in obesity among women of reproductive age, with almost 21% of women in the world predicted to be obese by 2025.⁸ In high-income countries such as the USA, the prevalence of obesity in women aged 20–39 years was 31.8% in 2011–2012.⁹ With the nutritional transition in LMICs, overweight and obesity prevalence is increasing, for example in South Africa, China, and Brazil.^{10,11} Thus, more women now enter pregnancy with excess weight and are subsequently at a higher risk of complications such as pre-eclampsia, gestational diabetes (GDM), and macrosomia, and their children have an increased risk of obesity.¹² Similarly, undernutrition before pregnancy (being underweight or micronutrient deficient) can lead to adverse outcomes such as low birth weight and intrauterine growth restriction, neural tube defects, and preterm delivery.¹³

Box 1. Intermediary risk factors in the time around conception and effects on future noncommunicable diseases (NCDs) in mother and offspring.

Periconceptional risk factors for future NCDs	Perinatal complications	Risk to offspring	Long-term impact on mother and offspring
<ul style="list-style-type: none"> Overweight and obesity Pre-existing diabetes mellitus Smoking Polycystic ovarian syndrome High blood pressure Paternal factors such as suboptimal nutrition Micronutrient deficiencies (e.g. iron, folate, vitamin D) Underweight/undernutrition 	<ul style="list-style-type: none"> Before pregnancy: reduced fertility, pregnancy loss Gestational diabetes Pre-eclampsia, gestational hypertension Preterm birth 	<ul style="list-style-type: none"> Altered birthweight (e.g. low birthweight, small for gestational age, macrosomia) Congenital anomalies (e.g. neural tube and cardiac defects) Increased adiposity in infancy and childhood 	<ul style="list-style-type: none"> Cardiometabolic disorders Neuro-developmental issues Childhood obesity and increased risk of type 2 diabetes/prediabetes Increased risk of type 2 diabetes in mother

Impaired maternal and paternal nutrition in the preconception period can affect embryonic development with long-term consequences for the next generation.¹⁴ Box 1 summarizes key risk factors in the preconception period and maternal and fetal outcomes.^{12,14,15}

Adverse conditions in critical periods before, during, and after pregnancy can have lasting effects on the child's physical and neurological growth and development. This, in turn, can affect future outcomes such as education and economic productivity.¹⁶ Higher preconception body mass index (BMI, calculated as weight in kilograms divided by the square of height in meters) carries a significant risk for excess gestational weight gain in early pregnancy¹⁷ and childhood obesity,¹⁸ perpetuating the intergenerational cycle of NCDs. Growing evidence shows that dietary and lifestyle interventions to reduce excess gestational weight gain and improve birth outcomes may be inadequate.¹⁹ As the challenge to manage maternal obesity intensifies, greater emphasis on prevention is needed and support should be available for weight loss before pregnancy. This can have added benefits for women with subfertility who are trying to conceive, and those with comorbidities such as polycystic ovarian syndrome (PCOS) or pre-existing diabetes.

Preconception interventions and counselling during clinical visits have shown very clear benefit in the prevention of neural tube defects and reducing the risk of fetal alcohol syndrome.^{20,21} Increasing evidence suggests that preconception care can help modify dietary and physical activity behaviors and optimize medical conditions, such as diabetes, and reduce sequelae such as congenital anomalies.^{22,23} Despite this, dedicated preconception clinics are rare in most countries. In addition, as a significant proportion of pregnancies are unplanned, experts and healthcare organizations have called for maximizing routine contact between healthcare practitioners and young women.²² This means that in many cases, the onus for preconception care is on healthcare practitioners who see women in their routine practice, for reasons other than pregnancy planning. Elements of preconception care can occur whenever a healthcare practitioner meets a woman of childbearing age and this would include offering support for pregnancy planning or contraception counselling, and addressing nutrition and weight management.^{22,24,25}

3 | AIM

This FIGO position paper summarizes key evidence and international guidelines from predominant areas of preconception health related to NCDs, nutrition, and obesity. The target audience of the paper includes all healthcare practitioners, healthcare delivery organizations, and public health policymakers. The authors provide a clear set of simple recommendations to increase awareness about the importance of preconception counselling among healthcare practitioners who meet women in the reproductive age group (including obstetricians and gynecologists, general practitioners, midwives, community health workers, pediatricians, nutritionists, etc), irrespective of the reason for the consultation. While this paper focuses on providing recommendations for good clinical practice, FIGO acknowledges that obesity and malnutrition are chronic conditions influenced by lifestyle, health behaviors, public health policies, and other factors outside the clinical domain (i.e. the social and environmental determinants of health).²⁶ This is not a systematic review of all clinical guidelines for preconception care globally. Supporting information S1 provides a list of the available guidelines based on key international documents from maternal health organizations to aid the development of country-specific strategies. We recommend that healthcare practitioners refer to the guidelines presented in Box 2 and contextualize them to their settings for routine practice.

4 | BARRIERS AND OPPORTUNITIES FOR ENGAGING WITH WOMEN IN THE PRECONCEPTION PERIOD

Despite mounting evidence on the importance of the preconception period, the translation of guidelines into clinical and public health practice remains inadequate.^{21,27} Opportunities for preconception care are also underutilized by healthcare practitioners, often due to time constraints during appointments, the lack of resources to discuss preconception care, and competing priorities during a consultation.²⁸ Evaluation of the implementation of guidelines for obesity prevention in the general population has shown that

Box 2. Recommendations for clinicians by the FIGO Pregnancy and Non-Communicable Diseases Committee and the FIGO Committee for Reproductive Medicine, Endocrinology, and Infertility to support the prevention of NCD risk factors in the preconception period.

1. Preconception consultations should include the measurement of height and weight and the calculation of body mass index (BMI, calculated as weight in kilograms divided by the square of height in meters). Where appropriate, all women should be encouraged to attain a BMI as close to the normal range (18.5–24.9) as possible before conceiving.
2. All women who have a BMI greater than 30 should be counselled about the risks of obesity for their health and that of their baby.
3. Women who are underweight before pregnancy (BMI less than 18.5) should be counselled about the risk of being underweight during pregnancy along with the benefits of good nutrition as relevant to their socioeconomic status. Where relevant, women who are underweight should be screened for suspected eating disorders and treated as needed.
4. Counselling for physical activity should be provided when required. Prepregnancy, during pregnancy, and postpartum, where possible, women should exercise moderately for at least 30 minutes a day, 5 days a week, or achieve a minimum of 150 minutes of moderate exercise per week.
5. Clinicians should support women with known pre-existing diabetes to achieve glycemic control (HbA1c <6.5%) before pregnancy along with optimal weight management and dietary advice. When feasible and indicated (e.g. type 1 diabetes mellitus), screening for thyroid dysfunction and coeliac disease should be performed.
6. Chronic conditions such as high blood pressure and polycystic ovarian syndrome should be optimally managed with medication appropriate for pregnancy as required before conception. Women should be counselled regarding the risk of cardiometabolic comorbidities during pregnancy.
7. Folic acid: to ensure protection against neural tube defects, all women of reproductive age are advised to consume 0.4 mg (400 µg) of synthetic folic acid daily, obtained from fortified foods and/or supplements. For all women planning a pregnancy, a dietary supplement of at least 0.4 mg (400 µg) of folic acid per day is recommended at least 1 month before conception and continuing during the first trimester of pregnancy.
8. Women at a higher risk of neural tube defects (e.g. on anticonvulsant medication, with prepregnancy diabetes mellitus, a previous child or family history of neural tube defects, BMI of 30 or greater) wishing to become pregnant should be advised to take at least 4 mg folic acid as a dietary supplement daily, starting at least 1–3 months before conception and continuing during the first trimester of pregnancy.
9. Nutritional deficiencies (e.g. iron, iodine, and vitamin D) should be assessed and treated and advice given as appropriate.
10. Where applicable, discussion on nutritional risks should include the diet and health of the partner too.

recommendations for nutrition and weight loss are not regularly adopted by healthcare practitioners.²⁹ This is influenced by perceptions of the causes of obesity, especially that it results from personal behavioral choice. A negative outlook regarding the effectiveness of behavioral interventions along with the healthcare practitioner's understanding of the scope of their professional responsibility can also influence the delivery of preconception care.^{29,30} Women have reported feeling stigmatized and offended after consultations, especially when the risks of obesity were discussed without offering structured support to address the issue,³¹ and this can lead to healthcare avoidance.³² Lack of planned nutrition discussions during the consultation, low priority for lifestyle and weight management, and a perceived lack of training and skills often hinder healthcare practitioners from discussing weight management, diet, and physical activity with patients.³³ However, healthcare practitioners in maternity services are a group perfectly positioned to discuss preconception nutrition. Though a large proportion of women seek information related to nutrition on the internet, they consider clinicians as reliable sources of information and hence having conversations related to diet and lifestyle in the clinic can help

overcome other barriers such as misinformation and poor-quality nutritional information on the internet.³⁴

Overall, community awareness of the benefit of preconception health and nutrition can be low,³⁰ with most women, especially in LMICs, seeking medical care once they are already pregnant.^{1,13} "Generally healthy" women in the population often do not engage with sexual and reproductive health care or primary care for preconception advice or to discuss pregnancy intentions, thus missing out on important information, increasing unplanned pregnancy and the risk of adverse maternal and fetal outcomes.³⁵ Conversely, it has been reported that women who planned pregnancy were more likely to take folic acid supplementation, access information, and get appropriate immunizations compared to those not planning pregnancy and who had limited healthcare engagement.³⁶

Poor understanding of health issues and a reduced capacity to use health information effectively are additional barriers to effective translation of health messages and adoption of healthy behaviors. To help overcome this issue, studies have suggested that healthcare practitioners utilize clear communication and plain language techniques with all women and their partners who approach them for

nutrition counselling.³⁷ However, to support behavior change, passive provision of information in the hospital setting may not be enough, as seen from multiple weight loss trials.²² Active strategies such as discussion and counselling are suggested, along with techniques such as motivational interviewing and healthy conversation skills, which show promise among healthcare practitioners for inducing lifestyle behavior change.^{38,39}

While several public health models of preconception care delivery have been described, most agree that a patient-centered approach is needed as part of a continuum of care, taking into consideration the woman's socioeconomic circumstances and encouraging the involvement of her partner when suitable.^{1,20} Though dedicated preconception care clinics have great value in improving maternal and fetal outcomes, people attending such services often consist of highly motivated individuals who are planning a pregnancy. Such services also require investment in staff education, time, and resources.⁴⁰ Discussions in antenatal visits are often limited to fetal health and immediate pregnancy outcomes. Including preconception care in routine visits thus provides an opportunity to improve women's overall health and nutrition across the life course using a woman-centered approach.⁴¹ For example, the Before, Between, and Beyond Pregnancy program is the largest preconception health programme in the USA, which aims to make preconception care a standard practice using every encounter with women to address risk factors prior to pregnancy that could influence birth outcomes.⁴² It provides information for patients and includes resources for clinicians on preconception counselling including nutrition, alcohol consumption, screening for obesity, and assessing patient readiness for weight loss.

In summary, FIGO recommends that healthcare practitioners make the most of every contact with women in this period to initiate the conversation about nutrition and weight management using opportunities such as postnatal care, endocrinology and diabetes clinics, and contraception services. Previous reviews have shown that women who received preconception or interconception care had improved outcomes such as increased intake of folic acid and other supplements, lesser gestational weight gain, increased weight loss in the postpartum period, and GDM risk reduction along with reduced risk of small-for-gestational age babies.^{22,23} Summarized below are key NCD, weight, and nutrition-related issues in the perinatal period that could be addressed during preconception visits and clinical guidelines for the same.

5 | ACHIEVING A HEALTHY WEIGHT BEFORE PREGNANCY AND PREVENTING EXCESS GESTATIONAL WEIGHT GAIN

It is estimated that over 50% of women who become pregnant are overweight or obese.⁴³ While antenatal interventions and counselling for appropriate gestational weight gain are crucial, efforts must be made to support women in achieving a healthy weight before and after pregnancy. However, it must be noted that weight loss during pregnancy is not currently recommended. Several national

guidelines have recommended that consultations with women in the preconception period should include a discussion on achieving a normal BMI (18.5–24.9), thus giving them an early opportunity to discuss potential risks and management of weight with a healthcare practitioner.^{44–46} Furthermore, healthcare practitioners are advised to convey the obstetric risks of being under- or overweight during pregnancy. Though improved outcomes are seen after a weight loss of about 5%–10% of original body weight in women with overweight or obesity, goals for weight loss need to be personalized considering the woman's circumstances and any weight loss before pregnancy may be beneficial.⁴⁷ Healthcare practitioners also need to consider the guidelines in their regions while discussing the risks of NCDs. For example, guidelines in some Asian countries have used lower BMI cut-off points than in other populations.⁴⁵ Strategies for improving BMI before pregnancy include behavioral strategies combined with dietary modification and physical activity. An important point for consideration is that improvement in nutrition and physical activity will improve women's overall health and well-being and future pregnancy, even if clinically significant weight loss is not achieved. Overall, evidence is stronger for dietary interventions and diet supplemented with exercise compared to physical activity alone, though the latter has additional cardiovascular benefits.⁴⁸

Bariatric surgery is a recommended treatment for women with marked obesity; however, the BMI cut-offs vary depending on the existence of comorbidities and between countries.^{45,49} Although recommendations for the safe minimal period after metabolic surgery differ, with most guidelines recommending pregnancy at least 12–18 months after the surgery, conception after surgery is best delayed until weight has stabilized.⁵⁰ Being underweight also has adverse obstetric and neonatal outcomes, such as low birth weight, placing the offspring at a higher risk of NCDs in the future.¹⁶ Screening for low BMI must be done where the local prevalence of undernutrition due to infections, food insecurity, and poverty is high. However, women who are underweight should also be screened for eating disorders if suspected and treated as necessary.^{45,51}

It is crucial that risks and strategies for weight loss or gain are communicated in a supportive and nonstigmatizing manner, setting realistic goals for weight management with appropriate referrals to a dietitian/nutritionist when indicated.

Healthcare practitioners should use resources such as the FIGO Nutrition Checklist (supporting information S2) as a tool to address weight in practice,^{52,53} the "Think Nutrition First" guidelines,¹³ and the "Management of Prepregnancy, Pregnancy, and Postpartum Obesity from the FIGO Pregnancy and Non-Communicable Diseases Committee: A FIGO (International Federation of Gynecology and Obstetrics) Guideline" for further information.⁴⁷

6 | NUTRITION AND MICRONUTRIENT SUPPLEMENTATION

A healthy diet before conception may reduce pregnancy complications such as GDM and hypertension.^{54,55} The nutritional guidelines

for women contemplating pregnancy show great diversity between countries and we recommend that local dietary practices based on personal or religious beliefs are taken into consideration when providing nutrition advice. While dietary advice to consume more fruit and vegetables and wholegrains is common across most countries, certain countries have guidelines for particular food items, such as restricting coffee (Italy) and avoiding specific types of fish (Sweden, Italy).⁵⁶

Most countries have guidelines for folic acid supplementation for women planning a pregnancy, and some countries include women not using contraception. Folic acid (at least 0.4 mg daily) should be taken for a minimum of 1 month before conception and the first 3 months of pregnancy. Where there is an increased risk of neural tube defects (anticonvulsant medication, pre-existing diabetes mellitus, previous child or family history of neural tube defects, BMI >30), consideration should be given to using a higher dose (at least 4 mg daily).⁵⁷ However, the guidelines for folic acid may vary in some countries, for example in the UK 5 mg folic acid is recommended for women with a BMI above 30 who are planning pregnancy.⁵¹

Micronutrient deficiencies (folate, iron, and vitamin B12) can result in issues such as anemia, with severe consequences in pregnancy such as spontaneous abortion, low birth weight, and contributing to perinatal and maternal mortality globally.¹³ Routine supplementation of nutrients varies between countries, likely due to differences in diet based on access, availability, and cultural or societal factors. The specific nutritional deficiencies to be evaluated in routine care must therefore be considered in the context of the nutritional status of the relevant population and reviewed based on the healthcare practitioner's practice. In India, for example, approximately one-third of women are vegetarian or have low consumption of meat, poultry, eggs, and fish, placing them at risk of iron and vitamin B12 deficiency.¹³ It is therefore recommended that all women in the preconception period be screened for anemia. In addition, Indian guidelines recommend weekly supplementation with iron (100 mg) and folic acid (500 µg) with deworming medication (400 mg albendazole) for all women in the preconception period.⁴⁵ Dietary iodine supplementation (150 µg) before a planned pregnancy is recommended in Australia and New Zealand.⁴⁹ In countries where there is low habitual intake of vitamin D or where the potential for endogenous production is limited due to location or skin covering, women of reproductive age may have vitamin D deficiency.¹³ This is especially important for women with obesity who are at high risk of vitamin D deficiency due to sequestration of the vitamin in adipose tissue.⁴⁶ Though the evidence as to whether routine vitamin D supplementation improves maternal and offspring outcomes remains inconclusive, we recommend that, when deficiency is suspected, healthcare practitioners advise supplementation as appropriate. Women who have undergone bariatric surgery will require additional supplementation (e.g. vitamin B12, other vitamins, trace elements) and hence screening and treatment must be provided appropriately.⁵⁸ Detailed guidance on micronutrient supplementation in the perinatal period has been published by FIGO's Working Group on Good Clinical Practice in Maternal–Fetal Medicine.⁵⁷

7 | MANAGEMENT OF DIABETES AND PRECONCEPTION PREVENTION OF GDM

FIGO recommends that preconception care should include risk assessment for GDM for all women along with assessment for risk factors such as obesity.⁵⁹ This aims to establish pre-existing or undiagnosed diabetes and initiate timely treatment for optimal glycemic control, as evidence suggests that women seeking preconception medical care and achieving good glycemic control before pregnancy and in early pregnancy have fewer complications such as congenital malformations and perinatal mortality.⁵⁹ Women of childbearing age visiting diabetes clinics, irrespective of pregnancy intention, should be given routine preconception counselling and information on the effective use of contraception and optimal timing of pregnancy.⁶⁰ Dietary advice and weight reduction are also recommended for women with obesity.^{61,62} Women also need to be informed of the risks and complications of GDM, and how these can be reduced. Postpartum follow-up and glycemic evaluation of women with GDM are also of utmost importance.

8 | CHRONIC MEDICAL CONDITIONS BEFORE PREGNANCY

Often women visit healthcare practitioners such as gynecologists and endocrinologists for issues related to subfertility and existing conditions such as thyroid disorders or PCOS. Screening, assessment, and management of such conditions should include evaluation of preconceptional endocrine issues. Women should be screened for hypertension before conception and those with hypertension should be informed about the risks of pre-eclampsia and offered effective contraception if they so choose.^{63,64} Women with PCOS should be screened for hypertension and diabetes and counselled for weight loss before conception (although there are limited data on the benefit of weight loss).⁶³ Similarly, blood pressure should be optimally managed with medications adjusted to those appropriate for pregnancy prior to conception.

In many parts of the world, especially in low-resource settings, repeated exposure to pollutants and toxic chemicals, such as endocrine disruptors, is common.⁶⁵ These can accumulate in the maternal body to affect fetal growth and development. Some chemicals can also affect sperm quality. In these conditions, preconception counselling to limit exposure from potential airborne, food, and water sources is important, linked to wider political initiatives to reduce it.⁶⁶

9 | INCORPORATING PRECONCEPTION CARE INTO ROUTINE MATERNAL AND CHILD HEALTH SERVICES

National preconception care guidelines often provide recommendations without focusing on women with unplanned pregnancies and identifying those at high risk of NCDs.²¹ While evaluation of

screening for risk factors routinely is still needed, preconception care for planning pregnancy and achieving optimum nutrition has been recommended universally for all women and couples to prevent complications and NCD risks.⁶⁷

Ideally, preconception care would comprise risk identification, education, and intervention provided by a range of healthcare practitioners, supplemented by specialist referrals where necessary.⁴⁰ The four approaches for preconception healthcare delivery proposed by de Weerd⁴⁰ include: universal primary care (opportunistic delivery within the primary care context via GPs, pharmacies, and nurses); hospital-based opportunistic care (including interconception care after delivery); specialized preconception care clinics with targeted interventions; and high-risk outreach preconception care.

Providing preconception care is the responsibility of all healthcare practitioners, especially in primary care, and is not limited to clinicians in maternity care. Family physicians and practitioners in primary care can also contribute to good quality preconception care, which is essentially good quality women's health care and is an integral part of primary health care.⁶⁸ Unplanned pregnancies can have adverse health and social consequences for mother and baby and addressing unmet contraceptive needs in routine primary care visits can help women at high risk. To help address reproductive needs of women in every clinical encounter, the Oregon Foundation for Reproductive Health⁶⁹ developed the One Key Question strategy encouraging all healthcare practitioners to ask "Would you like to become pregnant in the next year?" to women in the reproductive age group. Based on the woman's response (Yes/No/ Unsure/OK either way) clinicians are encouraged to initiate a discussion on reproductive needs (preconception care or contraception) and provide appropriate preventive services.⁷⁰ Preconception checklists, handouts, and tools for women explaining preconception care, available for example in the clinic waiting room, can improve preconception consultations.²⁷ The FIGO Nutrition Checklist^{49,50} can be modified for the local context and used to initiate a conversation related to nutrition before pregnancy and for risk assessment. Incorporating preconception care training in the educational curriculum for medical and allied health professions is also imperative.

Furthermore, efforts to tackle malnutrition must not be shouldered by healthcare practitioners alone but must be supported by public health policies for good nutrition, such as food fortification, and community engagement to increase physical activity and improve dietary habits.¹³ Public health policies such as food fortification with folic acid have led to around a 50% reduction in neural tube defects in many countries.⁷¹ Investment in national level community-based interventions for preconception care show promise, such as China's National Free Preconception Health Examination Project, which was expanded to all rural areas nationwide in 2013.⁷² The project included pregnancy planning and healthy lifestyle advice by trained staff and achieved more than 85% coverage of the population. Similarly, specific preconception care clinics have been established in several countries (e.g. Netherlands, Hungary) and their development requires prioritization by public health agencies and governments in other countries.²¹ Such preconception care programs for planning pregnancy and lifestyle modification before conception could be helpful in countries such as

Colombia where there is increasing prevalence of adult and adolescent obesity.⁷³ The Latin American region also has a high adolescent fertility rate (66.5 births per 1000 in those aged 15–19 years, compared to the global average of 46 births per 1000)⁷⁴ and structured preconceptional education is crucial for such unplanned pregnancies.

10 | POSTNATAL AND INTERCONCEPTION CARE

The postpartum period provides a platform for preparing for a possible next pregnancy and identifying women with, or at higher risk of, NCDs such as type 2 diabetes mellitus or GDM, addressing contraceptive needs, reversal of excess gestational weight gain, and addressing nutritional requirements.^{21,75} For example, a study from the USA detected low rates of follow-up glucose testing in women with GDM, especially in the postpartum period (5.8%), although this improved slightly after a year (21.8%) and at 3 years (51%).⁷⁶ Contact with primary care after delivery was also very low. Several experts have called for recognizing the importance of, and providing, continuity of care in the "fourth trimester"⁷⁷ taking into account the mother's physical and mental health in the postpartum period.

Key service providers for infant health such as pediatricians, general practitioners, and health visitors have an important role in discussing interconception health, not only for the next pregnancy but also for the long-term health of the mother. Not addressing these issues before the next pregnancy, especially for mothers with a history of outcomes such as low birthweight or medical comorbidities, is a missed opportunity for improving the woman's health and outcomes of subsequent pregnancies.⁷⁵ FIGO recommends the extension of preconception care into the postpartum stage to increase the window of opportunity and access women with nutritional needs, thus providing an integrated continuum of care for women.^{1,77}

Box 3 summarizes the key recommendations for preconception care in routine care that healthcare practitioners should consider, to support women in improving nutrition, weight management, and lifestyle before pregnancy.

11 | CONCLUSION

The FIGO Pregnancy and Non-Communicable Diseases Committee and the FIGO Committee for Reproductive Medicine, Endocrinology, and Infertility recommend that all healthcare practitioners engage with the provision of systematic advice and support for women's nutrition and weight management in the preconception period in a supportive and nonstigmatizing manner. Addressing the barriers to communication and using tools such as the FIGO Nutrition Checklist to hold effective discussions in short clinical visits can have long-lasting effects for women's health, pregnancy outcomes, and the long-term health of the offspring. Healthcare practitioners should prioritize attention to common comorbidities and nutritional issues in their settings, underpinned

Box 3. Key messages for healthcare practitioners.

1. Preconception care can and should be delivered in *any* clinical or hospital setting, regardless of the initial reason for a hospital visit, and at either an inpatient or outpatient level. Hospital-based and community/home-based opportunistic preconception care is recommended. This includes visits for contraception, immunization, and child health services.
2. A universal approach of discussing good nutritional habits, risks of obesity, and possible benefits of weight loss before pregnancy at every visit to a healthcare practitioner is recommended.
3. Failure to offer systematic advice and support regarding women's nutrition, weight, and related lifestyle behaviors in their childbearing years is a missed opportunity for preventing the intergenerational cycles of obesity and noncommunicable diseases.
4. As there is poor public understanding of the need for pregnancy planning and preparation in many countries, each contact with a healthcare practitioner is an opportunity to engage women in the reproductive age group in thinking about their health and understanding how their current diet, weight, and lifestyle will influence fertility, pregnancy outcomes, and the long-term health and well-being of their children.
5. Education and training of healthcare practitioners must be addressed urgently, to ensure development of skills and confidence in raising nutrition and weight management issues with women, including training for motivational interviewing and "healthy conversation" skills. Healthcare organizations should give attention to the dissemination of clinical guidelines for preconception weight and nutrition management, and developing, using, and adapting simple tools for clinical practice.
6. Interconception care: healthcare practitioners such as general practitioners, pediatricians, and those involved in postnatal care such as home visitors have an important role to play in interconception care (e.g. a follow-up test for HbA1C, weight management, physical exercise, and nutrition advice).
7. Healthcare practitioners should be cognizant of the common nutritional deficiencies of different age groups. When approached by women in the preconception period they should discuss any dietary restrictions and screen and treat nutritional deficiencies following local dietary guidelines. Where applicable, healthcare practitioners in a variety of settings are encouraged to adapt and use the FIGO Nutrition Checklist to initiate conversations on nutrition and weight management during appointments, and to identify women requiring further intervention or referral to a nutritionist or dietitian.

by the FIGO preconception recommendations in this paper, to ensure all women think about nutrition, weight management, and lifestyle after each consultation and feel empowered to make any necessary changes. Other stakeholders such as public health organizations and professional organizations have a key role to play in addressing training needs and ensuring that the recommendations of these guidelines become embedded throughout their organizations.

AUTHOR CONTRIBUTIONS

This position paper was developed by the FIGO Pregnancy and Non-Communicable Diseases Committee in collaboration with the FIGO Committee for Reproductive Medicine, Endocrinology, and Infertility. All authors were involved in the conception and design of the paper. CMJ wrote the manuscript and all authors provided input into the revisions of the manuscript.

ACKNOWLEDGMENTS

CMJ is supported by the European Union's Horizon 2020 LifeCycle Project under grant agreement No. 733206. MH is supported by the British Heart Foundation and the National Institute for Health Research, UK, through the Southampton Biomedical Research Centre. We are grateful to the members of the UK Preconception Partnership. The Preconception Partnership is a coalition of groups representing different aspects of preconception health in women and

their partners, including the Royal College of General Practitioners, the Royal College of Obstetricians and Gynaecologists, the Faculty of Sexual and Reproductive Healthcare, Public Health England, Tommy's Charity, and academics in reproductive and sexual health, obstetrics and gynecology, population health and epidemiology, nutritional sciences, behavioral sciences, and education in schools. It is run with support from UCL Public Policy and Policy Southampton. RCM acknowledges the RGC General Research Fund (14118718).

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

REFERENCES

1. Stephenson J, Heslehurst N, Hall J, et al. Before the beginning: nutrition and lifestyle in the preconception period and its importance for future health. *Lancet*. 2018;391:1830–1841.
2. Dean SV, Lassi ZS, Imam AM, Bhutta ZA. Preconception care: closing the gap in the continuum of care to accelerate improvements in maternal, newborn and child health. *Reprod Health*. 2014;11(Suppl.3):S1.
3. Posner SF, Johnson K, Parker C, Atrash H, Biermann J. The national summit on preconception care: A summary of concepts and recommendations. *Matern Child Health J*. 2006;10(5 Suppl):S197–205.
4. Dean SV, Imam AM, Lassi ZS, Bhutta ZA. Importance of intervening in the preconception period to impact pregnancy outcomes. In: Bhatia J, Bhutta ZA, Kalhan SC, eds. *Maternal and Child Nutrition: The First 1,000 Days*. Nestlé Nutr Inst Workshop Ser. Nestec Ltd., Vevey/S, Vol. 74. Basel, Switzerland: Karger AG; 2013:63–73.

5. Goli S, Rammohan A, Singh D. The effect of early marriages and early childbearing on women's nutritional status in India. *Matern Child Health J.* 2015;19:1864–1880.
6. Wellings K, Jones KG, Mercer CH, et al. The prevalence of unplanned pregnancy and associated factors in Britain: Findings from the third National Survey of Sexual Attitudes and Lifestyles (Natsal-3). *Lancet.* 2013;382:1807–1816.
7. Hill B, Hall J, Skouteris H, Currie S. Defining preconception: Exploring the concept of a preconception population. *BMC Pregnancy Childbirth.* 2020;20:280.
8. Poston L, Caleyachetty R, Cnattingius S, et al. Preconceptual and maternal obesity: Epidemiology and health consequences. *Lancet Diabetes Endocrinol.* 2016;4:1025–1036.
9. Ogden CL, Carroll MD, Kit BK, Flegal KM. Prevalence of childhood and adult obesity in the United States, 2011–2012. *JAMA.* 2014;311:806–814.
10. Ng M, Fleming T, Robinson M, et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: A systematic analysis for the Global Burden of Disease Study 2013. *Lancet.* 2014;384:766–781.
11. Popkin BM, Adair LS, Ng SW. Global nutrition transition and the pandemic of obesity in developing countries. *Nutr Rev.* 2012;70:3–21.
12. Ma RCW, Schmidt MI, Tam WH, McIntyre HD, Catalano PM. Clinical management of pregnancy in the obese mother: Before conception, during pregnancy, and post partum. *Lancet Diabetes Endocrinol.* 2016;4:1037–1049.
13. Hanson MA, Bardsley A, De-Regil LM, et al. The International Federation of Gynecology and Obstetrics (FIGO) recommendations on adolescent, preconception, and maternal nutrition: "Think Nutrition First". *Int J Gynecol Obstet.* 2015;131(Suppl.4):S213–S253.
14. Fleming TP, Watkins AJ, Velazquez MA, et al. Origins of lifetime health around the time of conception: Causes and consequences. *Lancet.* 2018;391:1842–1852.
15. Godfrey KM, Reynolds RM, Prescott SL, et al. Influence of maternal obesity on the long-term health of offspring. *Lancet Diabetes Endocrinol.* 2017;5:53–64.
16. Hanson M. The inheritance of cardiovascular disease risk. *Acta Paediatr.* 2019;108:1747–1756.
17. Samura T, Steer J, Michelin LD, Carroll L, Holland E, Perkins R. Factors associated with excessive gestational weight gain: Review of current literature. *Glob Adv Health Med.* 2016;5:87–93.
18. Voerman E, Vincent WV, Jaddoe MD, Gaillard PR; on behalf of the LifeCycle Project-Maternal Obesity and Childhood Outcomes Study Group. Association of gestational weight gain with adverse maternal and infant outcomes. *JAMA.* 2019;321:1702–1715.
19. Hanson M, Barker M, Dodd JM, et al. Interventions to prevent maternal obesity before conception, during pregnancy, and post partum. *Lancet Diabetes Endocrinol.* 2017;5:65–76.
20. de Weerd S, Thomas CM, Cikot RJ, Steegers-Theunissen RP, de Boo TM, Steegers EA. Preconception counseling improves folate status of women planning pregnancy. *Obstet Gynecol.* 2002;99:45–50.
21. Shannon GD, Alberg C, Naclu L, Pashayan N. Preconception healthcare delivery at a population level: Construction of public health models of preconception care. *Matern Child Health J.* 2014;18:1512–1531.
22. Barker M, Dombrowski SU, Colbourn T, et al. Intervention strategies to improve nutrition and health behaviours before conception. *Lancet.* 2018;391:1853–1864.
23. Jacob CM, Newell ML, Hanson M. Narrative review of reviews of preconception interventions to prevent an increased risk of obesity and non-communicable diseases in children. *Obes Rev.* 2019;20(Suppl.1):5–17.
24. Berghella V, Buchanan E, Pereira L, Baxter JK. Preconception care. *Obstet Gynecol Surv.* 2010;65:119–131.
25. Robbins CL, Gavin L, Zapata LB, et al. Preconception care in publicly funded US clinics that provide family planning services. *Am J Prev Med.* 2016;51:336–343.
26. Marmot M. Health equity in England: the Marmot review 10 years on. *BMJ.* 2020;368:m693.
27. Steel A, Lucke J, Reid R, Adams J. A systematic review of women's and health professional's attitudes and experience of preconception care service delivery. *Fam Pract.* 2016;33:588–595.
28. Mazza D, Chapman A, Michie S. Barriers to the implementation of preconception care guidelines as perceived by general practitioners: A qualitative study. *BMC Health Serv Res.* 2013;13:36.
29. Pearce C, Rychetnik L, Wutzke S, Wilson A. Obesity prevention and the role of hospital and community-based health services: A scoping review. *BMC Health Serv Res.* 2019;19:453.
30. M'hamedi HI, van Voorst SF, Pinxten W, Hilhorst MT, Steegers EAP. Barriers in the uptake and delivery of preconception care: Exploring the views of care providers. *Matern Child Health J.* 2017;21:21–28.
31. Heslehurst N, Moore H, Rankin J, Ells LJ, Wilkinson JR, Summerville CD. How can maternity services be developed to effectively address maternal obesity? A qualitative study. *Midwifery.* 2011;27:e170–e177.
32. Mensinger JL, Tylka TL, Calamari ME. Mechanisms underlying weight status and healthcare avoidance in women: A study of weight stigma, body-related shame and guilt, and healthcare stress. *Body Image.* 2018;25:139–147.
33. McParlin C, Bell R, Robson SC, Muirhead CR, Araújo-Soares V. What helps or hinders midwives to implement physical activity guidelines for obese pregnant women? A questionnaire survey using the Theoretical Domains Framework. *Midwifery.* 2017;49:110–116.
34. Agricola E, Gesualdo F, Pandolfi E, et al. Does googling for preconception care result in information consistent with international guidelines: A comparison of information found by Italian women of childbearing age and health professionals. *BMC Med Inform Decis Mak.* 2013;13:14.
35. Hall JA, Benton L, Copas A, Stephenson J. Pregnancy intention and pregnancy outcome: Systematic review and meta-analysis. *Matern Child Health J.* 2017;21:670–704.
36. Lang AY, Boyle JA, Fitzgerald GL, et al. Optimizing preconception health in women of reproductive age. *Minerva Ginecol.* 2018;70:99–119.
37. Kilfoyle KA, Vitko M, O'Conor R, Bailey SC. Health literacy and women's reproductive health: A systematic review. *J Women's Health (Larchmt).* 2016;25:1237–1255.
38. Christie D, Channon S. The potential for motivational interviewing to improve outcomes in the management of diabetes and obesity in paediatric and adult populations: A clinical review. *Diabetes Obes Metab.* 2014;16:381–387.
39. Lawrence W, Vogel C, Strömmér S, et al. How can we best use opportunities provided by routine maternity care to engage women in improving their diets and health? *Matern Child Nutr.* 2020;16:e12900.
40. Shannon GD, Alberg C, Naclu L, Pashayan N. Preconception healthcare and congenital disorders: Systematic review of the effectiveness of preconception care programs in the prevention of congenital disorders. *Matern Child Health J.* 2014;18:1354–1379.
41. Moos MK. What are the challenges and knowledge gaps for implementing preconception health? Paper presented at the 1st European Congress on Preconception Care and Preconception Health, Brussels, October 6–9, 2010.
42. Before, Between and Beyond Pregnancy [website]. Resources. The University of North Carolina at Chapel Hill. <https://beforeandbeyond.org/resources/>. Accessed July 19, 2020.
43. NCD Risk Factor Collaboration (NCD-RisC). Trends in adult body-mass index in 200 countries from 1975 to 2014: A pooled analysis of 1698 population-based measurement studies with 19·2 million participants. *Lancet.* 1975;2016:1377–1396.
44. ACOG Committee Opinion No. 762; prepregnancy counseling. *Obstet Gynecol.* 2019;133:e78–e89.
45. The Federation of Obstetric and Gynaecological Societies of India. Good Clinical Practice Recommendations on Preconception Care 2016. <https://www.fogsi.org/gcpr-preconception-care/>. Accessed May 15, 2020.

46. Royal College of Obstetricians and Gynaecologists. Care of Women with Obesity in Pregnancy (Green-top Guideline No. 72) Published November 22, 2018. <https://www.rcog.org.uk/en/guidelines-research-services/guidelines/gtg72/>. Accessed May 15, 2020.

47. McAuliffe FM, Killeen SL, Jacob CM, et al. Management of pre-pregnancy, pregnancy, and postpartum obesity from the FIGO Pregnancy and Non-Communicable Diseases Committee: A FIGO (International Federation of Gynecology and Obstetrics) guideline. *Int J Gynecol Obstet.* 2020;151(Suppl 1):16–36.

48. Amorim Adegbeye AR, Linne YM. Diet or exercise, or both, for weight reduction in women after childbirth. *Cochrane Database Syst Rev.* 2013;(7):CD005627.

49. Royal Australian and New Zealand College of Obstetricians and Gynaecologists. Pre-pregnancy Counselling. July 2017. [https://ranzco.org.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20Guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-\(C-Obs-3a\)-review-July-2017_1.pdf?ext=.pdf](https://ranzco.org.au/RANZCOG_SITE/media/RANZCOG-MEDIA/Women%27s%20Health/Statement%20and%20Guidelines/Clinical-Obstetrics/Pre-pregnancy-Counselling-(C-Obs-3a)-review-July-2017_1.pdf?ext=.pdf). Accessed May 15, 2020.

50. Shawe J, Ceulemans D, Akhter Z, et al. Pregnancy after bariatric surgery: Consensus recommendations for periconception, antenatal and postnatal care. *Obes Rev.* 2019;20:1507–1522.

51. National Institute for Health and Care Excellence. Pre-conception - advice and management. November 2019. <https://cks.nice.org.uk/pre-conception-advice-and-management>. Accessed May 15, 2020.

52. Tsoi KY, Chan RSM, Li LS, et al. Evaluation of dietary pattern in early pregnancy using the FIGO Nutrition Checklist compared to a food frequency questionnaire. *Int J Gynecol Obstet.* 2020;151(Suppl 1):37–44.

53. Killeen SL, Callaghan SL, Jacob CM, et al. Examining the use of the FIGO Nutrition Checklist in routine antenatal practice: multistakeholder feedback to implementation. *Int J Gynecol Obstet.* 2020;151(Suppl 1):51–56.

54. Courtney A, O'Brien E, Crowley R, et al. DASH (Dietary Approaches to Stop Hypertension) dietary pattern and maternal blood pressure in pregnancy. *J Hum Nutr Diet.* 2020; [Epub ahead of print].

55. Raghavan R, Dreibelbis C, Kingshipp BL, et al. Dietary patterns before and during pregnancy and birth outcomes: A systematic review. *Am J Clin Nutr.* 2019;109(Suppl.7):729S–756S.

56. Shawe J, Delbaere I, Ekstrand M, et al. Preconception care policy, guidelines, recommendations and services across six European countries: Belgium (Flanders), Denmark, Italy, the Netherlands, Sweden and the United Kingdom. *Eur J Contracept Reprod Health Care.* 2015;20:77–87.

57. FIGO Working Group on Good Clinical Practice in Maternal-Fetal Medicine. Good clinical practice advice: Micronutrients in the periconceptional period and pregnancy. *Int J Gynecol Obstet.* 2019;144:317–321.

58. Busetto L, Dicker D, Azran C, et al. Practical recommendations of the obesity management task force of the European Association for the study of obesity for the post-bariatric surgery medical management. *Obes Facts.* 2017;10:597–632.

59. Hod M, Kapur A, Sacks DA, et al. The International Federation of Gynecology and Obstetrics (FIGO) Initiative on gestational diabetes mellitus: A pragmatic guide for diagnosis, management, and care. *Int J Gynecol Obstet.* 2015;131(Suppl.3):S173–211.

60. American Diabetes Association. 14. Management of diabetes in pregnancy: Standards of medical care in diabetes–2020. *Diabetes Care.* 2020;43(Suppl.1):S183–S192.

61. Mahmud M, Mazza D. Preconception care of women with diabetes: A review of current guideline recommendations. *BMC Womens Health.* 2010;10:5.

62. National Institute for Health and Care Excellence. Diabetes in pregnancy: management from preconception to the postnatal period. NICE guideline [NG3]. Published February 25, 2015. <https://www.nice.org.uk/guidance/ng3>. Accessed May 15, 2020.

63. Goodman NF, Cobin RH, Futterweit W, et al. American Association of Clinical Endocrinologists, American College of Endocrinology, and Androgen Excess and PCOS Society disease state clinical review: Guide to the best practices in the evaluation and treatment of polycystic ovary syndrome-part 2. *Endocr Pract.* 2015;21:1415–1426.

64. Zühlke L, Acquah L. Pre-conception counselling for key cardiovascular conditions in Africa: Optimising pregnancy outcomes. *Cardiovasc J Afr.* 2016;27:79–83.

65. Prüss-Ustün A, Wolf J, Corvalán C, Neira M. *Preventing Disease Through Healthy Environments. A Global Assessment of the Burden of Disease from Environmental Risks.* Geneva, Switzerland: WHO; 2016.

66. Di Renzo GC, Conry JA, Blake J, et al. International Federation of Gynecology and Obstetrics opinion on reproductive health impacts of exposure to toxic environmental chemicals. *Int J Gynecol Obstet.* 2015;131:219–225.

67. Barrett J, Zhou Q-J. Preconception care—East meets West. *Maternal-Fetal Medicine.* 2019;1:65–67.

68. Wilkes J. AAFP releases position paper on preconception care. *Am Fam Physician.* 2016;94:508–510.

69. Frayne DJ. A paradigm shift in preconception and interconception care: Using every encounter to improve birth outcomes. *Zero To Three.* 2017;37:4–12.

70. Oregon Foundation for Reproductive Health. One Key Question: Are You Asking It? <https://www.marchofdimes.org/materials/one-key-question-overview.pdf>. Accessed July 21, 2020.

71. Castillo-Lancellotti C, Tur JA, Uauy R. Impact of folic acid fortification of flour on neural tube defects: A systematic review. *Public Health Nutr.* 2013;16:901–911.

72. Zhou Q, Zhang S, Wang Q, et al. China's community-based strategy of universal preconception care in rural areas at a population level using a novel risk classification system for stratifying couples' preconception health status. *BMC Health Serv Res.* 2016;16:689.

73. Colombian Institute of Family Welfare. ENSIN: National Survey of Nutritional Situation. 2015. <https://www.icbf.gov.co/bienestar/nutricion/encuesta-nacional-situacion-nutricional>. Accessed May 15, 2020.

74. Pan American Health Organization. Latin America and the Caribbean have the second highest adolescent pregnancy rates in the world. 2018. https://www.paho.org/hq/index.php?option=com_content&view=article&id=14163:latin-america-and-the-caribbean-have-the-second-highest-adolescent-pregnancy-rates-in-the-world&Itemid=1926&lang=en. Accessed May 15, 2020.

75. Harrison CL, Skouteris H, Boyle J, Teeude HJ. Preventing obesity across the preconception, pregnancy and postpartum cycle: Implementing research into practice. *Midwifery.* 2017;52:64–70.

76. Bernstein JA, Quinn E, Ameli O, et al. Follow-up after gestational diabetes: A fixable gap in women's preventive healthcare. *BMJ Open Diabetes Res Care.* 2017;5:e000445.

77. Tully KP, Stuebe AM, Verbiest SB. The fourth trimester: A critical transition period with unmet maternal health needs. *Am J Obstet Gynecol.* 2017;217:37–41.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Supporting information S1. Guidelines relevant to nutrition and prevention of obesity and noncommunicable diseases in the preconception period reviewed by the FIGO Pregnancy and Non-Communicable Diseases Committee and the FIGO Committee for Reproductive Medicine, Endocrinology, and Infertility.

Supporting information S2. FIGO nutrition checklist for pre-pregnant/early pregnant women. Reproduced with permission from FIGO.