human reproduction programme hrp
research for impact
UNDP · UNFPA · UNICEF · WHO · WORLD BANK

World Health Organization

WHO antenatal care recommendations for a positive pregnancy experience

Maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy

WHO antenatal care recommendations for a positive pregnancy experience

Maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy

human reproduction programme hrp
research for impact
UNDP·UNFPA·UNICEF·WHO·WORLD BANK

World Health Organization

WHO antenatal care recommendations for a positive pregnancy experience. Maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy

ISBN 978-92-4-004600-9 (electronic version)
ISBN 978-92-4-004601-6 (print version)

Suggested citation. WHO antenatal care recommendations for a positive pregnancy experience. Maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.

Cataloguing-in-Publication (CIP) data. CIP data are available at http://apps.who.int/iris.

Design and layout by Green Ink.

Contents

Acknowledgements

The Department of Sexual and Reproductive Health and Research (SRH) and the Department of Maternal, Newborn, Child and Adolescent Health and Ageing (MCA) of the World Health Organization (WHO) gratefully acknowledge the contributions that many individuals and organizations have made to the updating of this guideline recommendation.

María Barreix, Maurice Bucagu, Doris Chou, Olufemi Oladapo and Özge Tunçalp are the members of the WHO Steering Group who managed the guideline development process. The members of the Guideline Development Group (GDG) included Niveen Abu-Rmeileh, Mario Festin, Atf Ghérissi, Gill Gyte, Tippawan Liabsuetrakul, James Neilson, Lisa Noguchi, Nafissa Osman, Erika Ota, Tomas Pantoja, Robert Pattinson, Charlotte Warren and Charles Shey Wiysonge. James Neilson served as chair of the GDG. WHO thanks members of the External Review Group, including Lorena Binfa, Tamar Kabakian-Khasholian, Bhavya Reddy and Petr Velebil.

WHO would also like to thank, for their collaboration, the authors of the Cochrane systematic review used, and Frances Kellie and Leanne Jones, who facilitated this collaboration process. Soo Downe, Kenneth Finlayson and Gillian Moncrieff performed the qualitative reviews that informed the values, equity, acceptability and feasibility criteria of the evidence-to-decision (EtD) framework and graded this qualitative evidence. Therese Dowswell and Theresa Lawrie, with members of the WHO Steering Group, synthesized and reviewed the evidence and drafted the EtD framework and the final guideline document.

WHO acknowledges the various organizations that were represented by observers at the technical consultation, including: Deborah Armbruster and Mary Ellen Stanton of the United States Agency for International Development (USAID); Anwar Nassar of the International Federation of Gynecology and Obstetrics (FIGO); Liona Poon of the International Society of Ultrasound in Obstetrics and Gynecology (ISUOG); Jeffrey Smith of the Bill & Melinda Gates Foundation; Petra ten Hoope-Bender of the United Nations Population Fund (UNFPA); and Anne Yates of the International Confederation of Midwives (ICM).

WHO appreciates the contributions of WHO regional office staff to this update: Nino Berdzuli, Bremen De Mucio, Karima Gholbzouri, Anoma Jayathilaka, Nancy Kidula and Howard Sobel.

Funding was provided for this updated recommendation by USAID and the UNDP-UNFPA-UNICEF-WHO-World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP). Donors do not fund specific guidelines and do not participate in any decision related to the guideline development process, including the composition of research questions, membership of the guideline groups, conduct and interpretation of systematic reviews, or formulation of recommendations.

Acronyms and abbreviations

ANC	antenatal care
CI	confidence interval
DECIDE	Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence
DOI	declaration of interest
ERG	External Review Group
EtD	evidence-to-decision
FIGO	International Federation of Gynecology and Obstetrics
GDG	Guideline Development Group
GRADE	Grading of Recommendations Assessment, Development and Evaluation
GRADE-CERQual	Confidence in the Evidence from Reviews of Qualitative research
GSG	Guideline Steering Group
LMIC	low- and middle-income country
MCA	Department of Maternal, Newborn, Child and Adolescent Health and Ageing (at WHO)
PICO	population, intervention, comparator, outcome
RCT	randomized controlled trial
RR	risk ratio
SRH	Department of Sexual and Reproductive Health and Research (at WHO)
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
US$	United States dollar
USAID	United States Agency for International Development
WHO	World Health Organization

Executive summary

Evidence from a Cochrane systematic review on imaging ultrasound conducted before 24 weeks of pregnancy was evaluated as part of the World Health Organization (WHO) antenatal care guideline development process in 2016. The following recommendation was made by WHO: "One ultrasound scan before 24 weeks of gestation (early ultrasound) is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience".

The evidence on effectiveness that supported this recommendation was derived from high-income countries. Since the publication of the Cochrane review, the findings of a large cluster-randomized trial of an antenatal ultrasound intervention in low-income countries have been published; therefore, this recommendation was prioritized by the Executive Guideline Steering Group (GSG) for updating.

In March 2021, a WHO-convened Guideline Development Group (GDG) re-evaluated evidence on imaging ultrasound before 24 weeks of pregnancy, updating the recommendation on this intervention in accordance with the WHO Department of Sexual and Reproductive Health and Research (SRH) living guidelines approach.[1]

Target audience

The target audience of this updated recommendation includes national and local public health policy-makers, implementers and managers of national and local maternal and child health programmes, concerned nongovernmental and other organizations, professional societies involved in the planning and management of maternal and child health services, health workers (including obstetricians, midwives, nurses and general medical practitioners), and academic staff involved in training health workers.

Guideline development methods

The updating of this recommendation was guided by the standardized operating procedures described in the *WHO handbook for guideline development*. This involved: (i) identification of the priority question and outcomes (done as part of the antenatal care [ANC] guideline development process); (ii) evidence retrieval and synthesis; (iii) assessment of the evidence; (iv) formulation of the recommendation; and (v) planning for the dissemination, implementation, impact evaluation and updating of the recommendation. The scientific evidence supporting the recommendation was assessed using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) and Confidence in the Evidence from Reviews of Qualitative research (GRADE-CERQual) approaches, for quantitative and qualitative evidence, respectively. An up-to-date systematic review was used to prepare an evidence profile for the recommendation prioritized for updating. The Developing and Evaluating Communication strategies to support Informed Decisions and practice based on Evidence (DECIDE) framework – an evidence-to-decision tool that considers research evidence on interventions according to the six criteria of effects, values, resources, equity, acceptability and feasibility – was used to guide the formulation and approval of the recommendation by the GDG, an international group of experts that was convened for this process, during an online GDG meeting on 22 June 2021.

Recommendations

The WHO meeting led to the retention of the 2016 recommendation on imaging ultrasound before 24 weeks of pregnancy (Table 1). The GDG had the option to recommend the intervention, not to recommend the intervention, or to recommend the intervention under certain conditions (in specific contexts, with targeted monitoring and evaluation, in the context of rigorous research). For this update, the GDG elaborated on the implementation considerations to facilitate appropriate implementation of the recommendation. Users of the guideline should refer to these considerations, as well as the GDG remarks and the evidence summary, for further information about the basis of this WHO recommendation.

This recommendation applies to pregnant women and adolescent girls within the context of routine ANC.

1 Vogel JP, Dowswell T, Lewin S, Bonet M, Hampson L, Kellie F, et al. Developing and applying a "living guidelines" approach to WHO recommendations on maternal and perinatal health. BMJ Glob Health. 2019;4(4):e001683. doi:10.1136/bmjgh-2019-001683.

Table 1. WHO recommendation on imaging ultrasound before 24 weeks of pregnancy

One ultrasound scan before 24 weeks of gestation is recommended for pregnant women to estimate gestational age, improve detection of fetal anomalies and multiple pregnancies, reduce induction of labour for post-term pregnancy, and improve a woman's pregnancy experience.
Remarks

- The evidence on effects of routine imaging ultrasound before 24 weeks of pregnancy has not changed materially since the 2016 recommendation. A newly identified large-cluster randomized controlled trial (RCT) conducted in low-resource settings was reviewed but was not found suitable for inclusion in meta-analysis, because it evaluated the effect of two imaging ultrasounds conducted in both the second and third trimesters (i.e. it did not address the guideline's participants, intervention, comparator, outcome [PICO] question).
- Implementation considerations associated with this recommendation have been significantly expanded based on the findings of a new qualitative evidence synthesis of the views and experiences of service users and health workers.[a]
- Ultrasound scan can guide subsequent care. When implementing or scaling up routine imaging ultrasound before 24 weeks of pregnancy, the purpose of imaging ultrasound should be to assess:
  - location of pregnancy (e.g. intrauterine)
  - cardiac activity
  - fetal size
  - gestational age
  - fetal number
  - chorionicity and amnionicity for multiple gestation.
- Where the skill set and health systems allow, the following, which are more informative after 18 weeks of pregnancy, may also be assessed:
  - presence of normal head, neck, face, spine, chest, heart, abdomen, abdominal wall and extremities
  - placental appearance and location, and umbilical cord.
- Those who perform obstetric ultrasound should have specialized training that is appropriate to the practice of screening ultrasound in pregnancy.
- Many pregnancy complications, including fetal malformations, may develop later in pregnancy or may not be detectable without appropriate ultrasound training and equipment.
- There remain some uncertainties around undesirable effects, including the risk of litigation, the potential for female feticide, the short- and long-term psychological impact of an inconclusive or adverse scan finding, and the potential for overuse of ultrasound scans (as a replacement for formal ANC contacts).

a Moncrieff G, Finlayson K, Cordey S, McCrimmon R, Harris C, et al. First and second trimester ultrasound in pregnancy: a systematic review