هـيـئـة الصـحـة بدبـي
DUBAI HEALTH AUTHORITY

إجـادة
EJADA

EJADA Program

Maternal care

KPIs and Recommendations

2024

Maternal Care
KPIs and Recommendations

Content

Introduction

The term "maternal health" describes the health of a women before, during, and after childbirth. Maternal mortality is accounted as a key health indicator in women. Excessive blood loss, infections, high blood pressure, unsafe abortions, and obstructed delivery are the most frequent direct causes of maternal injury and death, as are indirect factors such as anemia, malaria, and heart disease. Numerous socio-economic and cultural factors, such as poor socio-economic status, early marriage, low levels of women's empowerment, traditional preferences for at-home births etc., contribute to increased fatalities. All pregnant women must have access to prenatal care, expert care during childbirth, and assistance in the weeks after the delivery.

During pregnancy, international guidelines that all pregnant women hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) testing. Additionally, pregnant women should also be screened to undergo risk assessment and testing for gestational diabetes via oral glucose tolerance test. Antenatal care should be provided to pregnant women with diabetes which includes monitoring blood glucose and HbA1c, pharmacological treatment, retinal assessment, renal assessment and tests for detecting congenital malformations. For better mental health and well being of both mother and child, pregnant women are advised to take vitamin supplements (C, D, B_{12}, and folic acid). Other complications such as hypertension and hypo- or hyper-thyroidism may also be detected in pregnant women and screening is highly effective in managing these conditions early for maternal and fetal well-being.

Post-partum care is as important as prenatal care. However, even in developed countries a high proportion of women do not seek postpartum care. This trend is attributed to cultural differences, lack of good transitional care management, lack of health insurance, low socioeconomic status, poor anticipatory guidance, lack of adequate family support, race, and poor access to home visits. During the first week of the postnatal period, severe hypertension, hemorrhage, and infection are the most common contributors to increased mortality, while the cardiovascular disorders are the leading cause of late maternal mortality. Other postpartum concerns include transient depression (baby blues), fatigue incontinence, hemorrhoids, etc. It is critical that post partum care be given as much importance as prenatal care.

It is important to mention that improved education on pregnancy and postpartum care, especially on self-care, healing, and nursing, can aid new mothers in maintaining realistic expectations and help them better prepare for this time. The World Health Organization (WHO) recommends new mothers visit a health-care provider 2–3 days after discharge and again 4–6 weeks postpartum to undergo comprehensive postpartum care.

Scope

The Ejada KPIs are quality indicators and ratings for physicians, facilities and insurance companies based on information collected by DHA systems from providers, payers and patients.

The maternal care KPIs and recommendations are based on UAE and international guidelines on maternal care management. The KPIs are designed for healthcare practioners and providers to follow international best practices in the management of maternal care patients.

The maternal care KPIs cover the following aspects of maternal care management:

- Screenings for neural tube defects, chromosomal abnormalities, gestational diabetes, HIV, HBsAg, and other disorders during pregnancy
- Pharmacological management of hypertension in pregnancy and hospitalization during prenatal complications
- Cesarean and normal delivery for medical indications
- Vaccination during pregnancy
- Medical, mechanical, radiological, or surgical management of postpartum hemorrhage
- Anemia Management

The KPIs and recommendations have been reviewed by leading experts in UAE.

List of abbreviations

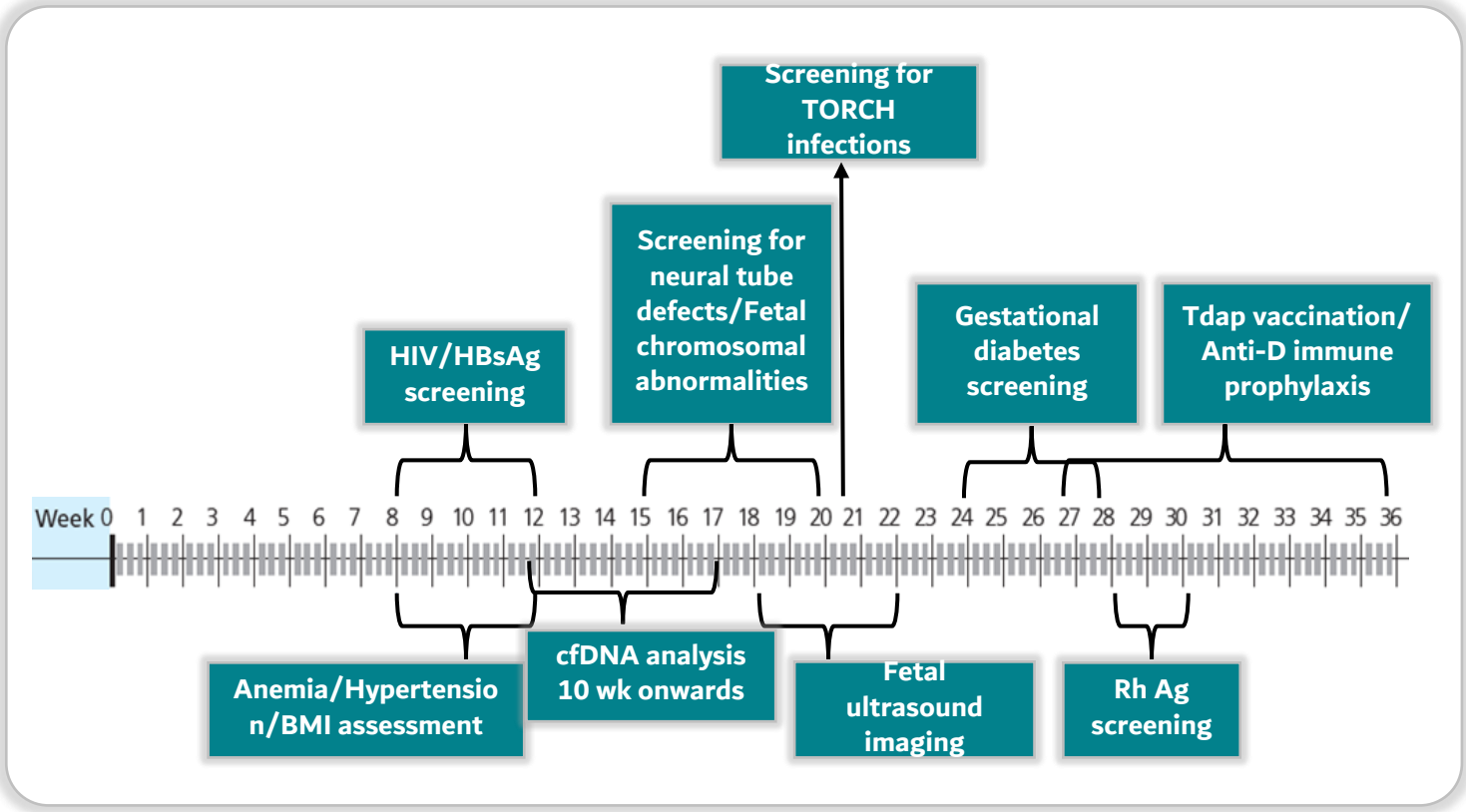
S.No.	Abbreviation	Full form
1	ACOG	The American College of Obstetricians and Gynecologists
2	BP	Blood pressure
3	BMI	Body mass index
4	cfDNA	Cell-free DNA
5	FIGO	International Federation of Gynecology and Obstetrics
6	FOGSI	The Federation of Obstetric and Gynecological Societies of India;
7	GDM	Gestational diabetes mellitus
8	Hb	Hemoglobin
9	HIV	Human immunodeficiency virus
10	HBsAg	Hepatitis B surface antigen
11	KPI	Key performance indicator
12	I.V.	Intravenous
13	LMP	Last menstrual period
14	MSAFP	Maternal serum alpha-fetoprotein
15	NICE	The National Institute for Health and Care Excellence
16	OGTT	Oral glucose tolerance test
17	PPH	Postpartum hemorrhage
18	Rh	Rhesus
19	TXA	Tranexamic acid
20	TORCH	Toxoplasmosis, rubella, cytomegalovirus, and herpes simplex virus
21	USG	Ultrasonography
22	WHO	World Health Organization

KPIs and their measuring parameters

Reporting Frequency: Monthly

S.No.	KPIs	Measuring parameters
1	Fetal ultrasound imaging for assessment of gestational age at 18 to 22 weeks	USG, gestational age
2	Screening for neural tube defects at 15 to 20 weeks	Serum alpha-fetoprotein screen (MSAFP) and USG
3	Non-Invasive prenatal Testing cfDNA-NGS	cfDNA
4	Screening for fetal chromosomal abnormalities at 15 to 20 weeks	USG, pregnancy-associated plasma protein A, human chorionic gonadotropin, maternal serum alpha-fetoprotein (MSAFP) and estriol, inhibin levels
5	Screening for gestational diabetes mellitus (GDM) at 24 to 28 weeks	Oral glucose tolerance test (OGTT)
6	Screening for hepatitis B surface antigen (HBsAg)	HBV surface antigen
7	Screening for human immunodeficiency virus (HIV)	HIV antibody
8	Screening for TORCH infections at 20 weeks	TORCH test
9	Screening for Rh antigen at 28 to 30 weeks	Coomb's/indirect Coomb's test
10	Screening for iron deficiency anemia in pregnancy	Hemoglobin (Hb) test
11	Screening for hypertension in pregnancy	Blood pressure measurement (>140/90 mm)
12	Low BMI at first prenatal care visit	Body mass index (BMI)
13	Elective delivery and early induction of labor for only medical indications before 39 weeks of gestation	Elective deliveries, gestational age, medical conditions
14	Cesarean delivery for medical indications	Cesarean surgery
15	Normal delivery without any assisted methods	Vaginal deliveries, gestational age
16	Management of hypertension in pregnancy	DDC list of anti-hypertensives
17	Vaccination during pregnancy	Tdap, influenza, varicella/rubella vaccines
18	Anti-D immune prophylaxis in Rh-negative pregnant women	Anti-D administration, Rh negative status
19	Hospitalization during pregnancy-prenatal complications	Hospitalization, complication diagnosis
20	Medical management of postpartum hemorrhage with IV oxytocin	DDC list of IV oxytocin
21	Medical management of postpartum hemorrhage with IV tranexamic acid	DDC list of IV tranexamic acid
22	Mechanical, radiological, or surgical management of postpartum hemorrhage	Interventional procedures conducted for PPH
23	Hysterectomy in the management of postpartum hemorrhage	Hysterectomy
24	Antepartum anemia management with supplemental iron	Hb levels, DDC list if iron preparations
25	Intrapartum severe anemia management with red cell transfusion	Hb levels, blood transfusions
26	Hormonal Contraceptives for High-Risk Patient Populations with contraindications to pregnancy	DDC list of hormonal contraceptives

Timeline for various antenatal care tests



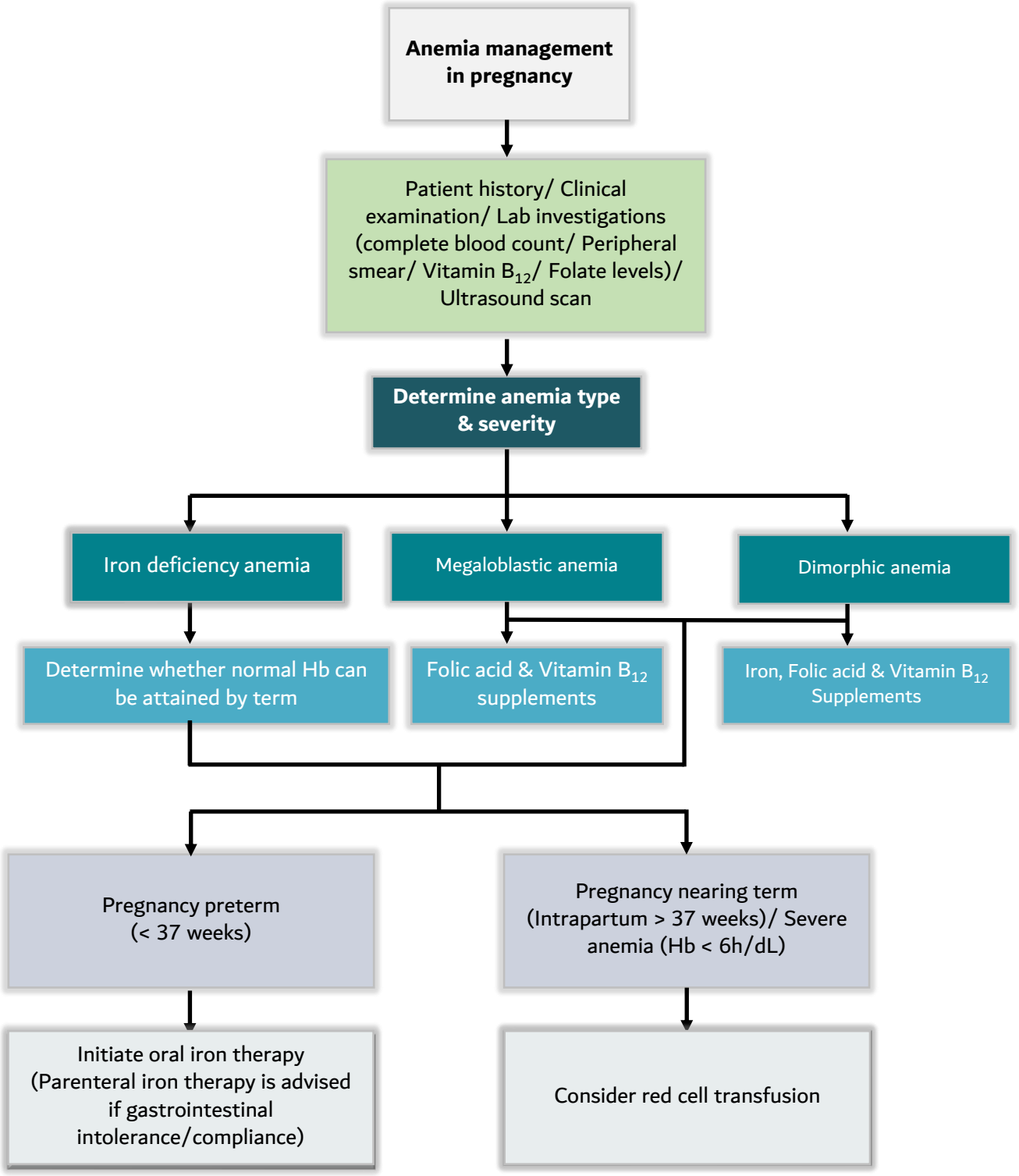
Adapted and modified from:
ACOG Guidelines for Perinatal Care - 2017; WHO Recommendations on Antenatal Care - 2016; NICE Antenatal Care Guideline - 2021

Treatment options for the management of postpartum hemorrhage (PPH)

Stage 0 All birth- Routine Measures	Stage 1 QBL > 500 mL vaginal birth or > 1000 mL C-Section or Vital Signs unstable with continued bleeding	Stage 2 QBL 1000- <1500 mL with continued bleeding	Stage 3 BL exceeds 1500 mL
Encourage Uterus to contract		**Control Bleeding with Pressure**	**Shutdown/remove source of bleeding**
• Uterine massage • Low dose of oxytocin 	• More drugs, higher doses • More uterine massage • Vacuum- induced hemorrhage control device (the Jada system). The Jada system uses a low-level vacuum (80 ± 10 mm Hg; recommended range: 70-90 mmHg)	• Uterine packing • Uterine balloon 	• Arterial ligation/ embolization • B-Lynch suture • Hysterectomy

Adapted & modified from: CMQCC Obstetric Hemorrhage Toolkit 2015 Obstetric Hemorrhage 2.0 Toolkit | California Maternal Quality Care Collaborative (cmqcc.org)

Antenatal management of severe anemia in pregnancy



Adapted & modified from: ACOG Guidelines for Perinatal Care - 2017; FOGSI Management of Iron Deficiency Anemia in Pregnancy - 2016; NICE Antenatal Care Guideline - 2021; WHO Recommendations on Antenatal Care - 2016

Abbreviation: ACOG, The American College of Obstetricians and Gynecologists; Hb, hemoglobin; FOGSI, The Federation of Obstetric and Gynecological Societies of India; NICE, The National Institute for Health and Care Excellence UK; WHO, World Health Organization

Summary of maternal immunization recommendations

Vaccine	Indicated During Every Pregnancy	May Be Given During Pregnancy in Certain Populations	Contraindicated During Pregnancy	Can Be Initiated Postpartum or When Breastfeeding or Both
Inactivated influenza	X†			X‡
Tetanus toxoid, reduced diptheria toxoid and acellular pertussis (Tdap)	X†			X‡
Pneumococcal Vaccines		X§		X§
Meningococcal conjugate (MenACWY) and Meningococcal serogroup B		X‖		X‖
Hepatitis A		X¶		X¶
Hepatitis B		X#		X#
Humanpapillomavirus (HPV)**				X**
Measles, mumps, and rubella			X††	X††
Varicella			X††	X††

An "X" indicates that the vaccine can be given in this window

† Inactivated influenza vaccination can be given in any trimester and should be given with each influenza season as soon as the vaccine is available. The Tdap vaccine is given at 27–36 weeks of gestation in each pregnancy, preferably as early in the 27–36-week window as possible. The Tdap vaccine should be given during each pregnancy to boost the maternal immune response and maximize the passive antibody transfer to the newborn. Women who did not receive Tdap during pregnancy (and have never received the Tdap vaccine) should be immunized once in the immediate postpartum period

‡ Vaccination during every pregnancy is preferred over vaccination during the postpartum period to ensure antibody transfer to the newborn

§ There are two pneumococcal vaccines: 1) the 23-valent pneumococcal polysaccharide vaccine (PPSV23) is recommended in reproductive-age women who have heart disease, lung disease, sickle cell disease, and diabetes as well as other chronic illnesses; 2) the 13-valent pneumococcal vaccine (PCV13) is recommended for reproductive-aged women with certain immunocompromised conditions, including human immunodeficiency virus (HIV) infection and asplenia. The PCV13 vaccines should be deferred in pregnant women, unless the woman is at increased risk of pneumococcal disease and after consultation with her health care provider the benefits of vaccination are considered to outweigh the potential risks

‖ Quadrivalent conjugate meningococcal vaccine is routinely recommended for adolescents aged 11–18 years, along with individuals with HIV infection, complement component deficiency (including eculizumab use), functional or anatomic asplenia (including sickle cell disease), exposure outbreak, travel to endemic or hyperendemic areas, or work as a microbiologist routinely exposed to preclude vaccination. The serogroup B vaccine should be deferred in pregnant women, unless the woman is at increased risk during a meningococcal disease . If indicated, pregnancy should not increase risk of serogroup B meningococcal disease and, after consultation with her health care provider, the benefits of vaccination are considered to outweigh the potential risks.

¶ Pregnant women with any of the conditions that increase the risk of either acquiring or having a severe outcome from hepatitis A infection (e.g., having chronic liver disease, clotting-factor disorders, traveling, using injection and non injection drugs, and working with nonhuman primates) should be vaccinated during pregnancy if not previously vaccinated. Pregnant women at risk of hepatitis A infection during pregnancy should also be counseled concerning all options to prevent hepatitis A infection. Any woman who wants to be protected from hepatitis A or has an indication for use may receive the vaccine during pregnancy or during the postpartum period.

Hepatitis B vaccination is recommended for women who are identified as being at risk of hepatitis B infection during pregnancy (e.g., women who have household contacts or sex partners who are hepatitis B surface antigen–positive; have more than one sex partner during the previous 6 months; have been evaluated or treated for a sexually transmitted infection; are current or recent injection-drug users; have chronic liver disease; have HIV infection; or have traveled to certain countries). Any woman who wants to be protected from hepatitis B or has an indication for use may receive the vaccine during pregnancy and the postpartum period. Pregnant women at risk of hepatitis B infection during pregnancy should be counseled concerning other methods to prevent hepatitis B infection.

** The HPV vaccination in pregnancy is not recommended, however, inadvertent HPV vaccination during pregnancy is not associated with adverse events for the woman or her fetus. The HPV vaccine can be given to postpartum and breastfeeding women. The HPV vaccine should be administered to women through age 26 years who were not previously vaccinated. Vaccination timing and number of doses should follow Centers for Disease Control and Prevention and American College of Obstetricians and Gynecologists' guidance.

†† Live attenuated vaccines including, measles–mumps–rubella, varicella, and live-attenuated influenza vaccine are contraindicated for pregnant women. If indicated (i.e., among seronegative women), the measles–mumps–rubella vaccine and the varicella vaccine should be given during the postpartum period. Inadvertent administration during pregnancy has not been associated with congenital rubella or congenital varicella syndromes.

Adapted from: ACOG Committee Opinion No. 741. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;131:e214–7

Health Outcomes Indicators

Fetal ultrasound imaging for assessment of gestational age at 18 to 22 weeks

Description Title	Fetal ultrasound imaging for assessment of gestational age at 18 to 22 weeks
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had fetal imaging done by ultrasonography at 18 to 22 weeks of last menstrual period (LMP)
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had fetal imaging done by ultrasonography at 18 to 22 weeks of last menstrual period (LMP)
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(Numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Fetal ultrasound imaging is recommended in all pregnant women for accurately determining gestational age. In addition, fetal number, viability, and placental location could also be determined using ultrasound. This is important for timing of appropriate obstetric care, scheduling and interpretation of certain antepartum tests, determining the appropriateness of fetal growth, and designing interventions to prevent preterm births, post term births, and related morbidities.

Screening for neural tube defects at 15 to 20 weeks

Description Title	Screening for neural tube defects at 15 to 20 weeks
Definition	Percentage of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for neural tube defects using maternal serum alpha-fetoprotein (MSAFP) test (at 15 to 20 weeks gestation) or by ultrasound (after 16 weeks gestation)
Numerator	Number of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for neural tube defects using maternal serum alpha-fetoprotein (MSAFP) test (at 15 to 20 weeks gestation) or by ultrasound (after 16 weeks gestation)
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(Numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	MSAFP testing, ultrasound, or both, may be used to screen for neural tube defects such as spina bifida (open spine) and anencephaly (open skull). MSAFP has a sensitivity of approximately 80 % for open spina bifida and 95 % for anencephaly. Pregnant women with increased MSAFP levels should be evaluated by ultrasonography to confirm neural tube defects.

Non-Invasive prenatal Testing cfDNA-NGS

Description Title	Non-Invasive prenatal testing cfDNA in all pregnant women
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care who had an evaluation of placental DNA (cfDNA) in blood from gestational age of 10-weeks onwards
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care who had an evaluation of placental DNA (cfDNA) in blood from gestational age of 10-weeks onwards
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	None
Unit of measure	Percentage [(Numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Maternal plasma cfDNA contains both maternal and fetal sources of cfDNA. The source of fetal DNA is the trophoblast, while the predominant source of maternal DNA is the hematopoietic system. All maternal organs contribute some cfDNA into maternal plasma, including solid tumors. Evaluation of the proportion of placental (cfDNA) in the blood of pregnant women, thereby estimating the risks for common fetal aneuploidies with an accuracy in detecting Trisomies 21, 18, & 13, it can be offered from the gestational age of 10 weeks onwards, regardless of a pre-existing risk.

Screening for fetal chromosomal abnormalities at 15 to 20 weeks

Description Title	Screening for fetal chromosomal abnormalities at 15 to 20 weeks
Definition	Percentage of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for fetal chromosomal abnormalities using nuchal translucency measurement, and any of the biochemical markers (pregnancy-associated plasma protein A, human chorionic gonadotropin, maternal serum alpha-fetoprotein (MSAFP), estriol and inhibin levels at 15 to 20 weeks of gestation
Numerator	Number of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for fetal chromosomal abnormalities using nuchal translucency measurement, and any of the biochemical markers (pregnancy-associated plasma protein A, human chorionic gonadotropin, maternal serum alpha-fetoprotein (MSAFP), estriol, inhibin levels, and cell-free DNA [cfDNA]) at 15 to 20 weeks of gestation
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(Numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Factors such as maternal/gestational age, number of fetuses, previous obstetric history, family history, availability of nuchal translucency measurement, test sensitivity and limitations, risk of invasive diagnostic procedures, desire for early test results, and reproductive options, should be considered before choosing the screening test for fetal chromosomal abnormalities. Hence, it is recommended that health care providers who offer screening tests need to be familiar with the performance (sensitivity/specificity) of the specific test used.

Screening for gestational diabetes mellitus (GDM) at 24 to 28 weeks

Description Title	Screening for gestational diabetes mellitus (GDM) at 24 to 28 weeks
Definition	Percentage of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for GDM (diagnostic oral glucose tolerance test [OGTT] threshold [≥ 140 mg per dl at 100-g, 3 hr.) At 24 to 28 weeks of gestation
Numerator	Number of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for GDM (diagnostic oral glucose tolerance test [OGTT] threshold [≥ 140 mg per dl at 100-g, 3 hr.) At 24 to 28 weeks of gestation
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death, previously diagnosed diabetes patients
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Screening GDM is recommended in all pregnant women, as the treatment of GDM to improve glycemic control has been shown to decrease pregnancy-related morbidity, including cesarean delivery, shoulder dystocia, macrosomia, and neonatal hypoglycemia.

Screening for hepatitis B surface antigen (HBsAg)

Description Title	Screening for hepatitis B surface antigen (HBsAg)
Definition	Percentage of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screening for HBsAg
Numerator	Number of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screening for HBsAg
Denominator	Total number of patients regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death, patients with documented immunity to Hepatitis B
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Screening for HBsAg is recommended in all pregnant women. If tested HBsAg positive, it is recommended to counsel patient regarding health risks; document clearly in the chart so that the infant's physicians know to treat the infant with hepatitis B vaccination and hepatitis B immune globulin.

Screening for human immunodeficiency virus (HIV)

Description Title	Screening for Human Immunodeficiency Virus (HIV)
Definition	Percentage of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for HIV at first prenatal care visit
Numerator	Number of patients, regardless of age who gave birth during a 12-month period, seen at least once for prenatal care and had screened for HIV at first prenatal care visit
Denominator	Total number of patients regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death, patients previously diagnosed with HIV
Unit of measure	Percentage [(numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Screening for HIV is recommended in all pregnant woman. If tested HIV positive, counseling and referring the patient to an infectious disease clinic or maternal–fetal medicine specialist for further management is recommended.

Screening for TORCH infections at 20 weeks

Description Title	Screening for TORCH infections at 20 weeks
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for toxoplasmosis, other pathogens, rubella, cytomegalovirus, and herpes simplex virus (TORCH) infections
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for toxoplasmosis, other pathogens, rubella, cytomegalovirus, and herpes simplex virus (TORCH) infections
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	The TORCH infections are caused by a group of pathogens which are subclinical initially and difficult to diagnose during pregnancy. These pathogens have the potential to cause negative obstetrical outcomes in the form of congenital anomalies, oligohydramnios, FGR (fetal growth restriction), IUFD (intrauterine fetal death), recurrent pregnancy loss (RPL), and stillbirth.

Screening for Rh antigen at 28 to 30 weeks

Description Title	Screening for Rh antigen at 28 to 30 weeks
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for Rh antigen using Coomb's test/indirect Coomb's test
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for Rh antigen using Coomb's test/Indirect Coomb's test
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	If husband is Rh positive, routine antenatal anti-D immunoglobulin prophylaxis is indicated for all pregnant women who are Rh negative and who are not known to be sensitized to RhD antigen.

Screening for iron deficiency anemia in pregnancy

Description Title	Screening for iron deficiency anemia in pregnancy
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for iron deficiency anemia, defined as blood hemoglobin (Hb) concentrations of <110 g/L in the first trimester, <105 g/L in the second/third trimesters of pregnancy, and <100 g/L during postpartum (the first 6 weeks after giving birth)
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for iron deficiency anemia, defined as blood hemoglobin (Hb) concentrations of <110 g/L in the first trimester, <105 g/L in the second/third trimesters of pregnancy, and <100 g/L during postpartum (the first 6 weeks after giving birth)
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death, known cases of previously diagnosed anemia of any type
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	The two most common causes of anemia in pregnancy are iron deficiency and acute blood loss. Iron deficiency anemia during pregnancy has been associated with an increased risk of low birth weight, preterm delivery, and perinatal mortality.

Screening for hypertension in pregnancy

Description Title	Screening for hypertension in pregnancy
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for hypertension (defined as >140/90 mm measured on two occasions at least 4 hours apart), before 20 weeks of gestation.
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had screened for hypertension (defined as >140/90 mm measured on two occasions at least 4 hours apart), before 20 weeks of gestation.
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death, known cases of previously diagnosed hypertension irrespective of cause
Unit of measure	Percentage [(numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	Data show that hypertension is present in 0.9–1.5% of pregnant women and may result in significant maternal, fetal, and neonatal morbidity/mortality. It is recommended to maintain blood pressure levels for pregnant women with chronic hypertension treated with antihypertensive medications.

Low BMI at first prenatal care visit

Description Title	Low BMI at first prenatal care visit
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had a BMI value recorded (underweight: BMI <18.5kg/m^2)
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had a BMI value recorded (underweight: BMI <18.5kg/m^2)
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, miscarriage, abortion, intra-uterine death
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	It is recommended that pregnant women with underweight (BMI <18.5kg/m_2) should be referred for nutrition counseling and considered at increased risk for fetal growth restriction. Obese (BMI >30 kg/m_2) pregnant women should receive counseling about weight reduction, nutrition, and food choices.

Elective delivery and early induction of labor for only medical indications before 39 weeks of gestation

Description Title	Elective delivery and early induction of labor for only medical indications before 39 weeks of gestation
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care, and had elective deliveries or early inductions with medical indication* at 37 to 39 weeks of gestation
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care, and had elective deliveries or early inductions with medical indication* at 37 to 39 weeks of gestation
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Intra-uterine death, greater than 39 weeks of gestation
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Lower is better
Rationale	It is advised that elective deliveries should not be undertaken before 39 weeks of gestation, unless there is a medical indication (such as *hemorrhage and placental complication, hypertension, preeclampsia/eclampsia, rupture of membranes, maternal/fetal conditions complicating pregnancy/delivery, malposition/ malpresentation of fetus, late pregnancy, prior uterine surgery). If an elective delivery is planned after 39 weeks of gestation, then accuracy of the gestational age, cervical status, and consideration of any potential risks to the mother or fetus are important in any discussion of a nonmedically indicated delivery.

Cesarean delivery for medical indications

Description Title	Cesarean delivery for medical indications
Definition	Percentage of patients, regardless of age, who gave birth to a live singleton during a 12-month period and had a cesarean delivery for medical indications at or beyond 37 weeks of gestation
Numerator	Number of patients, regardless of age, who gave birth to a to a live singleton during a 12-month period and had a cesarean delivery for medical indications at or beyond 37 weeks of gestation
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Intra-uterine death, less than 39 weeks of gestation
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Lower is better
Rationale	Cesarean delivery should be performed in medical indications only after 37 weeks and lung maturity is documented. Cesarean delivery should not be motivated by the unavailability of effective pain management. Also, cesarean delivery is not recommended for women desiring several children, given that the risks of placenta previa, placenta accreta, and gravid hysterectomy increase with each cesarean deliver.

Normal delivery without any assisted methods

Description Title	Normal Delivery Without Any Assisted Methods
Definition	Percentage of patients, regardless of age, who gave birth vaginally during a 12-month period whose had spontaneous normal vaginal delivery without any assisted methods (the use of induced labor, forceps and vacuum assistance) at 37 to 41 weeks of gestation
Numerator	Number of patients, regardless of age, who gave birth vaginally during a 12-month period whose had spontaneous normal vaginal delivery without any assisted methods (the use of induced labor, forceps and vacuum assistance) at 37 to 41 weeks of gestation
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Intra-uterine death, less than 37 weeks or more than 41 weeks gestation, any form of assisted method (the use of induced labor, forceps and vacuum assistance)
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher is better
Rationale	A normal delivery is recommended which is spontaneous in onset, low-risk at the start of labor, and remains so throughout labor and birth. The infant is born spontaneously in vertex position between 37 and 41+ completed weeks of pregnancy. Normal birth includes the opportunity for skin–skin holding and breastfeeding in the first hour after the birth. However, the individual patient and clinical condition should be considered in determining spontaneous labor and normal vaginal delivery is contraindicated.

Management of hypertension in pregnancy

Description Title	Management of hypertension in pregnancy
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and prescribed any of antihypertensive agents (labetalol/nifedipine/methyldopa) for chronic maintenance treatment of hypertension
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and prescribed any of antihypertensive agents (labetalol/nifedipine/methyldopa) for chronic maintenance treatment of hypertension
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancies, intra-uterine death, patients receiving ant-hypertensives prior to pregnancy
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher is better
Rationale	Treatment with antihypertensive medications is recommended to control hypertension as a preventive measure of maternal, fetal, and neonatal morbidity/mortality.

Vaccination during pregnancy

Description Title	Vaccination during pregnancy
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had vaccination for tdap (tetanus, diphtheria, pertussis at 27 to 36 weeks), influenza vaccination (any gestational age), and varicella/rubella (at least 1-month prior to conception, or in the immediate postpartum period)
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had vaccinated for tdap (tetanus, diphtheria, pertussis at 27 to 36 weeks), influenza vaccination (any gestational age), and varicella/rubella (at least 1-month prior to conception, or in the immediate postpartum period)
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Intra-uterine death, patient who refused vaccination or who are unable to receive vaccination due to documented allergies
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Higher is better
Rationale	Tdap vaccination during pregnancy is associated with an increase in protective diphtheria and pertussis antibody levels in newborns of vaccinated mothers. Hence recommended to prevent acquisition of pertussis in both mothers and newborns. Influenza vaccination is recommended for all pregnant women at any gestational age especially in influenza season. Pregnant women who are non-immune/non-vaccinated to varicella/rubella should avoid exposure to those infections.

Anti-D immune prophylaxis in Rh-negative pregnant women

Description Title	Anti-D immune prophylaxis in Rh-negative pregnant women
Definition	Percentage of Rh-negative patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had administered for Anti-D immunoglobulin (250-300 µg = 1250-1500 IU) at 28 to 34 weeks
Numerator	Number of Rh-negative patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and had administered for Anti-D immunoglobulin (250-300 µg = 1250-1500 IU) at 28 to 34 weeks
Denominator	Total number of Rh-negative patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Intra-uterine death, patient who refused immune prophylaxis or who are unable to receive due to documented allergies
Unit of measure	Percentage [(numerator/Denominator x 100)]
Measure target and/or threshold	Higher % of patients screened is better
Rationale	If husband is Rh positive, routine antenatal anti-D immunoglobulin prophylaxis is indicated for all pregnant women who are Rh negative and who are not known to be sensitized to RhD antigen.

Hospitalization during pregnancy-prenatal complications

Description Title	Hospitalization during pregnancy-prenatal complications
Definition	Percentage of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and required hospitalization due to complications such as hemorrhage, placental complication, hypertension, preeclampsia/eclampsia, rupture of membranes, maternal/fetal conditions, malposition/malpresentation of fetus, late pregnancy, prior uterine surgery
Numerator	Number of patients, regardless of age, who gave birth during a 12-month period, seen at least once for prenatal care and required hospitalization due to complications such as hemorrhage, placental complication, hypertension, preeclampsia/eclampsia, rupture of membranes, maternal/fetal conditions, malposition/malpresentation of fetus, late pregnancy, prior uterine surgery
Denominator	Total number of patients of any age, reported at least once for prenatal care, and gave birth during a 12-month period
Exclusion criteria	Ectopic pregnancy, miscarriage, abortions, hospitalizations not related to pregnancy related medical conditions
Unit of measure	Percentage [(numerator/denominator x 100)]
Measure target and/or threshold	Lower is better
Rationale	Prenatal complications due such as hemorrhage, placental complication, hypertension, preeclampsia/ eclampsia, rupture of membranes, maternal/fetal conditions, malposition/malpresentation of fetus, late pregnancy, prior uterine surgery, may be medical indications for induction of labor and hence require hospitalization or emergency care.

Medical management of postpartum hemorrhage with IV oxytocin

Description Title	Medical management of postpartum hemorrhage with IV oxytocin
Definition	Percentage of women who received IV oxytocin for the treatment of postpartum hemorrhage during the last 12 months
Numerator	Number of women who received IV oxytocin for the treatment of postpartum hemorrhage during the last 12 months
Denominator	Total number of women experiencing postpartum hemorrhage
Exclusion criteria	PPH not related to uterine atony such as coagulopathies
Unit of measure	Percentage [(numerator/Denominator) x 100]
Measure target and/or threshold	Higher the better
Rationale	If atony is the etiology, uterotonics are considered the first-line treatment for uterine atony. Intravenous oxytocin is usually the preferred drug.

Medical management of postpartum hemorrhage with IV tranexamic acid

Description Title	Medical management of postpartum hemorrhage with IV tranexamic acid
Definition	Percentage of women who received 1 gm IV tranexamic acid within 3 h from birth for the treatment of postpartum hemorrhage during the last 12 months
Numerator	Number of women who received 1 gm IV tranexamic acid within 3 h from birth for the treatment of postpartum hemorrhage during the last 12 months
Denominator	Total number of women experiencing postpartum hemorrhage
Exclusion criteria	PPH not related to uterine atony such as coagulopathies
Unit of measure	Percentage [(numerator/denominator) x 100]
Measure target and/or threshold	Higher the better
Rationale	Since publication of the World Maternal Antifibrolytic (WOMAN) trial, tranexamic acid (TXA), an antifibrinolytic drug, has been incorporated into PPH guidelines around the world. WHO has updated this topic and recommends the use of TXA, as soon as possible, within the first 3 h from birth, at a dose of 1 g intravenously, regardless of the route of birth.

Mechanical, radiological, or surgical management of postpartum hemorrhage

Description Title	Mechanical, radiological, or surgical management of postpartum hemorrhage
Definition	Percentage of women who underwent uterine balloon tamponade or uterine compressive sutures or pelvic vascular ligation or embolization for postpartum hemorrhage during the last 12 months
Numerator	Number of women who underwent uterine balloon tamponade or uterine compressive sutures or pelvic vascular ligation or embolization for postpartum hemorrhage during the last 12 months
Denominator	Total number of women with a diagnosis of PPH during the last 12 months
Exclusion criteria	PPH not related to uterine atony such as coagulopathies
Unit of measure	Percentage [(numerator/denominator) x 100]
Measure target and/or threshold	Lower the better
Rationale	When pharmacological treatment fails in controlling hemorrhage, guidelines usually recommend some mechanical, radiological, and more conservative surgical approaches before performing hysterectomy. UBT is typically indicated as the treatment of choice when uterine atony is refractory to uterotonics after vaginal delivery as it is less invasive than the other procedures. This should be considered after ruling out retained products of conception, ruptured uterus, or vaginal or cervical laceration as a contributing factor. If UBT fails to control bleeding in these cases, invasive treatments by arterial embolization or, most commonly, by surgical approaches are recommended.

Hysterectomy in the management of postpartum hemorrhage

Description Title	Hysterectomy in the management of postpartum hemorrhage
Definition	Percentage of women who underwent hysterectomy for postpartum hemorrhage during the last 12 months
Numerator	Number of women who underwent hysterectomy for postpartum hemorrhage during the last 12 months
Denominator	Total number of women with a diagnosis of PPH during the last 12 months
Exclusion criteria	PPH not related to uterine atony such as coagulopathies
Unit of measure	Percentage [(numerator/denominator) x 100]
Measure target and/or threshold	Lower is better
Rationale	Regarding hysterectomy, it is usually recommended when other procedures have failed to control massive bleeding or when they were not indicated. Guidelines highlight that hysterectomy should be performed “sooner rather than later,” before the patient develops coagulopathy.

Antepartum anemia management with supplemental iron

Description Title	Antepartum anemia management with supplemental iron
Definition	Percentage of pregnant women with anemia receiving supplemental iron in addition to prenatal vitamins during the last 12 months
Numerator	Number of pregnant women with anemia receiving supplemental iron in addition to prenatal vitamins during the last 12 months
Denominator	Total number of pregnant women with anemia during the last 12 months
Exclusion criteria	Ectopic pregnancies, Intra-uterine death, patients receiving ant-hypertensives prior to pregnancy
Unit of measure	Percentage [(numerator/Denominator) x 100]
Measure target and/or threshold	Higher the better
Rationale	Pregnant women with iron deficiency anemia should be treated with supplemental iron, in addition to prenatal vitamins.

Intrapartum severe anemia management with red cell transfusion

Description title	Intrapartum severe anemia management with red cell transfusion
Definition	Percentage of pregnant women with severe anemia (hb < 6 g/dl) during delivery receiving red cells transfusion in the last 12 months
Numerator	Number of pregnant women with severe anemia (hb < 6 g/dl) during delivery receiving red cells transfusion in the last 12 months
Denominator	Total pregnant women with severe anemia (hb < 6 g/dl) admitted to the hospital for delivery in the last 12 months
Exclusion criteria	Ectopic pregnancy, miscarriage, abortions, hospitalizations not related to pregnancy related medical conditions
Unit of measure	Percentage [(numerator/denominator) x 100]
Measure target and/or threshold	Higher the better
Rationale	Iron supplementation decreases the prevalence of maternal anemia at delivery. Transfusions of red cells seldom are indicated unless hypovolemia from blood loss coexists, or an operative delivery must be performed on a patient with anemia. Severe anemia with maternal hb levels < 6 g/dl has been associated with abnormal fetal oxygenation, resulting in altered fetal heart rate patterns, reduced amniotic fluid volume, fetal cerebral vasodilatation, and fetal death. Thus, maternal transfusion should be considered for fetal indications in cases of severe anemia.

Hormonal Contraceptives for High-Risk Patient Populations with contraindications to pregnancy

Description Title	Prescription for Hormonal Contraceptive for High-Risk Patient Populations
Definition	Percentage of High-Risk patients in age group 15-45 years with contraindication to pregnancy (severe cardiac diseases, chronic disorders like diabetes mellitus with renal failure, and malignancies requiring chemotherapy or radiation therapy, auto immune diseases, blood clotting disorders, respiratory diseases, and patients on teratogenic medications) who are on hormonal contraceptives.
Numerator	Number of High-Risk patients in age group 15-45 years with contraindication to pregnancy (severe cardiac diseases, chronic disorders like diabetes mellitus with renal failure, and malignancies requiring chemotherapy or radiation therapy, auto immune diseases, blood clotting disorders, respiratory diseases, and patients on teratogenic medications) who are on hormonal contraceptives.
Denominator	Total number of High-Risk patients in age group 15-45 years with contraindication to pregnancy (severe cardiac diseases, chronic disorders like diabetes mellitus with renal failure, and malignancies requiring chemotherapy or radiation therapy, auto immune diseases, blood clotting disorders, respiratory diseases, and patients on teratogenic medications)
Exclusion criteria	Patients not in childbearing age group, pregnant women with high-risk conditions
Unit of measure	Percentage [(numerator/Denominator) x 100]
Measure target and/or threshold	Higher the better
Rationale	In addition to family planning, hormonal contraceptives can be prescribed for women with certain medical conditions where pregnancy poses significant risks to their health. These conditions include severe cardiac diseases, chronic disorders, and other health complications that may worsen during pregnancy. The contraceptive implant is a popular and effective form of long-acting reversible contraception (LARC). Provides at least 3-year continuous pregnancy protection and do not require any attention by users **Severe Cardiac Diseases:** Severe cardiac diseases, such as pulmonary hypertension and severe heart failure, can pose life-threatening risks to both the mother and fetus during pregnancy. In these cases, avoiding pregnancy is crucial to prevent the exacerbation of the underlying cardiac condition and to reduce maternal and fetal morbidity and mortality. Contraceptives offer an effective method for women with severe cardiac diseases to prevent pregnancy and manage associated risks. **Chronic Disorders:** Chronic disorders, including poorly controlled diabetes, lupus with kidney involvement, and severe liver diseases, can significantly impact maternal and fetal health during pregnancy. Women with these conditions may require contraception to minimize pregnancy-related complications and optimize their health outcomes. Contraceptives can help manage pregnancy risks in these cases by providing effective and reliable contraception. Hormonal contraceptives are a valuable tool in managing pregnancy risks for women with severe cardiac diseases and chronic disorders. By preventing pregnancy in these high-risk populations, contraceptives can improve overall health outcomes and reduce the likelihood of pregnancy-related complications. Healthcare providers should carefully assess each patient's medical history, risk factors, and contraceptive needs to determine the most appropriate contraceptive method for their specific circumstances.

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