WISELEAF SCIENTIFIC VENTURES

COMPREHENSIVE PREGNANCY CARE: AN EVIDENCE-BASED MULTIDISCIPLINARY APPROACH

Chapter 1: Preconception Counseling, Family Planning and Pregnancy Preparation

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Abstract

Preconception care is a key element in reproductive health care that aims to improve health of individuals or couples prior to conception. It allows us to recognize and correct medical, dietary, genetic, reproductive, psychological and behavior risk factors affecting fertility, pregnancy and fetal development. This chapter describes the role of preconception consultations, family planning, and pregnancy preparation in the process of making informed reproductive decisions. It studies the issues of medical consultation after marriage, reproductive health examination, knowledge about fertility, genetic counselling, and the application of relevant family planning and contraception methods. This chapter also explains the significance of pregnancy planning through the determination and management of existing health conditions as well as the assessment of medications that need to be taken during pregnancy, spacing between births, age of the mother, and other relevant factors to the aforementioned. Another important thing mentioned in this chapter about pregnancy planning is the fact that women need to take folic acid before conceiving a child. In addition, it is really necessary for women to have a healthy diet, maintain normal weight, do not forget to be physically active, sleep enough, manage stress, and avoid alcohol and drugs. Oral health is also examined. Finally, this chapter explains the roles of medical and healthcare professionals in coordination of preconception care process and states that appropriate counseling is able to minimize risks and ensure healthy pregnancies.

Keywords

Preconception Care, Preconception Counselling, Family Planning, Fertility Awareness, Pregnancy Preparation.

1.1 Introduction

1.1.1 Concept and Importance of Preconception Care

Care before conception encompasses healthcare services provided to individuals and couples prior to conception for the purpose of recognizing and adjusting factors that can negatively impact conception, pregnancy, maternal wellbeing, or fetal health. Care before conception entails looking into medical, dietary, genetic, behavioural, psychological, and other factors influencing the outcome of pregnancy. The preconception period creates all favourable conditions for the detection and control of chronic diseases, examining how medications are taken, identifying nutritional deficits and immunization, and fostering healthy lifestyle behaviours. Thus, provision of quality preconception care can lead to lower risks and better health of parents-to-be and their offspring.[1]

1.1.2 Objectives of Preconception Counselling

The purpose of preconception counseling is to help couples and individuals prepare for a healthy pregnancy by recognizing the probable risks to their health. A preconception evaluation includes reviewing past medical histories and reproductive histories of the individuals in the partnership, identifying diseases and genetic conditions that may affect them and examining the medicines they are taking and their nutritional status. Preconception counseling encompasses a number of health advice, including recommendations on appropriate food intake and taking folic acid supplements, being physically active, controlling body weight, avoiding tobacco, alcohol and drugs. In addition, preconception counseling gives details concerning fertility issues and pregnancy and family planning advice.[2,3]

1.1.3 Importance of Family Planning and Pregnancy Preparation

Family planning helps individuals and couples to take the necessary decisions regarding the timing, number and spacing of pregnancies in line with their reproductive desires, health status and personal circumstances. Proper contraceptive counselling can help to avoid unwanted pregnancies and ensure healthy gaps between pregnancies. Basically, pregnancy planning means that couples should provide their health's optimization, including managing various already-existing diseases, taking proper nutrition as well as folic acid and medications, going to have vaccination, keeping healthy weight, being active physically and avoiding negative substances. Doing all those things properly can help to minimize risks of preventable issues, help foetus grow and provide better maternal and neonatal outcomes. Thus, pregnancy planning and family planning work together when it comes to preconception care. [4]

1.2 Medical Advice after Marriage

1.2.1 Importance of Medical Consultation

A medical consultation post-marriage is a valuable chance for couples to determine their health and discuss their reproductive intentions before conception. Preconception counseling serves to determine the medical, dietary, reproductive, genetic, and lifestyle factors that can affect fertility and pregnancy. [5] During the consultation, the physician may go through the medical and surgical history of both partners, take into account their medications and supplements, family case history, vaccination status, and reproductive history. Potential diseases, such as diabetes, hypertension, thyroid problems, extra weight, anemia, epilepsy, or other chronic diseases can also be diagnosed and treated before a woman becomes pregnant. A couple may also discuss the issue of contraceptive methods if they are not aimed at getting pregnant immediately, and they can also plan the pregnancy, if they're going to have a baby. [6]

1.2.2 Reproductive Health Assessment

Assessment in reproductive health is important in medical advice after marriage, and it should evaluate both partners' health. In women, assessment may include the history of menstruation, menstruation cycle regularity, age of onset of menstruation, possible signs of ovulatory dysfunctions, history of pregnancies, contraceptive methods used in the past, and gynecological diseases in the past or at the present.[7] In men, important factors may be history of reproductive problems, sexual health, genital diseases, exposure to heat or chemical substances, medications, and lifestyle that may influence fertilization. Analysis of family history is useful in order to identify hereditary diseases, recurrent miscarriages, congenital disorders, and conditions requiring genetic counseling. Assessments may include evaluating body weight, state of nutrition, chronic diseases, medications used, immunization, and smoking (alcohol and drug abuse).

1.2.3 When to Seek Medical Advice

Couples are encouraged to seek medical advice before attempting pregnancy, particularly when either partner has an existing medical condition, uses long-term medication, has a significant family history of inherited disease, or has concerns regarding fertility. Preconception consultation is especially important when there has been a previous miscarriage, stillbirth, preterm birth, congenital anomaly, recurrent pregnancy loss, or other significant pregnancy complication.[8]Women with irregular or absent menstrual cycles, severe menstrual problems, pelvic pain, or known reproductive disorders may benefit from evaluation before attempting conception. Men, who have suffered from testicular or genital disorders, have previously experienced reproductive disorders, have had sexual problems or may be at risk of various aspects affecting the health of sperm, may also require a fitness assessment. If infertility is suspected or detected, consultation with a fertility specialist is required. Advice should be

sought from a medical professional if either partner is concerned about medications, vaccinations, nutritional deficiencies, occupational exposure, or other elements of potential importance for conception and gestation.[9]

1.3 Preconception Health Assessment

1.3.1 Medical and Family History

The medical and family history forms an important part of the assessment of preconception health. It helps find different medical conditions that can affect pregnancy, fertility, or the development of the fetus. The medical history must include previous illnesses, chronic medical conditions, surgical procedures, hospital admissions, allergies, and nutritional deficiencies, as well as problems with reproduction and current health. Women must have their menstrual reports, pregnancies, and outcomes, miscarriages, and complications during pregnancy recorded. Men should provide their medical history concerning reproduction and urology. Family history of diseases including diabetes, hypertension, cardiovascular diseases, genetic diseases, congenital defects, recurrent miscarriages, or hereditary disorders should also be collected. Data concerning tobacco, alcohol, drug use, work environment, eating habits, exercise, and exposure to various environmental toxins or other risk factors is also useful for identifying diseases in future parents.[10]

1.3.2 Physical Examination

A physical examination as part of preconception care is performed to determine the health status of potential parents and identify diseases that need treatment before pregnancy. The general examination may include measurement of height, weight, body mass index, blood pressure, and other important diagnostic parameters. The examination should depend on the patient's medical and reproductive histories. Clinical examination of the cardiovascular, respiratory, urinary, and other systems is performed when indicated. Nutritional status and possible presence of anaemia or deficiency of certain vitamins and minerals have to be evaluated. Women may be examined in order to find out about reproductive or gynecological health issues when the signs and medical history require attention. Men may also be transferred to a healthcare specialist if there are questions about reproductive health and urology.[11]

1.3.3 Laboratory Investigations

Laboratory tests performed during preconception care depend upon the medical history and other factors affecting an individual's health. Some common tests include full blood count to detect anemia or other haematological problems, blood grouping and Rh type if needed, and screening for diseases such as diabetes depending on the person. Other tests may be performed if necessary to determine whether there is any infection that could harm pregnancy. More tests may be performed in case there are any relevant medical problems or symptoms, such as tests of kidney, liver or thyroid functions, urine tests or nutrition assessment. Genetic tests may be

offered to people who belong to the group of increased risk according to history, ancestry, outcomes of the previous pregnancies, or any other factors. Exams must be personalized and not performed randomly.[12]

1.3.4 Immunization and Chronic Disease Screening

The evaluation of the vaccination status is an essential component of preconception health care, as various infections that can be prevented through vaccination can negatively impact pregnancy and the developing fetus. The vaccination record needs to be thoroughly evaluated, and vaccines that are recommended for a certain person's age and health condition as well as in compliance with available country guidelines should be administered. In cases when live vaccines need to be given, their timing should be discussed before attempting to conceive. The preconception health care also serves as a chance to identify and manage chronic illness such as diabetes, hypertension, thyroid pathologies, overweight, epilepsy, asthma, kidney diseases, and cardiovascular diseases. Proper treatment of chronic illness may prevent potential complications for both the mother and the fetus during pregnancy. Patients with chronic diseases may need to alter their treatment plan, increase their monitoring, get nutritional consultations, or get referred to a specialist.[13]

1.3.5 Medication Review

Before conception, it's fundamental to perform an appropriate medication review because certain prescription medications, non-prescription products, vitamins, and herbal products can have an effect on fertility, pregnancy, or fetal development. Therefore, the healthcare provider should review all prescriptions used by both partners considering the corresponding indications, doses, durations of therapy, potential reproductive risks, as well as the safety in pregnancy.If drugs identified as potentially risky must be stopped, this should not be done suddenly. A review of medication needs to be conducted at all times under the supervision of a healthcare provider, and if applicable, a different medication prescription may be made. Intake of nutritional supplements needs to be reviewed, too, so that the woman does not take excessive amounts of things that provide no benefit. As mentioned in [Table1] it is essential to pay special attention to medication prescribed for chronic diseases in preventing complications during pregnancy.

Table 1: Components of Preconception Health Assessment

Component	Key Areas to Assess
Medical History	Chronic illnesses, previous surgeries, reproductive and obstetric history, and previous pregnancy complications
Family History	Genetic disorders, congenital anomalies, inherited diseases, and recurrent pregnancy loss

Physical Examination	Height, weight, BMI, blood pressure, and general physical health
Laboratory Investigations	Relevant blood and urine tests, nutritional status, and investigations based on individual risk factors
Immunization	Previous vaccination history and vaccines recommended before pregnancy
Chronic Disease Screening	Diabetes, hypertension, thyroid disorders, and other relevant chronic conditions
Medication Review	Prescription and OTC medicines, supplements, and herbal products for pregnancy safety
Lifestyle Assessment	Diet, physical activity, tobacco, alcohol, substance use, sleep, stress, and environmental exposures
Oral Health	Dental caries, gingivitis, periodontal disease, and oral hygiene

1.4 Fertility Awareness and Reproductive Planning

1.4.1 Understanding Fertility and Ovulation

Fertility is the biological ability of a person to get pregnant. For women, fertility is linked to the process of ovulation whereby an egg is released from a mature ovary and can be fertilized by sperm. Ovulation takes place once every menstrual cycle but there are different timings for different individuals and for different cycles. After ovulation takes place, the capabilities of the egg to be fertilized last only for a certain period of time but sperm can remain viable inside the female reproductive system for several days at optimal conditions. Thus, knowledge about the menstrual cycle and ovulation and reproductive physiology can be beneficial for couples in terms of the identification of the periods when they could conceive a child as well as help them plan pregnancy in an informed fashion.[14]

1.4.2 Fertile Window

The fertile window refers to a time during the menstrual cycle when having sexual intercourse has the highest chance of resulting in conception. This period includes the days before ovulation as well as a few days post-ovulation because sperm can survive for many days but the egg is viable for only for a short while. The exact time of the fertile window varies according to the characteristics of each specific woman's menstrual cycle. Couples who want to get pregnant often use different approaches for tracking their fertility such as tracking their menstrual cycles, assessing changes in cervical fluid, keeping track of their body temperature and using ovulation predictor kits, for example. The use of several fertility signs may increase the chances of making correct predictions. Nonetheless, predicting the fertile window based on the menstrual cycle may be more difficult for women with irregular cycles.[15]

1.4.3 Factors Affecting Fertility

As mentioned in [Table2] Fertility may be affected by a combination of biological, medical, lifestyle, environmental, and age factors in either partner. For a woman, age, ovulatory disorders, reproductive tract problems, endometriosis, previous pelvic inflammatory disease, and some endocrine or metabolic diseases might play a role in fertility. [16]A man may suffer from abnormalities in sperm production, motility, and/or structure, endoctrine disorders, reproductive organ issues, etc. at the same time as both partners being subjected to the impact of certain lifestyle choices as smoking, alcohol abuse, drug use, overweight/underweight, poor diet, lack of exercise, and serious stress. Furthermore, certain working conditions, such as high temperature and presence of particular chemicals and toxins, can have a negative impact on fertility too.[17]

1.4.4 Fertility Evaluation

When a couple faces challenges in having a child, fertility evaluation may be necessary, especially if there are specific factors that may lead to infertility. A fertility evaluation involves both partners addressing the fact that infertility can originate from male, female, or unknown factors.[18] Completing thorough Medical, Reproductive, Menstrual, Sexual, and family history would be followed by relevant physical examination and sometimes specific tests. Evaluation is done in women to assess ovulation, hormonal levels related to ovaries and reproductive tract structures in relevant cases, while assessment in men is mainly concerned with sperm analysis to measure its concentration, motility, and morphology. Chemistry, imaging, genetic analysis, and some other special tests are performed depending on the condition observed. It is important to perform evaluation quickly if infertility risk factors and irregularities in menstruation or any prior reproductive problems are present.[19]

Table 2: Factors Affecting Fertility in Men and Women

Factor	Examples / Effects on Fertility
Age	Increasing age may reduce fertility, particularly due to declining ovarian reserve and egg quality in women.
Ovulatory Factors	Irregular or absent ovulation and hormonal disorders can reduce the likelihood of conception.
Reproductive Disorders	Endometriosis, tubal abnormalities, pelvic infections, and other reproductive conditions may affect fertility.
Male Factors	Reduced sperm count, motility, or morphology and certain reproductive or hormonal disorders may impair fertility.
Chronic Diseases	Diabetes, thyroid disorders, obesity, and other chronic conditions may affect reproductive function.
Lifestyle Factors	Smoking, alcohol use, recreational drugs, poor diet, physical inactivity, and excessive stress may adversely affect fertility.

Body Weight	Both underweight and overweight/obesity may interfere with reproductive and hormonal function.
Medications	Certain medicines may affect reproductive function or fertility and should be reviewed before conception.
Environmental & Occupational Exposure	Pesticides, chemicals, heavy metals, radiation, excessive heat, and other occupational hazards may affect reproductive health.

1.5 Genetic Counselling

1.5.1 Family History and Genetic Risk

A comprehensive family history is an essential element of preconception care. This is due to the fact that specific genetic and hereditary diseases can be passed on from one parent to the child. Where possible information about the presence of genetic diseases, congenital abnormalities, intellectual or developmental disorders, transmittable blood disorders, repeated loss of pregnancy, unexplained death of infants, etc. in the blood relatives should be collected. [20]The family history must cover both mother's and father's relatives and it may include data about the presence of consanguinity, especially in those families or populations where it is a common practice. The genetic risk can sometimes depend on such factors as age of the parents, previous pregnancy results, carrier status, and particular diseases or ethnicities connected to hereditary conditions. Identifying possible risk factors at the preconception stage can help conduct proper genetic counseling and testing for the carriers and any other necessary examination. That is why a person with good family history can be more prepared for the reproductive process.[21]

1.5.2 Carrier Screening

Carrier screening is used in genetic testing to discover people that may carry a mutated gene for a certain inherited disease without actually showing any symptoms. The screening is helpful when dealing with autosomal recessive or X-linked diseases. [22]Carrier screening may arise depending on the family history of an individual, known carrier status, ethnicity and/or population risk, degree of consanguinity, and reproductive intentions. Genetic counseling would become necessary for couples who had both confirmed being carriers of the same autosomal recessive disease as there might be some risks in regard to the birth of an affected child. Carrier screening can take place either before conception or, occasionally, while an individual is pregnant. Carrier panels can cover both specific diseases or more comprehensive screenings. Preconception screening lets partners have more time to figure out their options after the results are received.[23]

1.5.3 Prenatal Genetic Testing

Prenatal genetic testing signifies different procedures that are conducted while pregnant to find out the chances of having a chromosomal or genetic disorder. The test might include non-invasive tests like ultrasound and analysis of free fetal DNA in the mother's blood as well as invasive tests like chorionic villus sampling or amniocentesis, depending on the case. Screening tests indicate the chances of a specific disorder occurring while diagnostic tests help in determining the presence of a certain genetic disorder. The choice of the kind of test to be used depends on the factors such as the age of the mother, family background, whether any previous pregnancy had a genetic disorder, carrier status of the parents, results of the ultrasound and preferences of the patients. It is highly important that prenatal genetic testing is accompanied by the proper counsel so that a couple understands the purpose, advantages, disadvantages, and potential results of the test before making a decision.[24]

1.5.4 Role of Genetic Counselling

Genetic counselling provides people and couples with information regarding genetic diseases, risks, testing possibilities, and reproductive outcomes. Genetic counselling is conducted by a genetic counsellor or other qualified personnel who evaluates family and individual history, and provides details of the importance and drawbacks of genetic testing.[25] Genetic counselling helps couples make sense of carrier screening findings, choices of prenatal tests, and implications for results of different types. In cases of increased genetic risk, patients may be advised to undergo genetic testing, consult the expert, or carry out other steps related to reproduction. So, genetic counselling plays an essential role in preconception and reproduction, at least for people with an existing genetic risk or people with a history of pregnancy with a genetic or congenital disease.

1.6 Family Planning Methods

1.6.1 Temporary Methods

Temporary contraceptive methods are those that stop pregnancy for a limited period of time during which fertility is restored on stopping the use of the methods. They are ideal for people or couples who want to postpone pregnancy for some time, want to synchronize pregnancies, or have not decided about their reproductive plans. Temporary methods include barrier methods like male and female condoms, hormonal methods such as combined oral contraceptives, progestin-only contraceptive pills, injectables, implants, and intrauterine contraceptive methods. Emergency contraceptive methods may also be considered in case of unprotected intercourse or contraceptive failure to minimize risks of unintended pregnancy. The choice of contraceptive method varies according to factors such as effectiveness, usage period, health status, side effects, convenience, reversibility, cost, and preferences. Condoms also provide

protection from sexually transmitted infections, which is an added benefit that many other contraceptive methods cannot provide.[26]

1.6.2 Permanent Methods

Permanent family planning techniques are aimed at individuals or couples who have achieved the desired size of their family and do not plan to have additional children. The major permanent techniques involve female sterilization, which may include tubal occlusion and tubal ligation. Male sterilization procedures are done by means of vasectomy. These methods block the sperm and the ovum from meeting and can be considered very efficient if performed properly. Since permanent contraception is meant to be irreversible or hardly reversible, people need to have appropriate counseling before choosing these methods. Counseling should provide detailed information about effectiveness of the procedure, complications involved, other long-acting reversible methods available, as well as possible changes in relation to reproductive preferences in the future. Permanent methods do not eliminate STIs, so condoms may be preserved if one needs protection against STIs.[27]

1.6.3 Natural Family Planning

Natural family planning techniques are commonly known as fertility-awareness strategies that assist people in figuring out their fertile and infertile periods and thus allow for avoiding or achieving pregnancies without the need for artificial contraceptives. The methods applied in natural family planning techniques could either be cycle-tracking, cervical mucus-monitoring, basal body temperature-observing or a combination of several fertility indicators. While couples wishing to avoid conception can abstain from unprotected sexual contact or use barrier devices during the fertile period, couples wishing to conceive can use the identified fertile periods for conception. Overall, the success of the method is strongly dependent on the accuracy of observations, the correct interpretation of the signs of fertility, constant observation of the signs of fertility and strict following the practices. However, it is possible that the effectiveness of natural family planning methods is decreased in women with irregular menstrual cycles or when other factors influencing fertility signs are present. Therefore, effective education and counseling of people are needed.[28]

1.6.4 Selection of an Appropriate Method

The choice of a family planning technique should be personal and dependent on the reproductive aims, health state, preferences, and situations of the person or couple in question. Significant points of consideration are the selected duration of birth control, effectiveness, reversibility, age, health conditions, usage of medicine, past experience with contraceptives, possible side effects, the breastfeeding state, the risk of STI, availability, and future plans. It is desirable for medical specialists to provide objective information about the pros and cons, efficiency, and possible adverse effects of methods. One method may not be appropriate for

everybody, and even if the individual chooses one method, this method may vary over time due to changes in reproductive aims and health conditions.

1.7 Contraceptive Approaches

1.7.1 Barrier Methods

As shown in [Figure1] Barrier methods work against conception essentially by creating a physical barrier that prevents sperm from reaching the ovum. Barrier methods usually include male condoms, female condoms, diaphragms, and cervical caps. The reason for the popularity of condoms is that they are easy to obtain, work without hormones, and can be used at any convenient time. Moreover, condoms offer protection against a whole range of sexually transmitted infections, whereas some other methods do not. The absence of systemic hormonal action and immediate return of fertility after stopping the use make these methods of contraception very effective. The barriers can be used correctly to prevent unwanted pregnancies. However, using the barrier improperly or using a broken barrier can reduce the contraceptive effect.[29]

1.7.2 Hormonal Contraceptives

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1.7.3 Intrauterine Devices

Intrauterine devices (IUDs) are small contraceptive devices placed inside the uterus by a trained healthcare professional. They are available mainly as copper-bearing IUDs and hormonal intrauterine systems. [32]Copper IUDs release copper ions that interfere with sperm function and fertilization, while hormonal systems release a progestin that primarily thickens cervical mucus and produces local effects within the uterus. IUDs provide highly effective, long-term contraception and can be removed when pregnancy is desired, after which fertility generally returns rapidly. Copper IUDs are hormone-free and may remain effective for several years depending on the specific device, whereas hormonal systems provide contraception for a specified duration based on the product. Some users may experience changes in menstrual bleeding, cramping, or discomfort, particularly during the initial period after insertion. IUDs

do not protect against STIs, and appropriate counselling regarding STI prevention and follow-up is important.[33]

1.7.4 Emergency Contraception

Emergency contraception is a method that helps lower the chances of conception after unprotected sex or contraceptive failure. It's important to note that this method should be used on an occasional basis, rather than a substitute for regular contraceptive. The types of emergency contraceptives can include: oral contraceptive pills containing (levonorgestrel and ulipristal acetate); on the other hand, you can use a copper IUD if it is used in a given timeframe. Emergency contraceptive pills work by delaying or inhibiting the process of ovulation, thus working best when consumed as soon as possible after unprotected sexual intercourse.The copper IUD is the most effective emergency contraceptive option and can provide ongoing contraception after insertion.[34] Emergency contraception does not terminate an established pregnancy and does not protect against STIs. Individuals who frequently require emergency contraception should be offered counselling regarding suitable regular contraceptive methods.[35]

1.7.5 Long-Acting Reversible Contraception

Long-acting reversible contraception (LARC) includes contraceptive methods that provide prolonged pregnancy prevention without requiring frequent user action while allowing fertility to return after discontinuation. [36]The major LARC options are contraceptive implants and intrauterine contraceptive methods, including copper IUDs and hormonal intrauterine systems. The aforementioned methods are regarded as among the most successful reversible contraceptive choices since their effectiveness relies less on their correct following and daily use. They may be especially appropriate for people who need reliable contraception for many years but may want to conceive later. The duration of the effect differs from method to method and from one product to another. Pre-insertion and post-removal procedures, expected alterations in the menstrual cycle, and possible drawbacks should be included in the counseling.[37]

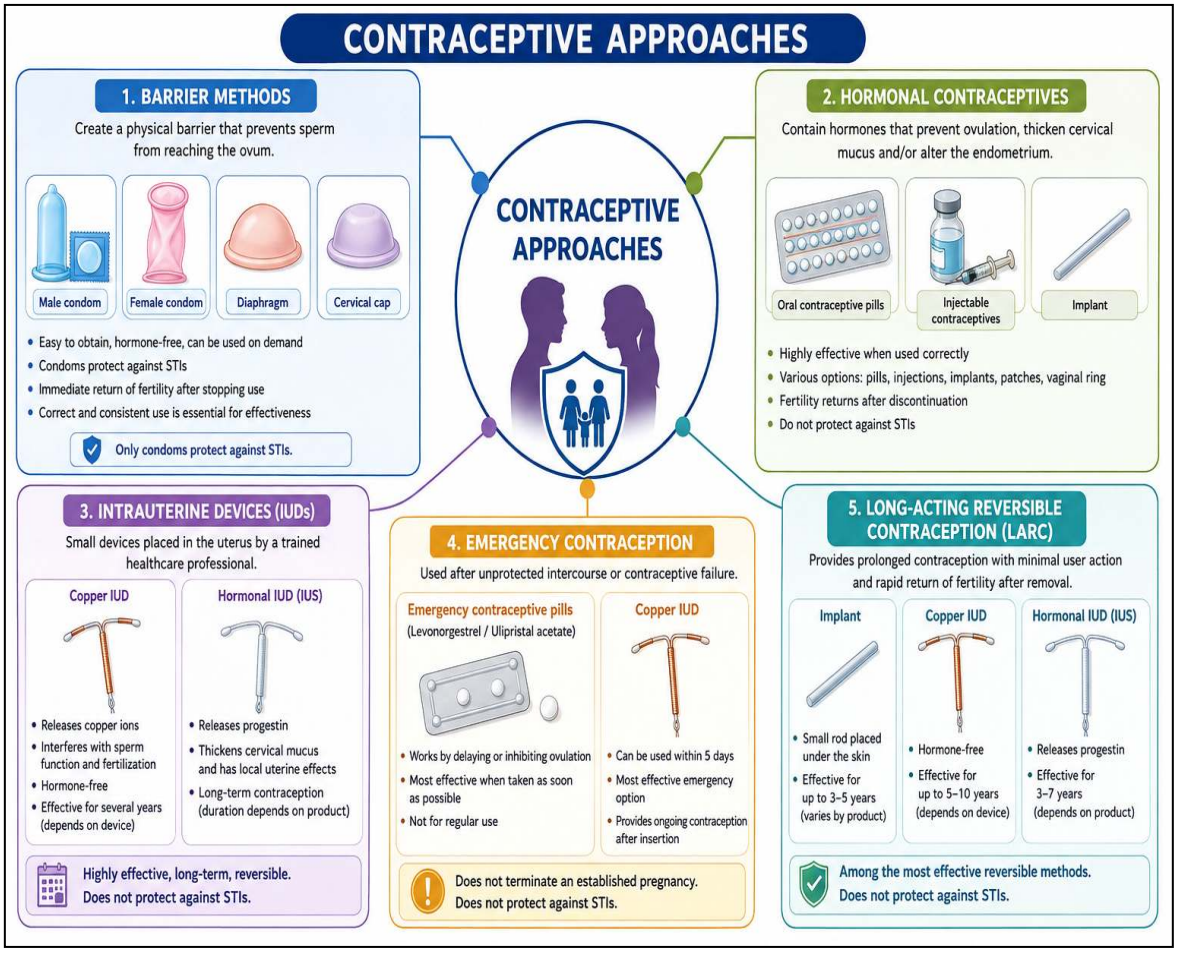


Figure 1: Overview of contraceptive approaches

1.8 Pregnancy Planning

1.8.1 Timing of Pregnancy

The process of planning for pregnancy involves determining the ideal timing for a couple to conceive a child based on their physical well-being, a couple's individual circumstances, and the strategies aimed at reaching their reproductive goals. Pregnancy typically takes place when a couple is in good health, has had various vaccinations, has met its nutritional needs, and has taken the necessary precautions in view of some medication and other aspects which need to be considered. Couples should also think about other matters related to fertility, such as the age of the mother and the peculiarities of her menstrual cycle. Pregnancy counseling will help in identifying relevant dangers and planning the pregnancy.

1.8.2 Maternal Age and Pregnancy

When it comes to planning for pregnancy, maternal age plays a crucial role because every aspect of reproduction is affected by aging. Female fertility tends to decrease gradually with age, which means that it decreases significantly during the reproductive years, partly due to some factors affecting egg quality and the ovarian reserve. Older mothers are therefore more vulnerable to certain pregnancy complications and chromosomal disorders. The young mothers, especially those in their teenage years, may be at risk due to their nutritional and obstetric issues. Therefore, maternal age should be assessed in the context of women's health, reproductive past, individual circumstances, etc. Proper preconception evaluation and counseling are key to defining the effect of age-related issues.[38]

1.8.3 Management of Pre-existing Conditions

Existing medical issues must be evaluated and well managed prior to pregnancy, because poorly managed medical problems may have a negative impact on maternal health and pregnancy results. Diseases such as diabetes, hypertension, thyroid diseases, epilepsy, asthma, obesity, kidney diseases, heart diseases, and other chronic diseases may need certain pre-conception treatment. The health care provider must evaluate disease control, check the treatment that is being used, recognize any possible issues, and state if any medication or treatment adjustments should be performed. People with complicated or dangerous diseases may need specially coordinated medical service, that involves specialists' help. Proper disease management prior to conception can lower incidence of avoidable complications and make pregnancy safer.

1.8.4 Medication and Supplement Review

One of the key aspects of preparing for pregnancy is evaluating medications because many of them can impact fertility, embryo implantation, fetal growth, and pregnancy outcome. All current prescription medications, OTC products, vitamins, minerals, herbal products, and other supplements should be evaluated, as some of the medications may potentially present risks in pregnancy. In addition to reviewing the medications, any drug which has been found to be risky during the course of pregnancy should be discussed with the health care worker, and, if necessary, replaced with a safer medicine. At the same time, one should never stop taking the essential medicines unless the doctor approved of this step, which is important considering the fact that certain illnesses or conditions can also be serious during pregnancy. In regards to vitamins, one of the most relevant topics is the intake of folic acid before conception. This way, having a good overview of the current medications, the specialist will be able to continue safe treatment without any unwanted hazards while the preparation for pregnancy goes on, and help his patient avoid unnecessary problems.

1.8.5 Birth Spacing

Birth spacing is the period between one birth to the next birth. Adequate spacing allows the mother to recover from pregnancy in terms of health and nutrition, as well as address various medical issues, breastfeeding-related demands, and family conditions. [39]Very short periods between pregnancies might lead to higher chances of negative maternal and neonatal consequences. However, the right period is individual. Family planning and appropriate contraceptive counseling can help couples determine when to plan their next pregnancy. In order to define the optimal interval, practitioners should consider such factors as maternal age, pregnancy history, method of delivery, breastfeeding, nutrition, medical history, and reproductive plans.[40]

1.9 Folic Acid Supplementation Before Conception

1.9.1 Importance of Folic Acid

Folic acid is a man-made form of folate, which itself is defined as a soluble vitamin of group B. The role of this vitamin is crucial, as it takes part in the processes of forming DNA, multiplying cells, and producing red blood cells.Sufficient amount of folate in the body becomes evident especially during the pre-conception period and early pregnancy as it is crucial for rapid cell division and tissue formation during this period. Folic acid intake in the prenatal period helps minimize the chances of neural tube defects, such as spina bifida and anencephaly. Since formation of neural tube takes place right at the earliest pregnancy stages, it is necessary to take sufficient amounts of folic acid before conception. Folic acid intake also combats folate deficiency and megaloblastic anaemia. Thus, it follows that provision of sufficient amounts of folate is crucial in ensuring pre-conception care and preparation of pregnancy.[41]

1.9.2 Dosage and Timing

For average risk individuals, a recommendation of 400 micrograms of folic acid on a daily basis is suggested to begin one month prior to the start of pregnancy and continuing after this point until 12 weeks into the pregnancy. It is important to start using supplements prior to conception so that the closure of the neural tube may occur according to schedule. However, it is important to mention that folate-rich products should also be consumed. Folic acid can be consumed either separately or as part of a combination product depending on the nutritional needs of an individual.

1.9.3 High-Risk Pregnancies

Some individuals have an elevated possibility of experiencing a pregnancy complicated by a neural tube defect and would likely require an elevated dose of folic acid with the guidance of a physician. Important risk factors include a previous pregnancy complicated by a neural tube

defect or certain maternal medical conditions such as diabetes, use of some drugs that affect the absorption of folic acid, and certain malabsorption disorders. In these cases, high-dose folic acid (usual 5 mg/day doses of folic acid) may be prescribed by the health professional, beginning before conception and continuing through the early stages of the pregnancy. Individualized doses and durations should be established based on particular risk factors involved and the current guidelines. High-dose supplementation should not be self-prescribed and those with risk factors must seek professional health preconception advice.

1.9.4 Dietary Sources

Dietary folate occurs naturally in a range of foods and is an essential component in maintaining adequate folate levels prior to and throughout pregnancy. Dark green leafy vegetables are one of the most significant sources of folate, but other good sources comprise legumes (including lentils, chickpeas and beans); citrus fruits; avocado; nuts; seeds; and certain whole-grain foods. Fortified foods, which refer to different kinds of cereals and grain products that are fortified in accordance with local fortification practices, also provide folate. Having a diverse and balanced diet including vegetables, fruits, legumes, whole grains and other foods rich in nutrients contributes to overall health during the preconception period. However, considering that one can hardly get enough of folate needed for neural tube defect prevention from the diet, folic acid supplementation is an important aspect of preconception care.

1.10 Lifestyle Modification for Healthy Pregnancy

1.10.1 Healthy Diet and Body Weight

As shown in [Figure2] eeping a good diet and having a good body weight is an important element of preconception care. A good diet must include sufficient energy, protein, essential fatty acids, vitamins, minerals, and other elements that are necessary for reproductive health and pregnancy. [42]Eating different kinds of vegetables, fruits, whole grain, legumes, dairy products or their substitutes, nuts, seeds, and other foods with high nutritional value on a regular basis helps to fulfill the need for nutrition. Special attention should be paid to the elements such as folate, iron, iodine, calcium, vitamin D, and vitamin B12 according to individual dietary needs. Both a low body weight and high body weight or obesity has a negative impact on fertility and pregnancy. That is why it is important to advise people who are going to get pregnant to have a good body weight due to following a healthy diet and doing regular physical exercises. Weight maintenance should be a gradual and individually tailored process especially in case if the person has any deficiencies in nutrition or has any health issues.[43]

1.10.2 Physical Activity

Routine physical activity prior to conception contributes to good physical condition, assists in maintaining normal body weight, and can also bring some positive influences on metabolism

and heart and blood health. Those planning pregnancy should regularly engage in moderate physical activity depending on their health and fitness levels. Making walking, swimming, walking, performing some strength exercises, and exercising for flexibility part of their daily routine is advisable. Those who have not been physically active should increase the amount of exercise slowly, without going into intense physical activity immediately. Moreover, those suffering from chronic diseases, severe obesity, and other health problems may need a healthcare provider's specialized advice. Low levels of physical activity or very intense vigorous workouts connected with energy deficit may be associated with hormonal disorders and reproductive problems, among other things.

1.10.3 Tobacco, Alcohol and Substance Avoidance

Staying away from the use of tobacco, alcohol and recreational drug consumption is a crucial part of preparation for pregnancy. Tobacco exposure, via smoking or being around smokers, has been found to cause negative impacts on fertility and pregnancy outcomes and could impair the development of the fetus. Alcohol consumption during pregnancy could negatively affect the fetus, which is why individuals who are planning pregnancy are recommended to refrain from using the substance. The use of other recreational drugs or misuse of prescribed or other substances also has a negative effect on reproduction and pregnancy. Therefore, exposure to these substances should be evaluated as part of preconception counseling sessions, and individuals who need help in quitting such substances should be provided with help and referrals.

1.10.4 Sleep and Stress Management

Sufficient sleep as well as efficient stress management helps achieve successful physical and psychological well-being during the preconception period. Stable sleeping patterns and adequate restorative sleep help maintain healthy metabolic, hormonal, and emotional functioning. Men and women are advised to create stable sleep habits, reduce the usage of electronic devices before going to bed, and make the sleeping environment as comfortable as possible. The need for dealing with constant psychological stress, anxiety, and emotional problems should not be underestimated. Relaxation techniques, mindfulness, breathing exercises, physical exercises, service of social support, and other positive strategies for coping with stress can be of value. People who have constant psychological issues should be made aware of the importance of professional help.

1.10.5 Environmental and Occupational Exposures

Assessing environmental and job exposures is a key component of preconception care; after all, various kinds of physical, chemical, and biological risks can negatively influence fertility or pregnancy outcomes. Work-related exposures may involve the use of chemicals (such as pesticides), heavy metals, radiation, biological agents, excessive heat, or unsafe working

conditions. The risks related to household exposures, for example, tobacco, some cleaning agents, food or water contamination, and pollutants, should not be neglected as well. People should be motivated to detect exposures and take relevant safety measures, including following safety rules and using personal protective equipment when necessary. Occupational health specialists or other professionals should be consulted if one suspects evidence of exposure.

1.10.6 Oral Health

Oral health is an important aspect of preconception care, even if not all women place enough importance to it. The hormonal changes that come with pregnancy can make gingival inflammation and various dental issues more prevalent, while existing periodontal diseases might influence the general well-being of the mother. Women who are going to get pregnant should focus on ensuring good oral hygiene going forward through controlling their oral cavities on the regular basis. They should try to eliminate any dental caries, gingivitis, or periodontal diseases before the moment of conception when such a possibility arises.

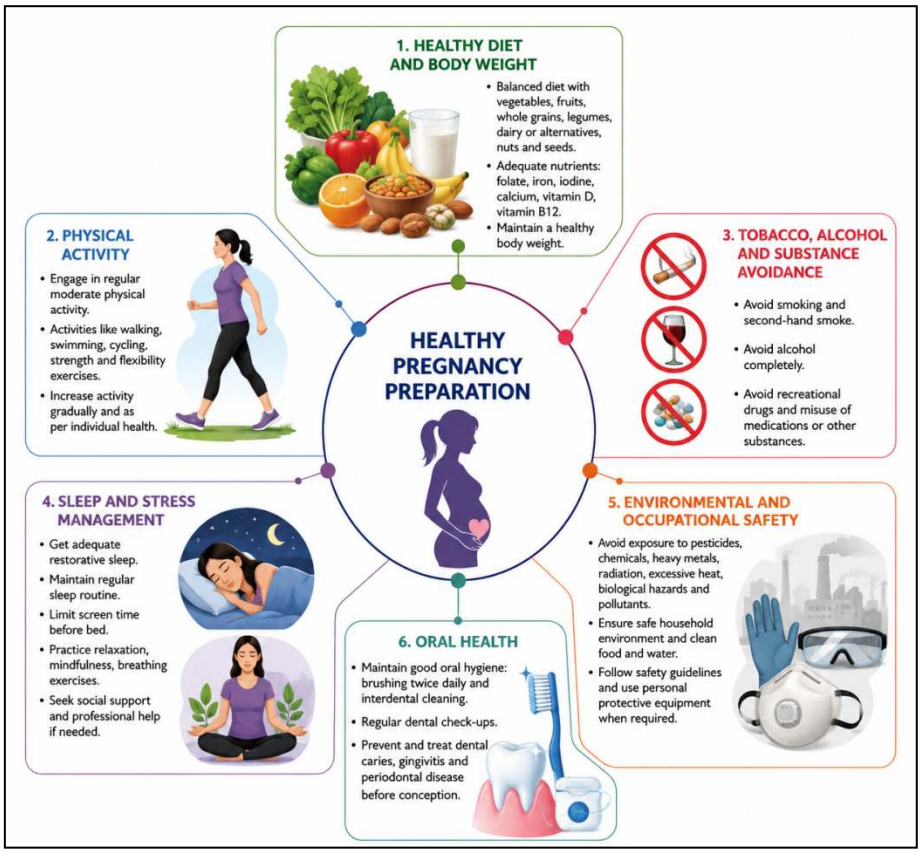


Figure 2: Lifestyle modifications for healthy pregnancy preparation.

1.11 Role of Healthcare Professionals in Preconception Care

1.11.1 Role of Physicians and Pharmacists

The role of the physician in preconception care is critical because the doctor can evaluate the general and reproductive health of the patients and the medical disorders which might affect the births and conception. The physician checks the chronic conditions, inspects the medical and obstetric history of the patients, and also prescribes the needed tests in order to ascertain the state of the patients' immune system and to treat any chronic disorders. The doctor may also determine whether some patients need to be sent to specialists for further treatment during the period of pregnancy. The pharmacist can help by checking the prescriptions and over-the-counter medicines, herbal remedies, dietary supplements, and determining how these medications can affect the process of contraception and pregnancy per se. Prescribing the wrong medication can affect not only the health of the pregnant woman but also that of her fetus. The cooperative work of the doctor and pharmacist makes it possible to guarantee that the pregnant patients receive the necessary treatment without exposing themselves to unnecessary dangers.[44]

1.11.2 Role of Nurses and Midwives

The tasks of nurses and midwives include rendering continuous and accessible preconception education and assistance since they may gather significant health and reproductive information, evaluate primary health indicators, communicate possible hazards, and reiterate the recommendations of healthcare specialists. They offer valuable nutritional advice, help in exercising, maintaining healthy weight, avoiding alcoholic and tobacco usage, complying with medications prescribed, immunization, and preparing for pregnancy. Midwives offer support regarding reproductive health education, awareness of fertility, family planning, and preparation for conceiving a baby. They guide a person in accessing relevant preconception and prenatal services. Their regular engagements lead to good opportunities for ensuring that people adhere to healthy practices concerning preconception care.

1.11.3 Role of Genetic Counsellors

Genetic counsellors offer specialized guidance for people and couples who may have a heightened danger of genetic or inherited diseases. They look over individual and family histories, determine potential genetic dangers, and clarify the purpose and availability of carrier screening and genetic tests. When a genetic condition or carrier status is discovered, genetic counsellors explain the possible modes of inheritance, reproductive consequences, and available choices in a way that their clients can comprehend. They also assist people in understanding their genetic test findings and clarifying the advantages, limitations, and uncertainties regarding the test. The genetic counseling aims to assist every individual in making an informed and voluntary decision without pushing any particular choices in the area

of reproduction. If needed, the counselors will help people find specialists, laboratories, and services related to reproduction.

1.11.4 Patient Education and Counselling

Patient knowledge is one of the core elements of preconception care as educated people are in a better position to make good decisions regarding their reproductive health. Healthcare practitioners should provide straightforward and reliable information on fertility and family planning, preparing for having a child, nutrition and taking folic acid, physical activities and proper weight, use of medicine, immunization, oral hygiene, and abstaining from such substances as tobacco and alcohol. [45]Education should also highlight the necessity of dealing with chronic diseases and going to a doctor when necessary. Counseling needs to be personalized and based on age, health condition, reproductive plans, culture, and personal wishes. It is vital that communication enables a free flow of questions and suggests participation in the decision-making process while ensuring confidentiality and respect for the individual's right to privacy.

1.11.5 Multidisciplinary Care

Using a coordinated interdisciplinary strategy is the best way to implement the preconception care plan. The cooperation of doctors, nurses, pharmacists, midwives, genetic counselors, dieticians, dentists, mental health specialists, as well as other specialists when necessary, is required. Different healthcare professionals possess special knowledge and skills to study and manage the medical, nutritional, reproductive, genetic, psychological, and lifestyle factors. The approach is especially beneficial when managing patients that suffer from chronic diseases, or patients with complicated reproductive health. The interaction and collaboration of all specialists involved can reduce premature care and avoid significant risks before the start of the conception.

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