Complete Summary

GUIDELINE TITLE

Gynaecological ultrasound examination.

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Gynaecological ultrasound examination. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2005 May 4 [Various].

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Palo P. Gynaecological ultrasound examination. In: EBM Guidelines. Evidence-Based Medicine [CD-ROM]. Helsinki, Finland: Duodecim Medical Publications Ltd.; 2004 Apr 14 [Various].

COMPLETE SUMMARY CONTENT

SCOPE
METHODOLOGY - including Rating Scheme and Cost Analysis
RECOMMENDATIONS
EVIDENCE SUPPORTING THE RECOMMENDATIONS
BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS
QUALIFYING STATEMENTS
IMPLEMENTATION OF THE GUIDELINE
INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES
IDENTIFYING INFORMATION AND AVAILABILITY
DISCLAIMER

SCOPE

DISEASE/CONDITION(S)

- Infertility, including ovarian hyperstimulation syndrome during infertility treatment
- Functional bleeding disorders of hormonal origin
- Endometrial polyp
- Submucotic myoma
- Postmenopausal bleeding disorders
- Gynecologic tumors, such as myoma, adenomyosis, endometrial cancer, ovarian cysts, endometrioma, and dermoid tumors
- Pelvic infections

- Other conditions resembling ovarian masses on ultrasound

GUIDELINE CATEGORY

Diagnosis
Evaluation

CLINICAL SPECIALTY

Family Practice
Internal Medicine
Obstetrics and Gynecology
Oncology

INTENDED USERS

Health Care Providers
Physicians

GUIDELINE OBJECTIVE(S)

Evidence-Based Medicine Guidelines collect, summarize, and update the core clinical knowledge essential in general practice. The guidelines also describe the scientific evidence underlying the given treatment recommendations.

TARGET POPULATION

Women with gynecologic disorders for which ultrasound examination may be useful in diagnosis, evaluation, or follow-up

INTERVENTIONS AND PRACTICES CONSIDERED

Gynaecologic ultrasound examination, including:

1. Transvaginal sonography
2. Transabdominal sonography

MAJOR OUTCOMES CONSIDERED

Sensitivity and specificity of endovaginal ultrasound for detecting endometrial cancer or other endometrial diseases

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Hand-searches of Published Literature (Primary Sources)
Hand-searches of Published Literature (Secondary Sources)
Searches of Electronic Databases

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

The evidence reviewed was collected from the Cochrane database of systematic reviews and the database of abstracts of reviews of effectiveness (DARE). In addition, the Cochrane Library and medical journals were searched specifically for original publications.

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

A. Strong research-based evidence. Multiple relevant, high-quality scientific studies with homogenic results.
B. Moderate research-based evidence. At least one relevant, high-quality study or multiple adequate studies.
C. Limited research-based evidence. At least one adequate scientific study.
D. No research-based evidence. Expert panel evaluation of other information.

METHODS USED TO ANALYZE THE EVIDENCE

Systematic Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of evidence [A-D] supporting the recommendations are defined at the end of the "Major Recommendations" field.

Introduction

To perform gynaecological ultrasound (US) examinations a general practitioner must receive training under specialist guidance, acquire sufficient experience, and have proper equipment at his/her disposal.

Equipment

- The improved resolution of ultrasound equipment brought about by improvements in transducer technology and computer capacity for image processing, combined with concurrent reductions in the cost of equipment, has made US a routine gynaecological examination. In skilled hands it yields important information.
- Gynaecological ultrasound investigation consists of both a transvaginal sonography (TVS) and a transabdominal sonography (TAS) (Smith-Bindman et al, 1998; DARE-989095, 2000) **[A]**. A gynaecological US examination is not recommended if a transvaginal probe is not available. On the other hand, large pelvic tumours may be missed if only TVS is carried out, since the resolution of high-frequency vaginal probes remains good only up to the depth of 60 to 80 mm.
- The patient's bladder should usually be empty as this allows easy transvaginal examination of the ovaries and the uterus (large tumours can be seen with an abdominal probe even if the patient has an empty bladder). A full bladder is used as an "acoustic window" when examining children, young women with an intact hymen, or very old patients. Rectal ultrasound examination may also be carried out if the transvaginal approach is not possible.

Menstrual Cycle and Infertility

Endometrial Development

- The cyclic changes of the endometrium during the menstrual cycle can be imaged with US. If the uterus is stretched, the imaging of the endometrium is not always successful.
- The thickness of the endometrium usually is expressed as the double wall thickness including both the anterior and posterior endometrial walls.
- Immediately after menstruation the endometrium is homogenous, 1 to 4 mm thick. As the oestrogen concentration rises, the proliferative endometrium

changes into a triple-layer structure and its thickness increases to 7 to 10 mm. After ovulation, the echogenicity of the endometrium begins to increase starting from the basal area, and in the luteal phase it has become hyperechogenic throughout with a thickness of 8 to 16 mm.

Follicle and Corpus Luteum

- Several 2 to 5 mm follicles may be seen in the ovaries with TVS. One or more of the follicles will grow during the early cycle.
- Around cycle days 9 to 10 the leading follicle can be identified; it has a diameter of about 10 mm. Thereafter it grows rapidly, and by ovulation it is 20 to 24 mm in diameter.
- After ovulation the follicle collapses, and as the corpus luteum develops, the content of the cyst may have a slightly heterogeneous consistency. The wall is sometimes seen as a rather thick formation with low-level echoes. Occasionally, corpus luteum forms a homogeneous hypoechogenic thin-walled structure. The diameter of a normal follicle or corpus luteum does not usually exceed 30 mm.

Monitoring of Infertility Treatment

- In infertility treatment, the growth of the follicle and the development of the endometrium can be monitored during hormone stimulation. With US the developing follicles can be counted, the dosage of hormone treatment adjusted, and the timing of interventions, such as insemination during ovulation, determined.
- US can be used to recognise ovarian hyperstimulation syndrome, which is a rare but serious complication of gonadotrophin stimulation used for infertility treatment. After stimulation and follicle puncture, the ovaries can be 60 to 70 mm in diameter and multicystic. In hyperstimulation syndrome, the ovaries are often over 80 mm in diameter, and in severe cases there is fluid in the peritoneal cavity.

Localization of an Intrauterine Device (IUD)

- US can be used to verify the presence and proper intrauterine localisation of an IUD.
- A copper IUD gives a strong echo and is easy to detect.
- The presence of a levonorgestrel IUD (Mirena®) might be more difficult to verify. Only the ends of the plastic arm of the device are detectable with US. Moreover, being a foreign body it produces dark extrauterine shadows which differ according to projections used.
- If an IUD is positioned correctly (i.e., high enough in the uterus), the difference between the upper portion of the IUD and the outer edge of the fundus should not exceed 20 mm in a normally sized uterus.
- It is usually impossible to detect an IUD that is located outside the uterus with an US.

Bleeding Disorders

Fertile Age

- The most common causes
    - Functional bleeding disorder of hormonal origin
        - Deviation from the normal structure of the endometrium in the different phases of the menstrual cycle described above is not sufficient for making a diagnosis.
        - Endometrial thickness of more than 18 mm suggests endometrial disease.
    - Endometrial polyp
        - An echodense, well-defined, round mass in the uterine cavity, which is best visualised during the proliferative phase. It may have a cystic structure.
        - The polyp can be imaged even better should any liquid be present in the uterine cavity, or if fluid is introduced with an insemination catheter. The blood vessel supplying the polyp may be visualised with colour Doppler.
    - Submucotic myoma
        - A submucotic myoma gives a low echo as compared with a polyp. It is usually possible to differentiate a submucotic myoma from a polyp.

Postmenopausal Bleeding Disorders

- Bleeding or bloody discharge in a postmenopausal woman should be considered as a sign of endometrial cancer until otherwise proven.
- An endometrium more than 10 mm in thickness in a postmenopausal patient strongly suggests endometrial cancer.
- Endometrial cancer is seen extremely rarely when the endometrium is less than 5 mm thick.
- US alone is not sufficient for making a diagnosis. A histological sample of the endometrium is always needed.

Sonohysterography

In sonohysterography 5 to 15 mL of saline solution is injected into the uterine cavity with, for example, an insemination catheter. The saline solution gives a contrast in the uterine cavity which allows the best visualisation of any polyps in the uterine corpus and submucotic myomas protruding into the cavity. A histological sample should be taken before performing sonohysterography.

Salpingosonography

Salpingosonography may be used as a primary investigation for infertility instead of laparoscopic chromopertubation. Agitated saline is injected into the uterine cavity with an insemination catheter. The air bubbles in the saline act as a contrast, and the fallopian tubes can be visualised. The procedure is markedly reliable compared with chromopertubation. The flow through the tubes can be confirmed as well as tubular patency.

Gynaecological Tumours

- Bimanual palpation is the basic examination, which sometimes reveals a tumour of the pelvic region. It may also be sufficient for differential diagnosis

of uterine myomas. Palpation may, however, be greatly hindered by the patient's obesity.

- US examination is indicated to verify diagnosis when
    - diagnosing a pelvic mass is otherwise difficult
    - an adnexal tumour is detected
    - the findings on examination are not clear and the patient has symptoms in the pelvic region and lower abdomen (swelling, pain, bleeding, bladder symptoms)
    - the patient has a family history of ovarian cancer

Myoma and Adenomyosis

- A myoma is often seen as a more hypoechogenic mass when compared with the normal myometrium. It has well defined margins, and a thin wall may be visible. Cyst formation can often be seen in rapidly growing or degenerating myomas.
- A pedunculated myoma or a multimyotic massively enlarged uterus may be difficult to differentiate from ovarian cancer even with US.
- The ring-like vascularisation on the outer border of a myoma may be visualised with colour Doppler. Vascularisation of the inner structures is scant. Profuse vascularisation may be suggestive of a malignant myoma (i.e., sarcoma).
- Adenomyosis, in which the benign cystic structures of the endometrium grow diffusely into the uterine wall, may be seen as focuses that resemble myoma, but are not clearly discernible from the muscular layer of the uterus.

Endometrial Cancer

- Cancer of the uterine corpus is always diagnosed from a histological sample.
- Endometrial cancer is often seen as non-homogenous thickening of the endometrium (14 to 15 mm)
- The depth of invasion can often be determined rather precisely with US.
- In most cases, cervical cancer cannot be diagnosed by US.

Ovarian Cysts

- Functional cysts are mostly detected as incidental findings in US, sometimes also when US is performed because of diffuse pelvic pains or suspicious findings on bimanual examination.
- Functional cysts have typically thin and smooth walls without internal echoes.
- A haemorrhagic cyst or a corpus luteum cyst may have variable internal structures, which disappear during follow-up.
- Functional cysts are usually less than 60 mm in diameter.
- Even postmenopausal women may have benign ovarian cysts, which are less than 50 mm in diameter and may disappear during follow-up.
- Verifying the disappearance of a functional cyst by a follow-up examination after 3 to 4 months is indicated. If the cyst grows, its removal is indicated. (See Finnish Medical Society Duodecim guideline "Gynaecological tumours").
- Patients with a levonorgestrel IUD (Mirena®) may have a higher than normal incidence of ovarian cysts, which usually disappear without surgical intervention.

US Diagnosis of Ovarian Tumours

- It is not always possible to differentiate between a benign and a malignant ovarian tumour by US.
- An ovarian cyst less than 60 mm in diameter with no internal echoes and a smooth internal surface is extremely seldom malignant.
- A malignant tumour may
    - have a tumour wall of over 3 mm in thickness or tumour septa
    - have papillary growth inside the inner walls
    - be multilocular
    - have a complex structure of solid and cystic components (the probability of cancer is then over 60%)
    - have poorly organised and profuse vasculature
    - be accompanied with ascites
- Particular types of an ovarian tumour include
    - mucinous tumours with a "snowstorm" echo pattern
    - endometriomas, which are thin-walled cysts with homogenous granular inner material, but their presentation may also be atypical
    - dermoid tumours often contain fine granular sebaceous material, which may consist of the more solid bone or cartilage components, which can cause acoustic shadowing. Hypoechogenic cysts may also occur.

Pelvic Infection

- An acute pelvic inflammatory disease may cause a tubo-ovarian abscess. This is seen in US examination as a multilocular, thick-walled mass that contains echo-dense fluid collections. Strong vascularity is detectable in the walls of the inflammatory mass. Ca-125 may be increased.
- When the infection subsides, the infectious complex may disappear or it may turn into a sactosalpinx, which is an elongated multilocular mass causing a torsion of the fallopian tube. The torsion is easily identifiable from different projections, and the ovary will be seen as a separate structure. Small pseudopapillae (1 to 2 mm) may be seen in the walls. Incomplete septa do not reach from wall to wall inside the mass. No vasculature is detectable.
- Actinomyces may cause inflammatory foci that resemble a tumour.
- Periappendicular abscess may sometimes be mistaken for a tumour around the right ovary.

Differential Diagnosis

- Dilated bowel loops may sometimes simulate a cystic adnexal mass in a patient with abdominal pains that are connected to a bowel motility disturbance. However, the movement of the bowel contents and peristalsis will confirm the nature of the finding.
- Venous plexuses near the uterus, associated with pelvic vein varices, may sometimes be very large and resemble a cystic ovarian tumour. If differential diagnosis is difficult, a colour Doppler investigation will yield a typical image of venous circulation.
- Sometimes multiple nabothian cysts in the uterine cervix may be mistaken as a cystic ovarian tumour.

Definitions:

Levels of Evidence

A. Strong research-based evidence. Multiple relevant, high-quality scientific studies with homogenic results.
B. Moderate research-based evidence. At least one relevant, high-quality study or multiple adequate studies.
C. Limited research-based evidence. At least one adequate scientific study.
D. No research-based evidence. Expert panel evaluation of other information.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

REFERENCES SUPPORTING THE RECOMMENDATIONS

References open in a new window

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

Concise summaries of scientific evidence attached to the individual guidelines are the unique feature of the Evidence-Based Medicine Guidelines. The evidence summaries allow the clinician to judge how well-founded the treatment recommendations are. The type of supporting evidence is identified and graded for select recommendations (see the "Major Recommendations" field).

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Endovaginal ultrasound has a high sensitivity for detecting endometrial cancer and other endometrial disease and can reliably identify postmenopausal women with vaginal bleeding who are unlikely to have significant endometrial disease so that endometrial sampling may be unnecessary.

Subgroups Most Likely to Benefit

Postmenopausal women with vaginal bleeding who are unlikely to have significant endometrial disease

POTENTIAL HARMS

Not stated

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

Ultrasound alone is not sufficient for making a diagnosis of endometrial cancer. A histological sample of the endometrium is always needed.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better

IOM DOMAIN

Effectiveness

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Finnish Medical Society Duodecim. Gynaecological ultrasound examination. In: EBM Guidelines. Evidence-Based Medicine [Internet]. Helsinki, Finland: Wiley Interscience. John Wiley & Sons; 2005 May 4 [Various].

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2001 Jan 5 (revised 2005 May 4)

GUIDELINE DEVELOPER(S)

Finnish Medical Society Duodecim - Professional Association

GUIDELINE DEVELOPER COMMENT

Not stated

SOURCE(S) OF FUNDING

Finnish Medical Society Duodecim

GUIDELINE COMMITTEE

Editorial Team of EBM Guidelines

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Primary Author: Pertti Palo

FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

This guideline updates a previous version: Palo P. Gynaecological ultrasound examination. In: EBM Guidelines. Evidence-Based Medicine [CD-ROM]. Helsinki, Finland: Duodecim Medical Publications Ltd.; 2004 Apr 14 [Various].

GUIDELINE AVAILABILITY

This guideline is included in "EBM Guidelines. Evidence-Based Medicine" available from Duodecim Medical Publications, Ltd, PO Box 713, 00101 Helsinki, Finland; e-mail: info@ebm-guidelines.com; Web site: www.ebm-guidelines.com.

AVAILABILITY OF COMPANION DOCUMENTS

None available

PATIENT RESOURCES

None available

NGC STATUS

This summary was completed by ECRI on August 28, 2001. The information was verified by the guideline developer as of October 26, 2001. This summary was updated on December 29, 2003, July 15, 2004, and November 11, 2005.

COPYRIGHT STATEMENT

This NGC summary is based on the original guideline, which is subject to the guideline developer's copyright restrictions.

DISCLAIMER

NGC DISCLAIMER

The National Guideline Clearinghouse™ (NGC) does not develop, produce, approve, or endorse the guidelines represented on this site.

All guidelines summarized by NGC and hosted on our site are produced under the auspices of medical specialty societies, relevant professional associations, public or private organizations, other government agencies, health care organizations or plans, and similar entities.

Guidelines represented on the NGC Web site are submitted by guideline developers, and are screened solely to determine that they meet the NGC Inclusion Criteria which may be found at http://www.guideline.gov/about/inclusion.aspx .

NGC, AHRQ, and its contractor ECRI Institute make no warranties concerning the content or clinical efficacy or effectiveness of the clinical practice guidelines and related materials represented on this site. Moreover, the views and opinions of developers or authors of guidelines represented on this site do not necessarily state or reflect those of NGC, AHRQ, or its contractor ECRI Institute, and inclusion or hosting of guidelines in NGC may not be used for advertising or commercial endorsement purposes.

Readers with questions regarding guideline content are directed to contact the guideline developer.

© 1998-2008 National Guideline Clearinghouse

Date Modified: 10/6/2008