^ Methods of functional diagnostics

- The properties of the cervical mucus changes because of the actions of estrogen and progesterone during the menstrual cycle . Max secreted during ovulation , the minimum allocated before menstruation .

The mucus tension symptom.

- In case, when you place some mucus from cervical canal between forceps legs and carefully move them apart, then you'll get a mucus string, the length of which depends on the mucus viscosity. Maximum length of the string will be in ovulation period when mucus viscosity is maximal. String's length is measured in centimeters (the greater estrogen production the longer is the string) and is estimated for 3-point system: 1 point (+) at string length up to 6 cm (early follicular phase), 2 point (++) — 8-10 cm (medium follicular phase, moderate estrogen saturation), and 3 point **(+++)** when string length is 15 cm and more (maximum estrogen saturation). Tension symptom diminishes and then disappears in luteal phase of menstrual cycle.

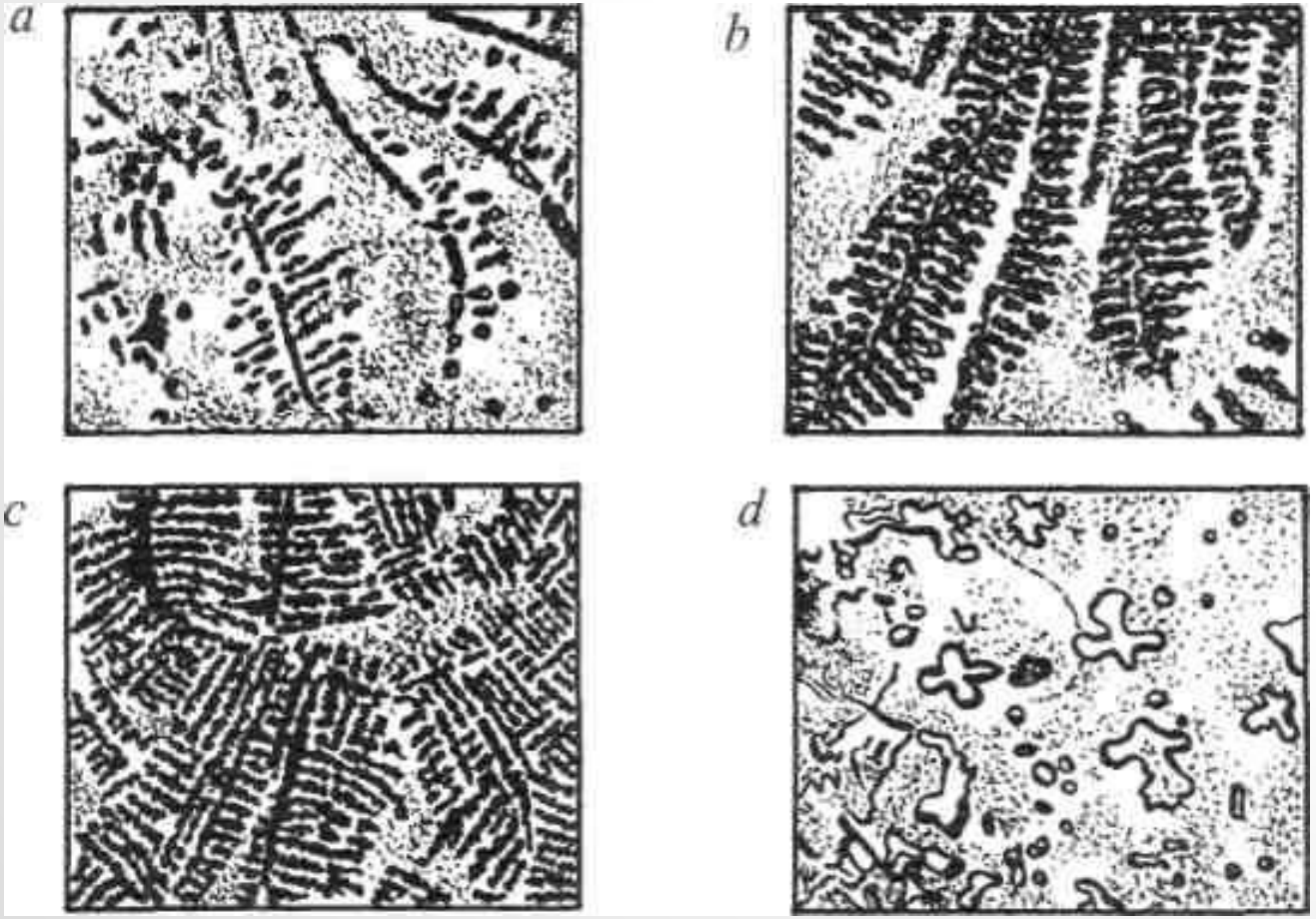
^ The "pupil symptom".

- Cervical tone and its external os diameter are changing during menstrual cycle under the influence of estrogen hormones. Dilatation of external cervical os and mucus appearance in it starts from the 8-9th cycle day and up to the 14th day it is maximally dilated (up to 3-6 mm in dia meter). Mucus drop, that comes forward from external os seems to be dark and looks like a pupil at illumination on the background of pink cervix. This is a positive "pupil" symptom. Amount of mucus begins to decrease during the next days and up to 18th-20th day of the cycle this symptom disappears and cervix becomes "dry". Such changes are typical for normal menstrual cycle. In case of follicle persistence, the "pupil" symptom does not disappear up to the time when bleeding occurs. This indicates on hyperestrogenemia and absence of luteal phase in ovaries. The "pupil" symptom is slightly positive or absent at amenorrhea. This symptom is also absent during pregnancy. The "pupil" symptom is estimated on the 3-point system: presence of small dark dot means 1 point (+), early follicular phase; 2,0-2,5 mm — 2 points (++), medium follicle phase; and 3,5 mm — 3 points (+++), ovulation. If cervix is strained by postnatal ruptures, erosion or endocervicitis test is unreliable.

The "fern symptom".

- The "fern test" is used to distinguish the ovaries functional state. It is named from the pattern of absorbtion that occurs when discharge is placed on a slide and is allowed to be dried in the room air. Arborisation intensity depends on the menstrual cycle phase i.e. on the ovarian estrogenic effect. Mucus is taken by forceps, which are inserted into cervical canal to depth of 5 mm. Then it is drifted on a glass slide, dried up and examined under the microscope. Such varieties of "ferm symptom" are distinguished *(fig. 28 a-d)* as:

The «fern symptom»



- 1)separated leaves of the fern plant (when the quantity of estrogen secretion is the minimal) — 1 point (+), early follicular phase;
- 2)expressed leaves of the fern plant — 2 points (++), medium follicle phase with moderate estrogen secretion;
- 3)thick stems and leaves deviate at angle of 90° (in the period of ovulation, when more estrogens are present) — 3 points (+++);
- 4)negative symptom.

- This test like the previous one is used for ovulation determination. Presence of "fern symptom" during the whole menstrual cycle indicates on high estrogen saturation (persistation of the follicle) and absence of the luteal phase; absence of this symptom can testify about estrogen insufficiency. Diagnostic value of all the described above tests is considerably increased in their complex using.

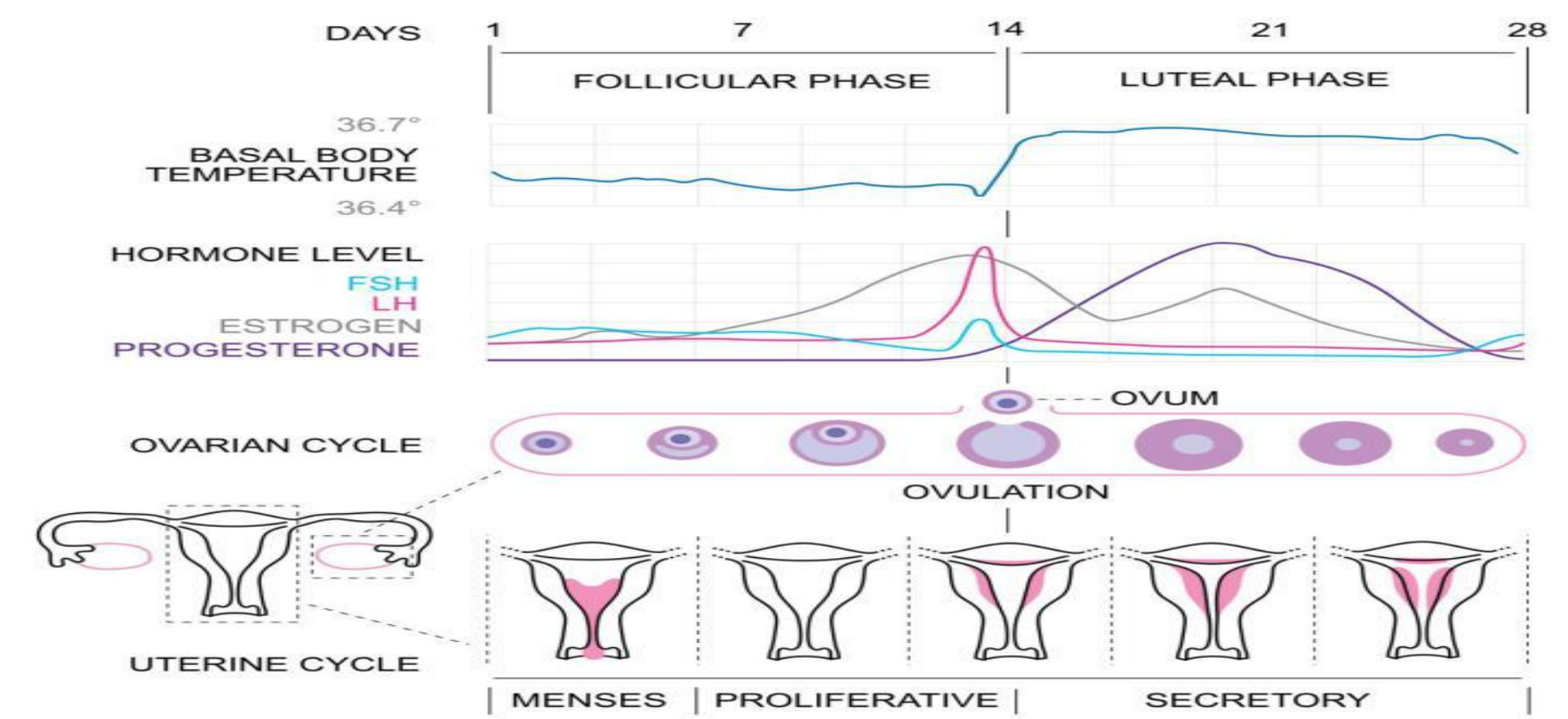
Test name	**^ Points quantity**			
	0	1	2	3
Amount of mucus	Absent	Slight	Moderate	Considerable
Mucus tension	Absent	Up to 6 cm	8-10 cm	15 cm
"Pupil symptom"	Absent	Dark dot	2,0-2,5 mm	3,5 mm
"Fern symptom"	Absent	Small crystals and seperate stems	Expressed leaf pattern	Big leaves with thick stem

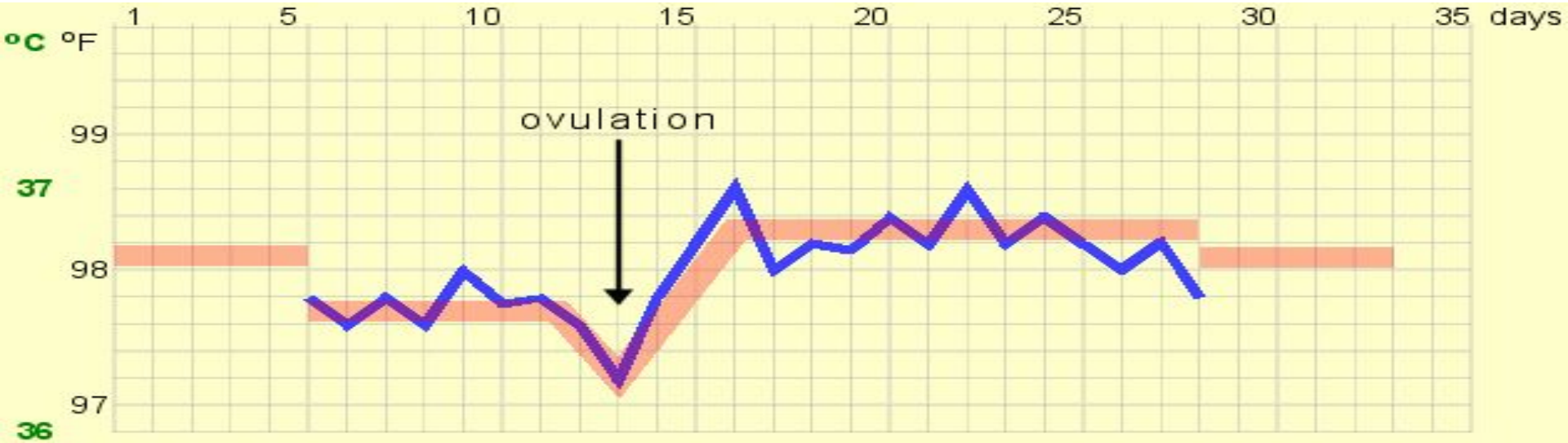
- Cervix index or cervical number (maximum value of each point is — 3, minimum — 0 (table 1) should be determined after the summarizing of the amount of all the points received from each test.

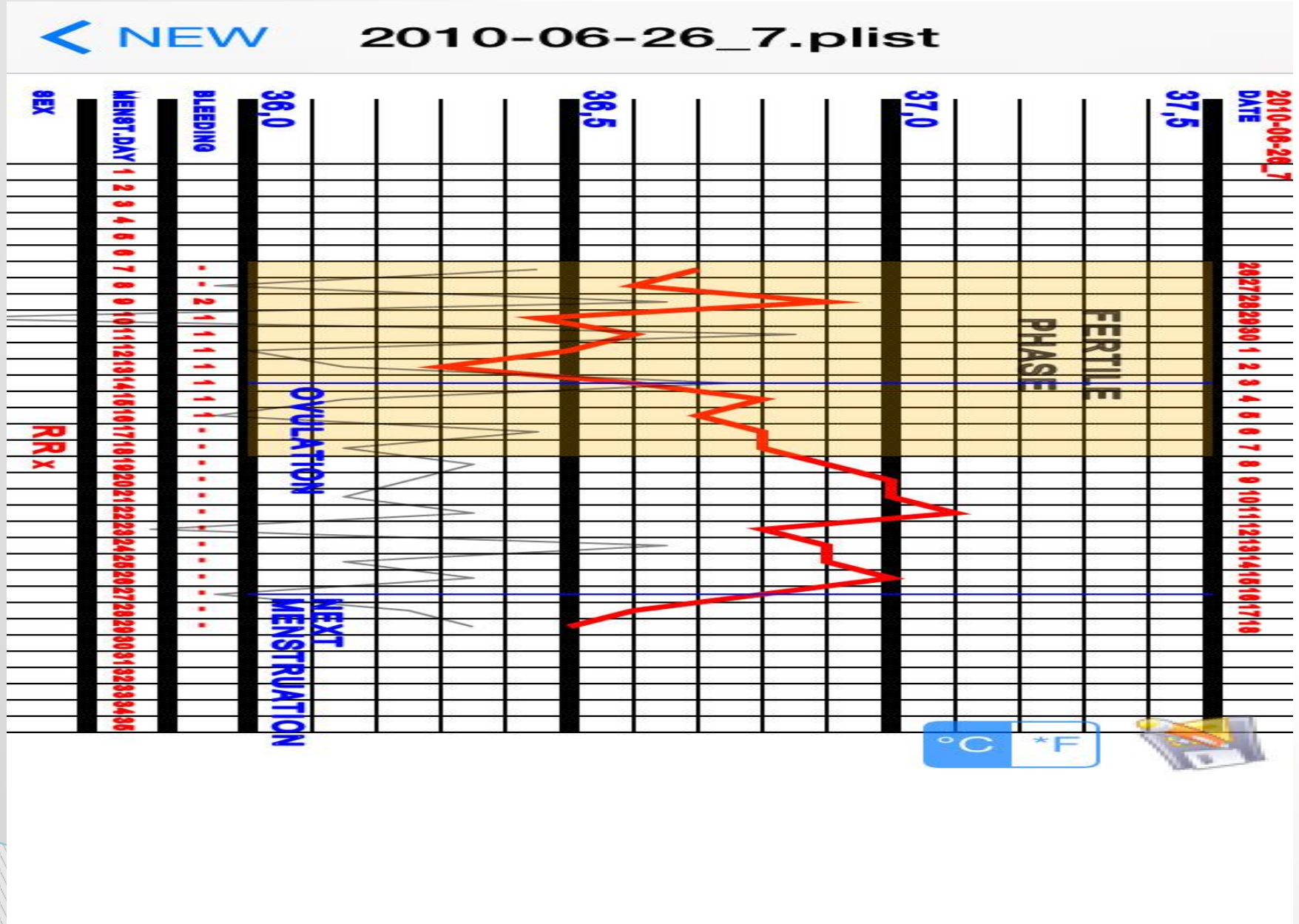
- Cervical index up to 3 numbers indicates on the expressed estrogen insufficiency, 4-6 — moderate estrogen insufficiency, 7-9 — sufficient estrogen saturation, 10-12 — high saturation. Cervical index estimates presence or absence of ovulation and cyclic changes of the organism's estrogen stimulation.

Basal temperature.

- Basal temperature (BT) changing is based on the hyper thermic influence of progesterone on hypothalamus. BT is measured in rectum in the morning regularly by the same thermometer with the empty stomach, without getting up. In first phase of menstrual cycle temperature is below 37 ˚ C (0,2-0,3˚ lower), after ovulation it rises and holds on between 37,1-37,4 ˚C. Basal temperature change indicates on presence or absence of ovulation, follicle persistence, threatened abortion and some other states. This test is simple, easily available and sufficiently objective, however one should remember, that any causes of non-hormonal character (diseases, that are accompanied with tempera ture reaction) can affect it. It is necessary to carry out measuring during 2-3 cycles. Only in this case this method has the diagnostic value.


DAYS
1
7
14
21
28
FOLLICULAR PHASE
LUTEAL PHASE
36.7°
BASAL BODY TEMPERATURE
36.4°
HORMONE LEVEL
FSH
LH
ESTROGEN
PROGESTERONE
OVUM
OVARIAN CYCLE
OVULATION
UTERINE CYCLE
MENSES
PROLIFERATIVE
SECRETORY

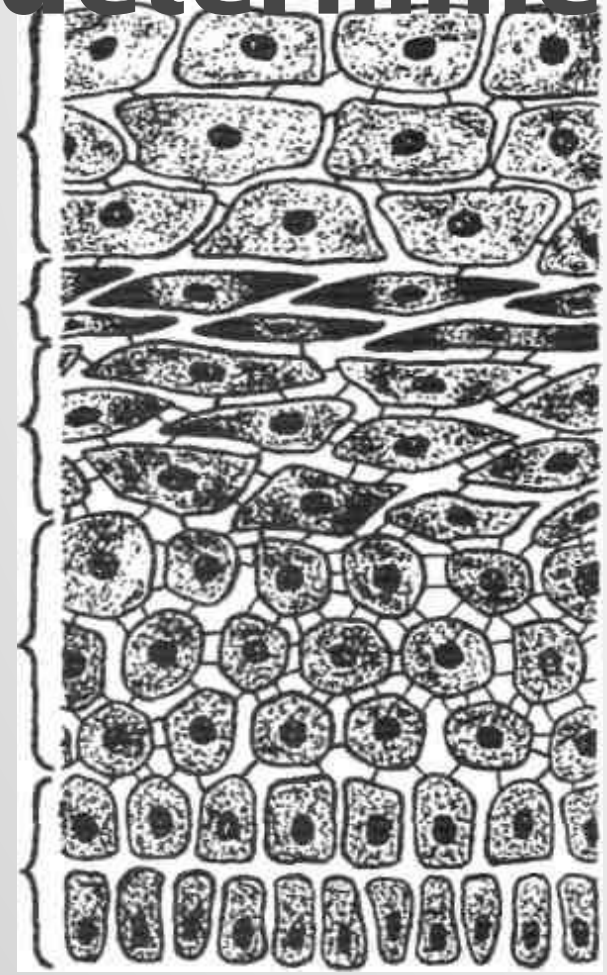

1
5
10
15
20
25
30
35
days
°C
°F
99
37
98
97
36
ovulation


NEW
2010-06-26_7.plist
DATE
2010-06-26_7
37,5
37,0
36,5
36,0
FERTILE
PHASE
OVULATION
NEXT
MENSTRUATION
BLEEDING
MENST.DAY
SEX
RR
x
°C
°F

^ Cytological examination of vaginal smears

During examining degree of estrogen saturation determines the morphology of vaginal epithelium, which is changing during menstrual cycle. Basal, parabasal, intermediate, superficial layers are distinguished in the stratified squamous epithelium of vagina. Vaginal epithelium is exposed to rhythmic changes during menstrual cycle, that is characterized by different stages of mucous membrane proliferation. According to degree of organism saturation by estrogens, superficial, intermediate and basal cells in different ratio are differed. Method of colpocyto- diagnostics is based on the determination of quantity and morphological peculiarities of epithelial cells.1

Such indexes are determined:



.

maturity index is a correlation of superficial, intermediate, parabasal and basal 2 cells ratio, expressed in percents; index is written in such a way: parabasal/inter- 3 mediate/superficial (parabasal and basal cells are counted up together)

.

- Fig. 29. Squamous vaginal epithelium:
- — superficial
- — intraepithelial
- — intermediate
- — parabasal
- — basal
- *cariopicnotic index (CPI)* is a correlation of superficial cells with picnotic nuclear and general amount of cells ratio expressed in percents. CPI is directly proportional to the degree of organism's estrogen , saturation
- *eosinophile index* — superficial cells with eosinophile cytoplasm and cells with basophilic cytoplasm ratio expressed in percents

- Cells' disposition (layers presence) and amount of the "rolled up" cells should be determined for revealing of progesterone effect on vaginal epithelium. Progesterone stimulation degree is estimated for 3-point system too: the plenty of the "rolled up cells" makes 3 points (+++), moderate amount makes 2 points (++), low quantity makes 1 point (+), undetermined cells makes 0 (-).

- **References:**

1.Danforth's Obstetrics and gynaecology. - Seventh edition.- 1994. - P. 351-464.

2.Obstetrics and gynaecology. Williams & Wilkins Waveriy Company. – Third Edition.- 1998.-P." 196-236.

3. Basic Gynecology and Obstetrics. - Norman F. Gant, F. Gary Cuimingham. 1993.-P. 444-456.

- 4. Objectives: to learn clinical anatomy and physiology of the female genital organs. Professional motivation