

# The Iranian Integrated Maternal Health Care Guideline Based on Evidence-Based Medicine and American Guidelines: A Comparative Study

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## Abstract

**Background:** There is a little consistency among prenatal care guidelines. An evidence-based guideline can be used to improve the quality of the mother and child health care. This study was designed to compare the consistency of the Iranian integrated maternal health care guideline with evidence-based prenatal care manuals and American guidelines.

**Methods:** In this comparative study, the Iranian guideline recommendations were compared with the content of American prenatal care according to obstetrics and gynecology recommendations of the U.S. preventive services task force and evidence-based prenatal care. The strength of the recommendations was assessed based on evidence-based medicine.

**Results:** In this study, 71 recommendations were compared in four parts. About 18.3 percent of the recommendations were consistent with all guidelines. Screening for group B streptococcus, performing chorionic villous sampling and amniocentesis for at risk women, and anomaly screening were not mentioned in the Iranian guideline. The Iranian guideline was consistent with the content of U.S. preventive services task force in 38% of the recommendations, American Obstetricians and Gynecologists expert panel guidelines in 75.6% of the recommendations, and with evidence-based care in 66.2% of the recommendations.

**Conclusions:** Although there was a little consistency among guidelines, the Iranian guideline had a good consistency with the American guidelines and evidence-based care recommendations. Updating clinical tests and the prenatal screening part of the Iranian guideline based on the results of this study may increase the effectiveness of the prenatal care and ultimately improve the mother and child's health.

**Keywords:** Prenatal Care, Guideline, Evidence-Based Practice, Comparative Study

## 1. Background

In 2008, about 343,000 mothers died due to pregnancy and childbirth complications (1). Although maternal mortality ratios (MMR) have decreased significantly in recent years, only 25 out of 181 countries are on the way to achieve a 75 percent reduction in MMR by 2015, as one of the millennium development goals (MDG) (1). The incidence of maternal morbidity is much higher than the incidence of maternal mortality (2). Lynch et al. (3) showed that severe maternal morbidity occurs 26.5 times more than mortality in a developed country. Many maternal deaths, stillbirths, preterm births, and low birth weight cases are associated with inadequate prenatal care; therefore, by using adequate prenatal care, future complications can be reduced (4). The benefits of prenatal care may spread throughout

the maternal life from one pregnancy to the next or even to the next generations (5).

Pregnancy is a physiological process in the human life; thus, any intervention should have well-known benefits for pregnant women and should also be acceptable. Prenatal care should enable women to make informed decisions based on their needs and discuss all their concerns with health care professionals. Prenatal care guidelines can help identify the best interventions for all uncomplicated normal pregnancies in primary health care settings and provide evidence-based information for health care professionals and pregnant women in special situations (6). There is not sufficient evidence about the effectiveness of the Iranian prenatal care guideline, but Tayebi et al. (7) showed that inadequate prenatal care caused 36% increase in the preterm labor rate and 8% increase in the low birth

weight rate.

The results of applied research are employed in the clinical practice through knowledge translation as clinical guidelines to be used by medical and health professionals. This approach increases the application of evidence-based medicine in policy and decision making. It also can change attitude, practice, and behavior of health system organizations in the direction of knowledge-based health system. The final users of these services are clients (8). There are multiple guidelines for prenatal care in different countries, but these guidelines are not consistent in many recommendations (9, 10). Moreover, in many cases, documented evidence in medical research is not used in clinical practice (11).

A comparative study is a research methodology or process in which two or more variables are assessed to describe and explain the similarities and differences of data in order to achieve probable new interpretations and generalizations (12). Prenatal care guidelines have been compared in different countries by using this method (9, 10).

In Iran, the Iranian integrated maternal health care guideline is a guide for midwives and general practitioners in the health care centers. The cares start before pregnancy and continues during the pregnancy and postpartum periods (13). Despite little consistency among prenatal care guidelines, no study has assessed the consistency of the Iranian guideline with the available evidence, yet. According to our previous study, American pregnancy surveillance systems were the most appropriate ones for being adapted in Iran (14), so these guidelines could be appropriate for comparative assessment of Iranian prenatal guideline.

## 2. Objectives

This study aimed to determine the consistency of the Iranian protocol with evidence-based prenatal care manuals and American guidelines.

## 3. Methods

In this comparative study, "The Iranian national program on safe motherhood, integrated care on mother's health" (13) was compared to "caring for our future: the content of prenatal care: a report of the public health service expert panel on the content of prenatal care" (15), "The guide to clinical preventive Services, recommendations of the U.S. preventive services task force" (16), and "Evidence-based prenatal care, Part I: General prenatal care and counseling issues", "part II: Third-trimester care and prevention of infectious policy", and "prenatal screening for down syndrome, trisomy 18 and open neural tube" (17-19).

The method used by Haertsch et al. (10) was applied to provide a list of recommended interventions in prenatal care. All protocols were studied and compared as follows. Recommended interventions for low-risk pregnancies were included and the recommendations for high-risk pregnancies such as multiple pregnancies, Rh Isoimmunization, and other risk factors were excluded. There were 71 recommendations in four parts including: general health screening and health promotion, prenatal care organization, clinical tests and prenatal screening, and special education for pregnancy.

Specific recommendations were integrated with more general recommendations whenever possible, and the details were described in the table footnotes if integration was not possible. The recommended time of interventions was described as preconception, first, second, and third trimester, throughout the pregnancy or without a specific time. For example, the code 1 indicated that the recommendation should be performed in the first trimester. In the Iranian guideline, preconception care is integrated with prenatal care; therefore, the code 0 was used for recommendations in this period. The time was specified in most of the recommended interventions.

Finally, the strength of the recommendations was determined by the labels A, B, and C when the recommendations were based on evidence-based medicine (17-19); label A indicated that the recommendation was based on consistent, good-quality patient-oriented evidence; label B indicated that the recommendation was based on inconsistent or limited-quality patient-oriented evidence; and label C indicated that the recommendation was based on consensus, disease-oriented evidence, usual practice, opinion, or case series (20). This study was approved and funded by Deputy of research and technology, Shahroud University of Medical Sciences (Code: 92168)

## 4. Results

Overall, 71 recommendations were extracted and compared. They were divided into four parts as follows: 20 in general health screening and health promotion, 6 in prenatal care organization, 37 in clinical tests and prenatal screening and 8 in special education for pregnancy.

### 4.1. Details of Different Parts of Protocols

Tables 1 to 4 show detailed comparisons between the guidelines. All label A and B evidence-based recommendations were mentioned in the Iranian guideline. Level C recommendations that were not mentioned in the Iranian guideline, included the following: discussion about exercise patterns in Table 1, collection of menstrual and gynecological data in Table 2, and collection of obstetric data in Table 3.

cological history, determination of blood group antibodies, screening for group B streptococcus, performing CVS and amniocentesis for high risk women and screening for 13, 18 and 21 trisomies in [Table 3](#), and education about future tests in [Table 4](#). All evidence-based recommendations in [Table 2](#) were mentioned in the Iranian guideline.

#### 4.2. Consistency of Recommendations Between Protocols

For “health screening and health promotion during pregnancy”, 3 recommendations were not included in any of the protocols and three protocols had 40% consistent recommendations. Also for “prenatal care organization”, two protocols had 50% consistent recommendations. Regarding “clinical tests and prenatal screening”, three protocols had 32.4% consistent recommendations, and for “special education for pregnancy”, two protocols had 37.5% consistent recommendations. In total, 33.8% of the recommendations were consistent among the three protocols and only 13 out of 71 recommendations (18.3% of the recommendations) were present in all four protocols ([Table 5](#)). The last three columns of the [Table 5](#) demonstrate the consistency of the Iranian guideline with other protocols. The Iranian guideline was consistent with evidence-based care and American Obstetricians and Gynecologists expert panel in 80% of the cases in “health screening and health promotion”. It was consistent with American Obstetricians and Gynecologists expert panel in 66.6% of the cases in “prenatal care organization” and in 75.7% of the cases in “clinical tests and prenatal screening”.

The Iranian guideline was consistent with evidence-based care and American obstetricians and gynecologists expert panel in “special education for pregnancy” in 62.5% of the cases. In total, the Iranian guideline was consistent with American obstetricians and gynecologists expert panel in 74.6% of cases and with evidence-based care in 66.2% of cases.

## 5. Discussion

The results of this study showed that 18.3% of recommendations were consistent in all 4 protocols, and the Iranian guideline in more than 60% of the recommendations was consistent with American obstetricians and gynecologists expert panel and evidence-based care. There were all labels A and B evidence-based recommendations in the Iranian guideline, although there were not some label C scientific based recommendations.

Despite the fact that protocols contained similar recommendations in some cases, there were differences in their details. For example, the number of prenatal visits was specified in four protocols, but varied from 7 to 11

visits. In the Iranian guideline, 8 visits have been recommended. Some studies have reported the number of prenatal care visits has no effect on reducing perinatal mortality and costs; therefore, the number of prenatal care visits has reduced in some protocols. However, recent studies indicate that it may cause complications for mother and fetus. More frequent prenatal care visits make it possible to find more cases with complications that occur in the third trimester of pregnancy, such as preeclampsia, fetal growth restriction, and unexplained fetal death ([21, 22](#)).

Although the use of evidence-based perinatal care can be effective ([23](#)), prenatal education has not been well researched in the studies. Also, contrary to the advice of existing evidence, education does not have woman-centered focus, thus behavior changes do not seem to be fit. Education in the prenatal care could provide opportunities for health promotion and harm reduction, which have long-term impact on healthy behaviors of the mother and her family. Guidelines have clearly defined the time of offering many educations but it is important that issues related to protection, comfort, curiosity, health, and welfare of women be offered in a systematic manner to ensure emphasizing them throughout pregnancy ([24-26](#)). In many parts of the world, education programs are emphasized in group or individual sessions, but Gagnon and Sandall in a Cochrane review published in 2007 demonstrated that high quality evidence did not exist for some educational needs of women such as birth and parenting ([27](#)). In the Iranian guideline, educational needs of women have been considered, but it could have more details such as the use of safety belt.

The reason for different prenatal care recommendations in different protocols can be related to the different bases of protocols; for example, some protocols are based on study results ([16-19](#)) and others are based on expert opinions ([13, 15](#)). Moreover, differences in economic status and healthcare systems of countries as well as publication dates may play important roles in this regard. We require strategies that consider economy, clients, and the country’s circumstances to develop consistent and evidence-based recommendations for health care professionals. Such guidelines will help the community, clinicians, governmental agencies, and research bodies to provide consistent performance, to reduce inappropriate interventions, and to improve the efficiency and effectiveness of the prenatal care ([10](#)).

The Iranian guideline was in good agreement with the principles of American Obstetricians and Gynecologists expert panel and evidence-based care, which is one of the strong points of this protocol and indicates the applicability of this protocol based on research evidence; however, some evidence-based recommendations did not involve in

**Table 2.** Comparison of Prenatal Care/Organization<sup>a,b</sup>

Recommendations	Iranian Guideline 2010	American Expert Panel 1989	American Task Force 2012	Evidence-Based Care, 2005-2011	Strength of Evidence
Mothers should carry the record	4	-	-	-	-
Offer induction after 41 weeks of pregnancy	3 <sup>c</sup>	-	-	3	A
Prenatal course should be written in the record	0 and 4	4	-	-	-
Refer for complications of pregnancy including referral to a dentist or hospital	0 and 4	4	-	-	-
Prenatal visits	4 <sup>d</sup>	4 <sup>e</sup>	-	4 <sup>f</sup>	B
Describe prenatal care that midwives, general practitioners, and obstetricians can provide	0 and 4	4	-	4	A

<sup>a</sup> 0 = preconception; 1 = first trimester; 2 = second trimester; 3 = third trimester; 4 = through the pregnancy; 5 = time and frequency is not specified; - = not mention it in the protocol.

<sup>b</sup> A, consistent, good-quality patient-oriented evidence; B, inconsistent or limited-quality patient-oriented evidence; C, consensus, disease-oriented evidence, usual practice, opinion, or case series.

<sup>c</sup> After 41 weeks of pregnancy, the mother is referred.

<sup>d</sup> 8 visits for multiparous and nulliparous women.

<sup>e</sup> 8 visits for nulliparous and 6 visits for multiparous women until 40 weeks of pregnancy

<sup>f</sup> 7 to 11 visits.

**Table 4.** Comparison of Special Education for Pregnancy<sup>a</sup>

Recommendations	Iranian Guideline 2010	American Expert Panel 1989	American Task Force 2012	Evidence-Based Care, 2005-2011	Strength of Evidence
Changes in pregnancy and discomfort	4	4	-	-	-
Breastfeeding	2 and 3	2 and 3	4	5	B
Labor and birth plans	4	2 and 3	-	5	C
Birth education Classes	4	2 and 3	-	-	-
Future tests	-	-	-	5	C
Symptoms, complications, and risks report	4	4	-	-	-
The use of safety belts	-	2 <sup>b</sup>	-	-	-
Encouraging women to seek information on pregnancy and birth	-	4	-	-	-

<sup>a</sup> 0 = preconception; 1 = first trimester; 2 = second trimester; 3 = third trimester; 4 = through the pregnancy; 5 = time and frequency is not specified; - = not mention it in the A, consistent, good-quality patient-oriented evidence; B, inconsistent or limited-quality patient-oriented evidence; C, consensus, disease-oriented evidence, usual practice, opinion, or case series.

<sup>b</sup> Including infant car safety.

the Iranian protocol, which can be due to some differences in culture, health care systems, or medical education systems between Iran and the US. It seems that economic considerations play a role in not recommending some interventions such as screening for group B streptococcus, performing CVS, and amniocentesis for at risk women and screening for 13, 18, and 21 trisomies. Lack of skilled labora-

tory personnel for triple and quad marker screening tests, equipment, and also skilled radiologists for measuring fetal neck thickness may also play a role in the absence of these recommendations. If the costs of the recommendations are covered by the insurance systems and the laboratory personnel and radiologists receive necessary training, adding these tests increases the value of the proto-

**Table 5.** Comparison of Consistency of Recommendations Among Prenatal Care Protocols and the Consistency of the Iranian Guideline With Other Protocols<sup>a</sup>

Recommendation parts	Total Recommendations	Zero Protocol	One Protocol	Two Protocols	Three Protocols	Four Protocols	American Expert Panel 1989	American Task Force 2012	Evidence-Based Care, 2005-2011
General health screening and health promotion	20	3 (15)	2 (10)	3 (15)	8 (40)	4 (20)	16 (80)	11 (55)	16 (80)
Prenatal care/organization	6	0	1 (16.7)	3 (50)	2 (33.3)	0	4 (66.6)	0	3 (50)
Clinical tests and prenatal screening	37	0	7 (18.9)	10 (27)	12 (32.4)	8 (21.6)	28 (75.7)	12 (32.4)	23 (62.2)
Special education for pregnancy	8	0	2 (25)	3 (37.5)	2 (25)	1 (12.5)	5 (62.5)	4 (50)	5 (62.5)
<b>Total</b>	<b>71</b>	<b>3 (4.2)</b>	<b>12 (16.9)</b>	<b>19 (26.7)</b>	<b>24 (33.8)</b>	<b>13 (18.3)</b>	<b>53 (74.6)</b>	<b>27 (38)</b>	<b>47 (66.2)</b>

<sup>a</sup>Values are expressed as No. (%).

col. Also, adding other recommendations including discussions about the pattern of exercise, rest, and sleep can result in better pregnancy outcomes. Updating the protocol at regular intervals based on the results of the latest studies, particularly on the basis of epidemiological surveillance systems in pregnancy, could increase the effectiveness of the prenatal care and ultimately improve the health of the mother and child.

### 5.1. Conclusion

The Iranian guideline had a good agreement with the evidence-based care recommendations. However, recommendations about screening for group B streptococcus, performing chorionic villous sampling and amniocentesis for at risk women, and anomaly screening were not included in Iranian protocol, which can be due to differences in culture, health care systems, or medical education systems between Iran and other countries. Updating clinical tests and some parts of the Iranian guideline such as the prenatal screening part at regular intervals based on the results of recent studies may increase the effectiveness of the prenatal care. Also, the establishment of pregnancy and child birth surveillance system is an essential component of evidence-based decision making system in this area, and could provide valuable maternal and child health information for updating the guideline (28). Therefore, it is highly recommended for health planners and policy makers to develop such surveillance system in Iran.

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Table 1. Comparison of the Health Screening and Health Promotion During Pregnancy<sup>a,b</sup>

Recommendations	Iranian Guideline 2010	American Expert Panel 1989	American Task Force 2012	Evidence-Based Care, 2005 - 2011	Strength of Evidence
Job and income security assessment (including the socioeconomic risks of household size, level of financial resources and support network)	-	1	-	-	-
Occupational and environmental risk assessment (job, prolonged standing, exposure to chemicals and radiation)	0 and 1	1	-	1	B
Psychological risk assessment (major life events, stress and anxiety, domestic violence, and mental illness)	0 and 1	1	1	-	-
Folic acid supplementation (0.4 to 0.8 mg per day, one to three months before pregnancy)	0 and 4	-	0 and 4	0 and 1	A
Maternal medical history collection (history of chronic diseases, trauma, blood transfusions, infections, and previous surgeries)	0 and 1	1	-	-	-
General physical examination	0 and 1 <sup>c</sup>	1 <sup>d</sup>	-	1	A
Height measurement	0 and 1	1	-	1	B
Weight measurement	0 and 4	4	-	1	B
Varicose veins examination	-	-	-	-	-
Teeth and gums examination	0, 1 and 2	1	-	-	-
Nutritional needs assessment or providing information about them	4	4 <sup>e</sup>	-	5	A
Use of tobacco assessment	4	4	5	5	A
Advice for reducing sexually transmitted infections, including HIV	0 and 4	4	5	5	A
Child's health history collection	-	1	-	-	-
Pap Smear	0	1	-	1	B
Alcohol drinking assessment	0 and 4	1	1	1	B
Offer HIV testing	0 and 1	1	1	1 and 3	B
Discussion about:					

Exercise pattern (to avoid the risk of falls or injuries to the abdomen and recommendation of 30 minutes of moderate activity)	-	1	-	1	C
Sleep pattern (7 to 9 hours of sleep per night)	-	-	-	1	C
Rest pattern (on the left side of the body to help fetal circulation and avoid fetal distress and putting a pillow under the lower back and legs)	1	-	-	-	-

<sup>a</sup>0 = preconception; 1 = first trimester; 2 = second trimester; 3 = third trimester; 4 = through the pregnancy; 5 = time and frequency is not specified; - = not mention it in the protocol.

<sup>b</sup>A, consistent, good-quality patient-oriented evidence; B, inconsistent or limited-quality patient-oriented evidence; C, consensus, disease-oriented evidence, usual practice, opinion, or case series.

<sup>c</sup>Including heart, lung, thyroid, breast, liver, spleen, and lower extremities.

<sup>d</sup>Including heart and lung.

<sup>e</sup>Identifying the barriers to adequate nutrition.

Table 3. Comparison of Clinical Tests and Prenatal Screening<sup>a,b</sup>

Recommendations	Iranian Guideline 2010	American Expert Panel 1989	American Task Force 2012	Evidence-Based Care, 2005 - 2011	Strength of Evidence
Allergies history collection	1	1	-	-	-
Breast examination	0 and 1	1	-	-	-
discussion about use of prescribed or non-prescribed medicines	1	1	-	1	C
previous pregnancy and/or birth events history Collection (multiple pregnancies, preeclampsia or history that may increase morbidity and mortality)	0 and 1	1	-	1	C
Menstrual and gynecological history collection	-	1	-	1	C
Details of previous use of contraceptive pills history collection	0 and 1	1	-	1	C
Family history of congenital anomalies	0 and 1	1	-	1	C
History of medical problems	0 and 1	1	-	1	C
Blood pressure measurement	0 and 4	4	4	4	C
Bimanual examination	0 and 3 <sup>c</sup>	1	-	-	-
Vaginal and cervical examination after 40 weeks of pregnancy	3 <sup>c</sup>	3	-	-	-
Va Vaginal and cervical infection screening	-	1 <sup>d,e</sup>	1 <sup>f</sup>	-	-
Clinical pelvimetry	3 <sup>c</sup>	1	-	-	-
Hemoglobin assessment	0, 1 and 3	1 and 2	1	1	B
Syphilis serology determination	0 and 1 <sup>g</sup>	1 and 3	1	1 and 3	A
If there is no evidence of immunization, determine rubella antibodies status	0	1	-	1	C
Hepatitis B status	0 and 1 <sup>h</sup>	1	1	1	A
Blood group and Rh factor assurance	0 and 1	1	1	1	C
Blood group antibodies screening	-	1	1	1	C
Rh antibody screening for Rh negative women	1 and 3 <sup>h,i</sup>	2 <sup>i</sup>	2	3 <sup>i</sup>	C
Ultrasonography	0, 1 and 3	-	-	1 and 2	B
Maternal Alpha Fetoprotein assessment	-	2	-	-	-
Asymptomatic bacteriuria screening	1	1	1	1	A

<b>Gestational diabetes Screening</b>	1 <sup>i</sup> , 3	2	2 <sup>j</sup>	2 <sup>h</sup>	C
<b>Group B Streptococcus screening</b>	-	-	-	3	C
<b>Urine analysis for nitrates</b>	0, 1 and 3	-	-	-	-
<b>Urine analysis for glucose</b>	0, 1 and 3	1	-	4	C
<b>Urine analysis for specific gravity</b>	0, 1 and 3	-	-	-	-
<b>Urine analysis for protein</b>	0, 1 and 3	1	-	4	C
<b>Palpation of the abdomen to assess the uterine</b>	3 <sup>c</sup>	-	-	4	B
<b>Palpation of the abdomen to assess the fetal presentation</b>	3 <sup>c</sup>	2 and 3	-	3	B
<b>Palpation of the abdomen to assess fetal growth or Uterus height</b>	2 and 3	2 and 3	-	4	B
<b>The number of fetal movements count</b>	-	-	-	4 <sup>k</sup>	A
<b>Fetal heart sounds Listening</b>	2 and 3	2 and 3	-	4	C
<b>Cervix checking after 40 weeks of pregnancy</b>	3 <sup>c</sup>	3	-	-	-
<b>Screening for trisomies 13, 18, and 21 using multiple tests</b>	-	-	-	1 and 2	C
<b>Chorionic villus sampling (CVS) and amniocentesis</b>	-	-	-	1 <sup>l</sup>	C

<sup>a</sup> 0 = preconception; 1 = first trimester; 2 = second trimester; 3 = third trimester; 4 = through the pregnancy; 5 = time and frequency is not specified; - = not mention it in the protocol.

<sup>b</sup> A, consistent, good-quality patient-oriented evidence; B, inconsistent or limited-quality patient-oriented evidence; C, consensus, disease-oriented evidence, usual practice, opinion, or case series.

<sup>c</sup> At the hospital.

<sup>d</sup> Gonorrhea screening.

<sup>e</sup> Chlamydia screening for women in endemic or high risk groups.

<sup>f</sup> Chlamydia screening for adolescents and women in high risk groups.

<sup>g</sup> In women in high risk groups.

<sup>h</sup> Unsensitized Rh-negative women should receive Rh immune globulin at 28 to 34 weeks of pregnancy, or in any bleeding situation such as abortion, mole, etc.

<sup>i</sup> Unsensitized Rh-negative women should receive Rh immune globulin if the baby is Rh-positive.

<sup>j</sup> In high risk women including age > 25 years, obesity: BMI > 30, ethnicity: Hispanic, Asian, African-American, family history: first degree relative, and previous GDM.

<sup>k</sup> Should not be done.

<sup>l</sup> They are not recommended without prior non-invasive screening except for women  $\geq$  40 years at expected date of delivery, women at risk of having a baby with chromosomal abnormalities (Down syndrome or trisomy 18 or have a personal or family history or women who had ICSI for getting pregnant) and women with multiple gestations who are  $\geq$  35 years old at expected date of delivery.