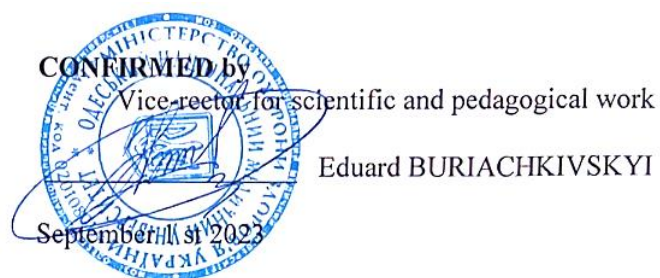


**MINISTRY OF HEALTH OF UKRAINE
ODESSA NATIONAL MEDICAL UNIVERSITY**

Faculty international

Department of Obstetrics and Gynecology



**METHODICAL RECCOMENDATIONS FOR A PRACTICAL LESSON
FROM MEDICAL PRACTICE**

Faculty international, 4th course

Academic discipline "**Obstetrics and Gynecology**"

Practical lesson № 3. Topic: "Emergency care for abnormal uterine bleeding (AUB)."

Approved:

Meeting of the Department of Obstetrics and Gynecology
Odessa National Medical University

Protocol No1 of August 28, 2023

Head of the Department



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Practical lesson №3.

Topic: "Emergency care for abnormal uterine bleeding (AUB). Classification. Examination of patients with AUB. Provision of urgent medical care at AUB".

Objective: To acquire practical skills in providing emergency care for abnormal uterine bleeding. Based on the data of etiopathogenesis and classification of disorders of the reproductive system, master and improve the skills of collecting anamnesis, examination in mirrors, bimanual examination.

Based on the data obtained, determine the patient's examination plan, be able to make a preliminary diagnosis. Be able to evaluate the results of clinical and laboratory examination of the patient. Drawing up an algorithm for providing emergency care at AUB.

Basic concepts: Abnormal uterine bleeding. Etiopathogenesis and classification of AUB. What examination is necessary for a patient with AUB. Evaluation of the results of clinical and laboratory examination. Algorithm for providing emergency care in AUB.

Equipment: Professional algorithms, structural and logical diagrams, tables, models, video materials, results of laboratory and instrumental studies, situational tasks, patients, case histories.

1. Organizational activities (greetings, checking the attendees, announcing the topic, the purpose of the lesson, motivating higher education students to study the topic).

The functioning of the female reproductive system is due to the complex interaction of neuroendocrine regulation. Disorders of the reproductive system can affect one or another level of neuroendocrine regulation. Among the disorders of the female reproductive system, a significant place belongs to the development of abnormal uterine bleeding.

Abnormal uterine bleeding leads to a decrease in the reproductive function of women, infertility, anemia, and the development of severe complications.

In this regard, the development of optimal methods of diagnosis and emergency care for abnormal uterine bleeding remains one of the most important problems of modern gynecology, which is not only of medical but also social importance.

2. Control of the reference level of knowledge (written work, written testing, online testing, frontal survey, etc.).

Knowledge requirements:

- Based on the data of complaints, anamnesis, clinical course of the disease, establish a preliminary diagnosis;
- Carry out differential diagnosis and determine the clinical diagnosis of the disease;
- Determine the list of necessary clinical, laboratory and instrumental studies;
- Evaluate the data of clinical, laboratory and instrumental examination of the patient;
- Prescribe pathogenetic treatment.

List of didactic units:

- Classification of abnormal uterine bleeding (AUB);
- Acute AUB;
- Chronic AUB;
- Diagnostic criteria for abnormal uterine bleeding;
- Algorithm for examining a patient with abnormal uterine bleeding;
- Algorithm for emergency care in case of AUB;
- Prevention of abnormal uterine bleeding.

Theoretical questions for the class

- Abnormal uterine bleeding (AUB), definition.
- Etiological and pathogenetic factors in disorders of the reproductive system.
- Classification of abnormal uterine bleeding.
- Plan of examination of a patient with AUB.
- Drawing up an algorithm for providing emergency care for AUB.
- Drug treatment of AUB.
- Indications for surgical treatment of AUB.

Typical test tasks

1. The following methods are used for surgical treatment of abnormal uterine bleeding:

- A. Colposcopy
- B. Culdocentesis
- C. Laparoscopy
- D. Fractional diagnostic curettage*.
- E. Hysterosalpingography

2. A 47-year-old woman was delivered to the gynecological department with complaints of moderate bloody discharge from the genital tract after a delay in menstruation for 2 weeks. The menstrual cycle is regular, without features. Which of the following methods is the most informative?

- A. Laparoscopy
- B. Colposcopy
- C. Hysteroscopy and curettage of the uterus*.
- D. Hysterosalpingography

Typical situational tasks

1. A 28-year-old female patient was admitted to the gynecological department with complaints of acute left lower abdominal pain, nausea, vomiting. Bimanual examination: the body of the uterus was of normal size, its displacement was painful, the left ovary was slightly enlarged, rounded, painful. The vaginal vault is deep, palpation on the left is painful. In the mirrors: the cervix and vaginal mucosa are unchanged. Which of the examination methods is the most informative?

Standard answer: Laparoscopy.

2. A 32-year-old patient complains of a 14-day delay in the next menstrual period. Menstruation since the age of 12, 3-4 days, cycle 28-30 days Sexual life is regular, not protected from pregnancy. On examination: satisfactory condition, soft, painless abdomen, blood pressure 115/75 mm Hg, pulse 74 per 1 min. Transvaginal echography diagnosed a tubal pregnancy. Tactics of the doctor of the antenatal clinic?

Standard answer: Urgently hospitalize the patient in the gynecological department to clarify the diagnosis and decide on the tactics of treatment.

3. Formation of professional skills (mastering skills, supervision, determining treatment regimens, conducting laboratory tests, etc:)

- Content of tasks (tasks, clinical situations, etc.)

Atypical test tasks:

1. A 20-year-old female patient consulted a gynecologist with complaints of absence of menstruation for 7 months. From the anamnesis: at an early age suffered from childhood infections and sore throats, menarche since the age of 12, regular periods, menstrual cycle - 28 days, menstruation lasts 5-6 days, painless. 7 months ago she suffered stress. During the gynecological examination, no changes in the uterus and appendages were not detected.

What is the most likely diagnosis?

- A. Secondary amenorrhea. *
- B. Primary amenorrhea.
- C. Algodysmenorrhea.
- D. Oligomenorrhea.
- E. False amenorrhea.

2. A 36-year-old woman came to the gynecological hospital with complaints of on significant bleeding from the genital tract and delayed menstruation for 1 month. Bimanual examination: cervix barrel-shaped, soft consistency. The uterus is of normal size, slightly softened. Appendages without features on both sides. In mirror examination: cervix is cyanotic, enlarged in size, the external os is dilated to 0.5 cm. Urine test for hCG is positive.

What is the most likely diagnosis?

- A. Cervical pregnancy. *
- B. Uterine pregnancy.
- C. Abortion on the move.
- D. Threatened abortion.
- E. Ectopic pregnancy.

Atypical situational tasks:

1. A 48-year-old woman with abnormal uterine bleeding after a 10-day delay in menstruation was admitted to the gynecology department. The menstrual cycle is regular, without features. Which of the research methods is the most informative?

Standard answer: Hysteroscopy and uterine curettage.

2. A 26-year-old patient complains of a 12-day delay in the next menstrual period. Menstruation since the age of 15, 5-6 days, 29-30 days later. Sexual life since the age of 18, regular. On examination: general condition satisfactory, abdomen soft, painless, blood pressure 110/70 mm Hg, pulse 70 per 1 min. During transvaginal echography, there is a suspicion of a progressive tubal pregnancy. What is the doctor's tactic?

Standard answer: Surgical treatment. Diagnostic laparoscopy.

Recommendations (instructions) for performing tasks (professional algorithms, orientation maps for the formation of practical skills)

Unified clinical protocol for the staged provision of medical care for abnormal uterine bleeding (AUB) - Order of the Ministry of Health of Ukraine of 13.04.16 No. 353 (as amended on 23.09.16 No. 994).

Abnormal uterine bleeding (AUB) is any abnormality of the menstrual cycle, including changes in the regularity and frequency of menstruation, the duration of bleeding, or the amount of blood lost.

- **Acute** AUB are bleeding episodes in non-pregnant women of reproductive age, the intensity of which requires immediate intervention to prevent further blood loss.
- **Chronic** AUB is bleeding with abnormal duration, volume, and/or frequency that has occurred for most of the last 6 months.
- **Heavy menstrual bleeding (HMB)** is excessive menstrual blood loss that negatively affects a woman's physical condition, social, emotional and/or material aspects of her life.

Classification (PALM\COEIN)

to determine the causes of AUB not related to pregnancy

STRUCTURAL

NON-STRUCTURAL

P olyp
A denomyosis
L eiomyoma
M alignancy & hyperplasia

S ubmucosal
O ther

C oagulopathy
O vulatory dysfunction
E ndometrial
I atrogenic
N ot yet classified



NORMAL LIMITS FOR THE MENSTRUAL CYCLE (FIGO, 2011)

Parameter	Normal	Abnormal	<input checked="" type="checkbox"/>
Frequency	Absent (no bleeding) = amenorrhea		<input type="checkbox"/>
	Infrequent (>38 days)		<input type="checkbox"/>
	Normal (≥24 to ≤38 days)		<input type="checkbox"/>
	Frequent (<24 days)		<input type="checkbox"/>
Duration	Normal (≤8 days)		<input type="checkbox"/>
	Prolonged (>8 days)		<input type="checkbox"/>
Regularity	Normal or "Regular" (shortest to longest cycle variation: ≤7-9 days)*		<input type="checkbox"/>
	Irregular (shortest to longest cycle variation: ≥8-10 days)*		<input type="checkbox"/>
Flow Volume (patient determined)	Light		<input type="checkbox"/>
	Normal		<input type="checkbox"/>
	Heavy		<input type="checkbox"/>

Intermenstrual Bleeding (IMB) Bleeding between cyclically regular onset of menses	None		<input type="checkbox"/>	
	Random		<input type="checkbox"/>	
	Cyclic (Predictable)	Early Cycle		<input type="checkbox"/>
		Mid Cycle		<input type="checkbox"/>
		Late Cycle		<input type="checkbox"/>

Unscheduled Bleeding on Progestin ± Estrogen Gonadal Steroids (birth control pills, rings, patches or injections)	Not Applicable (not on gonadal steroid medication)		<input type="checkbox"/>
	None (on gonadal steroid medication)		<input type="checkbox"/>
	Present		<input type="checkbox"/>

Algorithm of examination of a patient with AMC:

1. Collection of anamnesis.
2. Physical examination.
3. Laboratory methods of examination:
 - Papanicolaou smear according to indications; in case of suspicion of sexually transmitted infections.
 - Complete blood count (anemia screening), with normal hemoglobin content - determination of ferritin level (iron depot status);
 - Determination of human chorionic gonadotropin (β -subunit) in serum or urine, rapid pregnancy test;
 - determination of the level of hormones: thyroid-stimulating hormone (TSH), free thyroxine (T₄ free), prolactin (detection of subclinical hypothyroidism and hyperprolactinemia);
 - in case of a history of severe bleeding, starting with menarche; other types of bleeding or signs of coagulation disorders in the family history - a coagulogram and consultation with a hematologist.
4. Instrumental methods:
 - transvaginal (transrectal) ultrasound or saline infusion sonohysterography;
 - Blind aspiration biopsy with histological examination of the obtained material;
 - diagnostic hysteroscopy with targeted biopsy.
5. Differential diagnosis according to the classification of AUB according to PALM-COEIN.

Differential diagnosis.

When determining the diagnosis of AUB, it is necessary to exclude the presence of structural pathologies, as well as bleeding associated with pregnancy. In adolescence, the cause of abnormal uterine bleeding is mainly ovulation disorders associated with immature hypothalamic-pituitary-ovarian regulation. Particular attention in patients of this category should be paid to the exclusion of AUB caused by somatic pathology (coagulopathy and others) and bleeding due to arteriovenous malformations of the uterus.

Emergency care at AUB.

Acute AUB.

In the case of acute AUB, if vital functions are impaired, their parameters (blood pressure, heart rate, respiratory rate, temperature) are stabilized and hypovolemia is eliminated. Drug treatment is the therapy of choice for most patients (if clinical circumstances allow). The method of treatment is chosen taking into account the severity of the condition, anamnesis, concomitant pathology and the presence of contraindications.

One of the following medications can be used to treat acute AMC: tranexamic acid, combined oral contraceptive, oral progestogens (Table 1). When using hemostasis with combined oral contraceptives, the risk of thromboembolic complications is taken into account.

Table 1

Drug	One dose	Mode
Combined oral contraceptive	Monophasic (30-35 mcg ethinylestradiol)	3 times a day for 7 days or up to 4-5 times a day for 3-5 days, then decrease every 2 days by 1 tablet. The total period of use of COC is at least 20 days.
Tranexamic acid	1.5 g orally or 10 mg/kg intravenously (maximum up to 600 mg)	3 times a day for 5 days, every 8 hours.
Linestrenol	5 mg orally	3 times a day for 7 days.

Surgical methods for the treatment of acute AUB, depending on the clinical situation and technical capabilities, include endometrial ablation/resection, uterine artery embolization, hysterectomy, and specific surgical treatment in case of structural pathology.

Dilatation and curettage are not the method of choice, except in cases of severe conditions caused by acute AUB that cannot be controlled by medical therapy and there is no possibility of other surgical interventions.

Chronic AUB.

If the cause of uterine bleeding is a systemic disease, it should be treated by a specialized specialist.

If structural pathology of the pelvic organs is detected, treatment should be carried out in accordance with the relevant clinical protocols.

After excluding structural pelvic pathology, medical treatment should be considered as the first line of therapy for AUB.

Treatment objectives:

1. Reduction of blood loss during menstruation.
2. Prevention of relapses.
3. Correction of anemia.
4. Improving the quality of life.

The medical treatment of iron deficiency anemia is carried out with oral forms of iron preparations (tablets, liquid forms). In the case of acute AUB, intravenous iron preparations may be used. The effectiveness of drug treatment is evidenced by an increase in hemoglobin levels by 20 g/L after 21 days from the start of drug treatment. If the response to treatment is positive, treatment continues. A complete blood count is performed monthly. Treatment is continued for 3 months after hemoglobin and ferritin levels are normalized (protocol for the management of patients with iron deficiency anemia).

Medication treatment of AUB

Before prescribing treatment, a woman's reproductive plans and the need for hormonal contraception are determined. Ethamsylate is not used for the medical treatment of abnormal uterine bleeding.

Hormonal methods of treatment of AUB

If there are no contraindications and the woman approves this method of treatment, the following hormonal medications are prescribed: intrauterine system with a progestogen or a combination of estradiol valerate and dienogest in a dynamic dosing regimen; combined oral contraceptives; oral gestagens or long-acting progestogen injections.

- *Intrauterine system with progestin.*

The intrauterine system with levonorgestrel (LNG-IUD), in the absence of significant structural pathology, significantly reduces menstrual blood loss and helps to increase hemoglobin and ferritin levels.

- *Combined oral contraceptives.*

The only combination of estrogen and progestin indicated for the treatment of AUB is estradiol valerate + dienogest in a dynamic dosing regimen. Combined oral contraceptives containing ethinylestradiol can be used in the treatment of chronic abnormal uterine bleeding in both cyclic and mainly continuous regimens, taking into account thrombotic risks.

- *Oral progestins.*

The use of progestins in the regimen from the 5th to the 25th day of the menstrual cycle (at least 20 days in the cycle) is accompanied by a reduction in menstrual blood loss. The use of progestins only in the luteal phase of the cycle is not an effective treatment for abnormal uterine bleeding.

- *Gonadotropin-releasing hormone agonists.*

Prescription of gonadotropin-releasing hormone agonists is considered when all other treatments are contraindicated or associated with a high risk of complications, or the patient refuses to use them.

Non-hormonal treatments

If abnormal uterine bleeding is accompanied by dysmenorrhea, nonsteroidal anti-inflammatory drugs (NSAIDs) are preferred over tranexamic acid.

Nonsteroidal anti-inflammatory drugs inhibit prostaglandin synthesis by changing the ratio between prostaglandins and thromboxane, which contributes to vasoconstriction in the uterus. As a matter of routine, NSAID therapy should be started the day before menstruation and continued until bleeding stops (3-5 days). There are no significant differences in efficacy between different NSAIDs.

Fibrinolysis inhibitors.

In women with abnormal uterine bleeding, the endometrium has an increased level of plasminogen activators with more pronounced local fibrinolytic activity. Tranexamic acid (a plasminogen activator inhibitor) is an antifibrinolytic that binds reversibly to plasminogen, reducing local fibrin breakdown without changing blood clotting parameters.

The use of non-steroidal anti-inflammatory drugs and/or tranexamic acid is discontinued if there is no positive dynamics of bleeding reduction within three menstrual cycles.

Indicators of ineffective drug therapy:

- In acute AUB - no dynamics of blood loss reduction within 12 hours after the initiation of therapy with the development of hemodynamic and/or hematologic complications;

- In chronic AUB - no dynamics of blood loss reduction within 3 months after the initiation of therapy.

Surgical methods of treatment of A AUB.

Indications for surgical treatment of women with AUB: -- ineffectiveness of medical therapy,

- inability to use medical therapy (adverse reactions, contraindications, etc.)

- structural pathology of the uterus.

Surgical methods:

- hysteroscopic ablation/resection with mandatory histological examination of the endometrium;
- dilatation and curettage (scraping of the uterine cavity) with a mandatory histological examination of the endometrium;
- endometrial ablation;
- embolization of the uterine arteries;
- hysterectomy;
- surgical methods of treating structural pathology of the uterus.

The ideal approach to therapy is to select treatment methods ranging from less invasive to more invasive.

Requirements for the results of work, including for registration

- Collect a special gynecological history.
- Perform gynecological examination (examination in mirrors, bimanual, rectal).
- To take material from the urethra, cervical canal and vagina for bacterioscopic and cytomorphological examination.
- Make a plan for the examination of a patient with AMUB
- Evaluate the results of the patient's examination, make a preliminary diagnosis.
- Develop an algorithm for providing emergency care for abnormal uterine bleeding.
- Use of multimedia presentation on the topic of the lesson (literature review using modern sources; videos, etc.).
- Control materials for the final stage of the class: tasks, assignments, tests, etc.

4. Test tasks for self-control.

Test tasks KROK-2:

1. A 12-year-old girl has been experiencing bleeding from the genital tract for the past 2 weeks, after delayed menstruation for 3 months, weakness, headache, dizziness. She has been menstruating since the age of 10. Objectively: pale skin, tachycardia, blood pressure - 100/60 mm Hg: Hb - 100 g/l, platelets 200×10^9 G/l. Gynecological examination: virgo. Rectal examination: the uterus and appendages are without pathology.

What is the most likely diagnosis?

- A. Abnormal uterine bleeding of the juvenile period.
- B. Aborted pregnancy.
- C. Werlhoff's disease.
- D. Sclerosing ovarian syndrome.
- E. Hemorrhagic diathesis.

2. A 34-year-old patient came to the antenatal clinic with complaints of moderate blood discharge from the genital tract, which appeared after a delay of the next

menstruation for 1 month. During the gynecological examination: the cervix is epithelialized, the uterine body is not enlarged, dense, mobile, painless, the uterine appendages on both sides are not enlarged, painless, and the vaults are deep.

What is the preliminary diagnosis?

- A. Abnormal uterine bleeding.
- B. Internal endometriosis.
- C. Ectopic pregnancy.
- D. Submucosal uterine fibroids.

Correct answers: 1A, 2A.

Tasks:

1. The teacher conducts a survey on the control questions on the topic of the lesson.
2. The teacher distributes a list of medical manipulations in gynecology among higher education students:

- Perform a gynecological examination (examination in mirrors and bimanual)
- Take material for bacterioscope5.

Summarizing the results

Current control: oral questioning, assessment of practical skills, assessment of communication skills during a role-playing game, solving situational clinical problems, assessment of activity in the classroom. Final control: differential credit.

Assessment of current learning activities in the practical class:

1. Assessment of theoretical knowledge on the topic of the lesson:
- methods: survey, solving a situational clinical problem
maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.
 2. Assessment of practical skills and manipulations on the topic of the class:
Methods for assessing the correctness of practical skills:
maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.
 3. Assessment of work with patients on the topic of the class:
Evaluation methods: a) communication skills of communication with the patient, b) correctness of appointment and evaluation of laboratory and instrumental studies, c) compliance with the algorithm of differential diagnosis, d) justification of the clinical diagnosis, e) preparation of a treatment plan;
maximum grade - 5, minimum grade - 3, unsatisfactory grade - 2.
- The grade for one practical lesson is the arithmetic mean of all components and can only have an integer value (5, 4, 3, 2), which is rounded by the statistical method.

Criteria for the current assessment in a practical lesson:

Score	Evaluation criteria
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«5»	The applicant is fluent in the material, takes an active part in the discussion and solution of a situational clinical problem, confidently demonstrates knowledge of ultrasound screening diagnostics in obstetrics and the correct appointment of laboratory and instrumental studies, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
«4»	The applicant is well versed in the material, participates in the discussion and solution of a situational clinical problem, demonstrates knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies with some errors, expresses his opinion on the topic of the lesson, demonstrates clinical thinking.
«3»	The applicant does not have enough knowledge of the material, uncertainly participates in the discussion and solution of a situational clinical problem, demonstrates knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies with significant errors.
«2»	The applicant does not own the material, does not participate in the discussion and solution of a situational clinical problem, does not demonstrate knowledge of ultrasound screening diagnostics and the correct appointment of laboratory and instrumental studies.

The objective of the practice is to consolidate the knowledge and skills gained in the study of basic clinical and theoretical disciplines (examination of patients, clinical diagnosis, prescription of treatment, prevention, and medical examination) and further improvement of practical skills, familiarization with the organization of medical care and working conditions of obstetrician-gynecologist, as well as strengthening of skills in sanitary and educational work.

Applicants who have completed the internship program are admitted to the OSPI and include

- defense of the history of a gynecological patient,
- demonstration of medical manipulations in gynecology (according to the list 5) on phantoms.

List of recommended literature.

Main:

1. Obstetrics and Gynecology: in 2 books. - Book 2. Gynecology: textbook (university III-IV r.a.) / ed. V.I. Gryshchenko, M.O. Shcherbyna - 3rd ed., vypr., 2020. – 376 s
2. Clinical Obstetrics and Gynecology: 4th Edition/ Brian A. Magovan, Philip Owen, Andrew Thomson. – 2021. – 454 p.

3. National approaches to the implementation of the system of regionalization of perinatal care in Ukraine (practical guidelines) // Digest of professional medical information. — 2012. — № 48—49. — pp. 1–59.
4. Oxford Handbook of Obstetrics and Gynaecology by S. Collins , S. Arulkumaran , K. Hayes , S. Jackson , L. Impey, Oxford University Press, 3rd Edition, 2013
5. Handbook of Gynecology Shoupe, MD, MBA, Donna (Ed.), Springer, 2017
6. Oxford Handbook of Obstetrics and Gynaecology by S. Collins , S. Arulkumaran , K. Hayes, S. Jackson , L. Impey, Oxford University Press, 3rd Edition, 2013

Additional:

1. Progress in Obstetrics and Gynaecology. Vol 10. Ed J Studd. (Pounds sterling 26.50.) Churchill Livingstone, 1993. ISBN 0443-04754-5.
2. Kouides PA, Conard J, Peyvandi F, Lukes A, Kadir R. Hemostasis and menstruation: appropriate investigation for underlying disorders of hemostasis in women with excessive menstrual bleeding. Fertil Steril 2005;84(5):1345–51.
3. NCG. Heavy menstrual bleeding. United Kingdom: National Institute for Health and Clinical Excellence; 2007.
4. Hale GE, Manconi F, Luscombe G, Fraser IS. Quantitative measurements of menstrual blood loss in ovulatory and anovulatory cycles in middle- and late-reproductive age.

Electronic information resources:

1. <https://www.cochrane.org/> - Cochrane
2. <https://www.acog.org/> - The American College of Obstetricians and Gynecologists
3. <https://www.uptodate.com> – UpToDate
4. <https://online.lexi.com/> - Wulters Kluwer Health
5. <https://www.ncbi.nlm.nih.gov/> - National Center for Biotechnology Information
6. <https://pubmed.ncbi.nlm.nih.gov/> - National Library of Medicine
7. <https://www.thelancet.com/> - The Lancet
8. <https://www.rcog.org.uk/> - Royal College of Obstetricians & Gynaecologists
9. <https://www.npwh.org/> - Nurse practitioners in womens health
10. <http://moz.gov.ua>- Ministry of Health of Ukraine
11. www.ama-assn.org – [American Medical Association](http://www.ama-assn.org)
12. www.who.int – World Health Organization
13. www.dec.gov.ua/mtd/home/ - State Expert Center of the Ministry of Health of Ukraine <http://bma.org.uk>– British Medical Association
14. www.gmc-uk.org- General Medical Council (GMC)
15. www.bundesaerztekammer.de – German Medical Association
16. www.euro.who.int - World Health Organization Regional Office for Europe