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Reproduction: Female Cycle & Hormones

Printable Flashcards — Pre-Med Biology

Female anatomy, HPO axis, ovarian and uterine cycles, ovulation, fertilization, implantation, and oogenesis.

196 cards — Print double-sided, flip on long edge, then cut along dashed lines.

196 cards — Printable Flashcards

Free & Open-Source

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1

Main organs of the female reproductive system (high level):

2

Ovary's main jobs are to...

3

Fallopian tube's main job is to...

4

Uterus is mainly for...

5

Cervix is basically...

6

Endometrium vs myometrium:

7

Where does implantation happen?

8

Fimbriae are...

2

Release oocytes (eggs) and produce hormones (estrogen + progesterone).

1

Ovaries, fallopian tubes (oviducts), uterus, cervix, vagina.

4

Implantation and supporting pregnancy; shedding lining during menstruation.

3

Pick up the oocyte and (usually) be the site of fertilization.

6

Endometrium = inner lining.
Myometrium = muscle wall.

5

The lower 'neck' of the uterus that opens into the vagina.

8

Finger-like projections at the end of the fallopian tube that help catch the oocyte.

7

In the endometrium of the uterus.

9

Oviduct is another name for the...

10

Most common site of fertilization is the...

11

Most common site of ectopic pregnancy is the...

12

Vagina's role in reproduction is mainly...

13

What is a follicle?

14

Corpus luteum is...

15

Corpus albicans is...

16

Dominant follicle means...

10

Ampulla of the fallopian tube.

9

Fallopian tube.

12

Receives sperm; birth canal.

11

Fallopian tube.

14

The leftover follicle after ovulation; it secretes progesterone (and some estrogen).

13

A structure in the ovary containing an oocyte + supporting cells.

16

The one follicle that outcompetes others and is most likely to ovulate.

15

The scar-like remnant after the corpus luteum degenerates.

17

If the exam says 'Graafian follicle', they mean...

18

Fertilization usually happens in the {{c1::fallopian tube}}; implantation happens in the {{c2::uterus (endometrium)}}.

19

Inner lining of the uterus is called the:

20

The HPO axis is basically: hypothalamus -> pituitary -> ovaries. What does hypothalamus release?

21

Pituitary releases the two big 'gonadotropins':

22

FSH's main target in the ovary is to...

23

LH's big moment in the cycle is...

24

Trap: FSH surge triggers ovulation. True or false?

18

Fertilization usually happens in the fallopian tube; implantation happens in the uterus (endometrium).

17

A mature follicle ready to ovulate.

20

GnRH (gonadotropin-releasing hormone).

19

Endometrium

22

Stimulate follicle growth and help granulosa cells make estrogen.

21

FSH and LH.

24

False. LH surge triggers ovulation.

23

The LH surge triggers ovulation.

25

Estrogen is mainly made by...

26

Progesterone is mainly made by...

27

GnRH is released in pulses. Why do we care (high yield idea)?

28

Negative feedback in the cycle usually means...

29

The famous exception: high sustained estrogen right before ovulation causes...

30

Progesterone usually gives what kind of feedback on GnRH/FSH/LH?

31

Inhibin's basic job is to...

32

If estrogen and progesterone fall sharply, what happens next?

26

The corpus luteum (after ovulation).

25

Developing follicles (especially granulosa cells).

28

Estrogen/progesterone tell hypothalamus/pituitary to lower GnRH/FSH/LH.

27

Because pulse patterns affect FSH/LH release; constant GnRH can actually suppress them.

30

Negative feedback.

29

Positive feedback -> LH surge.

32

Menstruation (endometrium sheds) and FSH starts rising again.

31

Inhibit FSH.

33

Why does only one follicle usually dominate even though multiple start developing?

34

Atresia means...

35

Hypothalamus releases {{c1::GnRH}} -> pituitary releases {{c2::FSH}} and {{c3::LH}} -> ovaries release {{c4::estrogen}} and {{c5::progesterone}}.

36

High sustained {{c1::estrogen}} causes positive feedback -> {{c2::LH surge}} -> ovulation.

37

Hormone surge that triggers ovulation:

38

Ovarian cycle has 3 main parts:

39

Uterine (endometrial) cycle has 3 main parts:

40

Match them: follicular phase of ovary lines up mostly with...

34

Follicle degeneration (the ones that don't make it).

33

Because FSH falls and the most sensitive follicle wins; the rest undergo atresia.

36

High sustained estrogen causes positive feedback -> LH surge -> ovulation.

35

Hypothalamus releases GnRH -> pituitary releases FSH and LH -> ovaries release estrogen and progesterone.

38

Follicular phase -> ovulation -> luteal phase.

37

LH surge

40

Proliferative phase of uterus.

39

Menstrual -> proliferative -> secretory.

41

Match them: luteal phase of ovary lines up mostly with...

42

Menstrual phase happens when...

43

Proliferative phase is driven mainly by...

44

Secretory phase is driven mainly by...

45

Ovarian follicular phase: what's happening?

46

Ovarian luteal phase: what's happening?

47

Which phase is usually more constant in length: follicular or luteal?

48

So ovulation happens about...

42

Estrogen and progesterone drop (corpus luteum dies).

41

Secretory phase of uterus.

44

Progesterone.

43

Estrogen.

46

Corpus luteum forms and secretes progesterone (and some estrogen).

45

Follicles grow; estrogen rises; one dominant follicle develops.

48

~14 days BEFORE the next period (not always day 14).

47

Luteal phase (~14 days).

49

Day 1 of the menstrual cycle is...

50

If someone has a 35-day cycle, ovulation is usually around day...

51

If someone has a 21-day cycle, ovulation is usually around day...

52

Classic trap: the uterine secretory phase happens before ovulation. True or false?

53

Ovary: {{c1::follicular}} -> ovulation -> {{c2::luteal}}. Uterus: {{c3::menstrual}} -> {{c4::proliferative}} -> {{c5::secretory}}.

54

Proliferative phase is driven by {{c1::estrogen}}; secretory phase is driven by {{c2::progesterone}}.

55

Phase of uterine cycle right after menstruation (endometrium rebuilds):

56

During early follicular phase, estrogen and progesterone are... and FSH is...

50

About day 21 (35 - 14).

49

The first day of bleeding.

52

False. Secretory phase is after ovulation.

51

About day 7 (21 - 14).

54

Proliferative phase is driven by estrogen; secretory phase is driven by progesterone.

53

Ovary: follicular -> ovulation -> luteal. Uterus: menstrual -> proliferative -> secretory.

56

Low; FSH rises a bit to recruit follicles.

55

Proliferative phase

57

As follicles grow, estrogen generally...

58

Right before ovulation, estrogen is...

59

The LH surge causes...

60

After ovulation, progesterone is...

61

During luteal phase, high progesterone does what to FSH/LH?

62

If no fertilization/implantation happens, corpus luteum...

63

If pregnancy happens, the corpus luteum is saved by...

64

What does hCG do (basic)?

58

High (and sustained).

57

Rises.

60

High (from the corpus luteum).

59

Ovulation + corpus luteum formation (luteinization).

62

Degenerates -> progesterone/estrogen drop -> menstruation starts.

61

Keeps them suppressed (negative feedback).

64

Maintains the corpus luteum early in pregnancy so progesterone stays high.

63

hCG from the embryo/placenta (early).

65

Pregnancy test detects...

66

Why can a pregnancy test be negative even if fertilization happened yesterday?

67

Estrogen has two main jobs in the cycle:

68

Progesterone's main uterine job is to...

69

Progesterone also affects cervical mucus by making it...

70

Estrogen affects cervical mucus by making it...

71

Basal body temperature after ovulation tends to...

72

If progesterone stays high, what happens to menstruation?

66

Because hCG isn't high until after implantation.

65

hCG.

68

Make the endometrium secretory and maintain it for implantation.

67

Build the endometrium + (at high levels) trigger LH surge.

70

Thin, watery, stretchy (sperm-friendly).

69

Thick and sticky (harder for sperm to pass).

72

It doesn't happen (lining is maintained).

71

Rise slightly (due to progesterone).

73

Why does progesterone drop if there's no pregnancy?

74

Which hormone is the best single marker of 'you are in luteal phase'?

75

Which hormone peak is the best marker of 'ovulation is about to happen'?

76

FSH is high at the start because...

77

Why doesn't FSH stay super high and make you ovulate like 10 eggs every cycle?

78

High sustained {{c1::estrogen}} -> {{c2::LH surge}} -> {{c3::ovulation}}.

79

After ovulation, the {{c1::corpus luteum}} makes lots of {{c2::progesterone}}.

80

Hormone that maintains corpus luteum in early pregnancy:

74

Progesterone.

73

Corpus luteum dies without hCG support.

76

The brakes (estrogen/progesterone) are low, so follicle recruitment can begin.

75

LH surge.

78

High sustained estrogen -> LH surge -> ovulation.

77

Because estrogen + inhibin reduce FSH, so only the dominant follicle survives.

80

hCG

79

After ovulation, the corpus luteum makes lots of progesterone.

81

Ovulation is...

82

Fertile window exists because...

83

How long can the oocyte be fertilized after ovulation (roughly)?

84

How long can sperm survive in the female reproductive tract (roughly)?

85

So the highest fertility is usually...

86

If an exam says 'thin stretchy egg-white mucus', that points to...

87

If an exam says 'thick sticky mucus', that points to...

88

Basal body temperature rise happens...

82

Sperm can survive days, but the oocyte survives about 1 day.

81

Release of a secondary oocyte from the dominant follicle.

84

Up to ~3-5 days (best conditions).

83

About 12-24 hours.

86

High estrogen -> near ovulation.

85

The day before ovulation and the day of ovulation.

88

After ovulation (progesterone effect).

87

High progesterone -> after ovulation (luteal phase).

89

Ovulation typically occurs when estrogen is... and progesterone is...

90

If ovulation doesn't happen (anovulation), what usually can't form properly?

91

Ovulation is triggered by...

92

What happens to the follicle after ovulation?

93

Why is the luteal phase called 'luteal'?

94

If someone has a short luteal phase, what's the big consequence?

95

If you had to pick ONE hormone that prepares the uterus for implantation, pick...

96

Egg is viable ~{{c1::12-24 hours}}, but sperm can survive ~{{c2::3-5 days}}.

90

Corpus luteum -> progesterone rise is missing.

89

High; still low (progesterone rises after ovulation).

92

It becomes the corpus luteum.

91

A spike in LH (LH surge).

94

Less progesterone support for endometrium -> harder implantation/maintenance.

93

Because of the corpus luteum (yellow body).

96

Egg is viable ~12-24 hours, but sperm can survive ~3-5 days.

95

Progesterone.

97

Thin, stretchy 'egg-white' cervical mucus suggests high:

98

Fertilization (sperm + egg) usually happens in the...

99

Implantation usually happens about...

100

If implantation happens, what hormone starts rising and 'saves' the cycle?

101

hCG is made by...

102

If hCG is present, what does that mean in a standard context?

103

Why doesn't menstruation happen during pregnancy?

104

Which structure makes progesterone in the first weeks of pregnancy?

98

Fallopian tube (ampulla).

97

Estrogen

100

hCG.

99

6-10 days after ovulation (roughly).

102

Implantation has occurred (pregnancy).

101

The trophoblast/early placenta cells (from the embryo side).

104

Corpus luteum (maintained by hCG).

103

Progesterone stays high, maintaining the endometrium.

105

Later in pregnancy, progesterone production is mainly by...

106

If the corpus luteum fails early and progesterone drops, what risk increases?

107

Ectopic pregnancy is dangerous mainly because...

108

Placenta basics: it mainly...

109

Pregnancy test timing: best practice is to test...

110

hCG maintains the {{c1::corpus luteum}} so {{c2::progesterone}} stays high and menstruation doesn't occur.

111

Most common site of fertilization:

112

Oogenesis is the process of making...

106

Miscarriage (loss of endometrial support).

105

The placenta.

108

Exchanges nutrients/gases/waste between mother and fetus and produces hormones.

107

The tube can't expand safely, and bleeding can be life-threatening.

110

hCG maintains the corpus luteum so progesterone stays high and menstruation doesn't occur.

109

After a missed period / ~2 weeks after ovulation.

112

Oocytes (female gametes).

111

Ampulla of fallopian tube

113

Big oogenesis idea: females are born with...

114

Primary oocyte is arrested in which meiotic stage for years?

115

When does a primary oocyte complete meiosis I?

116

What cell is actually ovulated?

117

Secondary oocyte is arrested in which stage until fertilization?

118

When does meiosis II complete in females?

119

So when is the true 'ovum' formed?

120

Polar bodies exist because...

114

Prophase I.

113

Primary oocytes arrested in prophase I.

116

Secondary oocyte (not a full ovum yet).

115

Just before ovulation.

118

Only after fertilization.

117

Metaphase II.

120

Oogenesis makes one big gamete + tiny polar bodies to keep cytoplasm in the egg.

119

After completion of meiosis II (after fertilization).

121

How many functional gametes come from one primary oocyte?

122

Compare: spermatogenesis from one primary spermatocyte produces...

123

Meiosis I is special because it separates...

124

Meiosis II is more like mitosis because it separates...

125

Crossing over happens in...

126

Chiasmata are...

127

Nondisjunction means...

128

Why does maternal age increase the risk of nondisjunction (high-level)?

122

Four functional sperm.

121

One (plus polar bodies).

124

Sister chromatids.

123

Homologous chromosomes
(and includes crossing over).

126

The visible points where crossing over occurred between homologous chromosomes.

125

Prophase I.

128

Because oocytes are arrested for a long time, increasing the chance of errors when meiosis resumes.

127

Chromosomes fail to separate properly in meiosis (or mitosis).

129

Meiosis reduces chromosome number because...

130

In humans, haploid number (n) is...

131

Fertilization restores diploid number by combining...

132

Trap: ovulation releases a diploid cell. True or false?

133

Primary oocyte is arrested in {{c1::prophase I}}; secondary oocyte is arrested in {{c2::metaphase II}}.

134

Meiosis I separates {{c1::homologous chromosomes}}; meiosis II separates {{c2::sister chromatids}}.

135

Meiotic stage where crossing over happens:

136

Meiosis I phases in order:

130

23.

129

It includes one round of DNA replication but two rounds of division.

132

False (it's haploid, but still has sister chromatids).

131

Two haploid gametes ($n + n = 2n$).

134

Meiosis I separates homologous chromosomes; meiosis II separates sister chromatids.

133

Primary oocyte is arrested in prophase I; secondary oocyte is arrested in metaphase II.

136

Prophase I -> Metaphase I -> Anaphase I -> Telophase I.

135

Prophase I

137

Key event in Prophase I:

138

Synapsis means...

139

Metaphase I: what's lined up at the equator?

140

Anaphase I: what separates?

141

After meiosis I, cells are...

142

Meiosis II phases in order:

143

Metaphase II: what's lined up at the equator?

144

Anaphase II: what separates?

138

Pairing of homologous chromosomes.

137

Homologous chromosomes pair (synapsis) and crossing over happens.

140

Homologous chromosomes separate (sister chromatids stay together).

139

Pairs of homologous chromosomes (tetrads).

142

Prophase II -> Metaphase II -> Anaphase II -> Telophase II.

141

Haploid (n) but chromosomes are still duplicated.

144

Sister chromatids separate.

143

Single chromosomes (still duplicated).

145

Independent assortment happens because... (concept)

146

Two sources of genetic variation from meiosis are...

147

In meiosis I, _____ separate.

148

In meiosis II, _____ separate.

149

Metaphase I lines up {{c1::homologous pairs}}; metaphase II lines up {{c2::single chromosomes}}.

150

Scenario: Progesterone is high. Which phase are you most likely in?

151

Scenario: Estrogen is rising and endometrium is rebuilding. Which uterine phase is this?

152

Scenario: There's a sudden LH spike. What should happen soon after?

146

Crossing over + independent assortment.

145

Homologous pairs line up randomly in metaphase I.

148

Sister chromatids

147

Homologous chromosomes

150

Luteal phase (secretory uterine phase).

149

Metaphase I lines up homologous pairs; metaphase II lines up single chromosomes.

152

Ovulation.

151

Proliferative phase.

153

Scenario: A woman's cycle is very irregular. Which phase is most likely varying in length?

154

Scenario: A person has a 40-day cycle. Around what day is ovulation likely?

155

Scenario: Cervical mucus is thick and sticky. Fertility right now is usually...

156

Scenario: Cervical mucus is thin and stretchy. Fertility right now is usually...

157

Scenario: Basal body temperature just jumped up. Ovulation likely...

158

Scenario: Progesterone suddenly drops. What event is about to happen?

159

Scenario: A pregnancy test is positive. What is the body definitely making?

160

Scenario: An embryo implants. What immediate hormonal 'rescue' prevents the period?

154

Around day 26 (40 - 14).

153

Follicular phase.

156

Higher (near ovulation / estrogen).

155

Low (post-ovulation / progesterone).

158

Menstruation.

157

Already happened.

160

hCG maintains corpus luteum
-> progesterone stays high.

159

hCG.

161

Scenario: No fertilization. What happens to corpus luteum?

162

Scenario: A question says 'secondary oocyte arrested in metaphase II'. What has not happened yet?

163

Combined oral contraceptive pill works mainly by...

164

Another contraceptive effect of progesterone (progestin) is...

165

Emergency contraception works best when taken...

166

Trap: birth control pills 'kill sperm' directly. True or false?

167

IUD (high level) works mainly by...

168

Menarche means...

162

Fertilization (completion of meiosis II).

161

It degenerates into corpus albicans.

164

Thickening cervical mucus.

163

Preventing the LH surge (so no ovulation).

166

False.

165

Before ovulation (to delay/prevent it).

168

First menstrual period.

167

Making the uterus hostile to fertilization/implantation (type-dependent).

169

Menopause means...

170

After menopause, estrogen and progesterone are generally...

171

Classic hormone pattern after menopause: FSH is often...

172

Puberty starts when the hypothalamus increases...

173

Endocrine vocab: 'gonadotropin' refers to...

174

Endocrine vocab: 'trophic hormone' means...

175

Don't confuse: follicular phase is dominated by...; luteal phase is dominated by...

176

Don't confuse: ovulation trigger is...; follicle growth hormone is...

170

Lower.

169

Permanent end of menstrual cycles (ovaries stop ovulating regularly).

172

GnRH pulses.

171

High (less negative feedback).

174

A hormone that stimulates another endocrine gland.

173

FSH and LH (hormones that act on gonads).

176

LH; FSH.

175

Estrogen; progesterone.

177

Don't confuse: menstruation happens when hormones are...; secretory phase happens when progesterone is...

178

Don't confuse: fertilization site...; implantation site...

179

Don't confuse: primary oocyte arrest...; secondary oocyte arrest...

180

Don't confuse: meiosis I separates...; meiosis II separates...

181

Don't confuse: ovulated cell is...; true ovum is formed after...

182

Don't confuse: uterine proliferative phase is driven by...; uterine secretory phase is driven by...

183

Rule of thumb: Luteal phase length is about...

184

If someone ovulates on day 18, their next period is expected around day... (if not pregnant)

178

Fallopian tube (ampulla); uterus (endometrium).

177

Low; high.

180

Homologous chromosomes; sister chromatids.

179

Prophase I; metaphase II.

182

Estrogen; progesterone.

181

Secondary oocyte; fertilization completes meiosis II.

184

About day 32 (18 + 14).

183

~14 days.

185

If a cycle is 30 days long,
ovulation is likely around day...

186

If a person wants to estimate fertile days
in a 28-day cycle, a safe basic window is...

187

Trap: Fertile window is only the
exact day of ovulation. True or false?

188

Day 1 of the menstrual cycle =
first day of {{c1::bleeding}}.

189

Proliferative (uterus) aligns with {{c1::follicular}}
(ovary). Secretory aligns with {{c2::luteal}}.

190

Ovulation is triggered by {{c1::LH surge}}, which
is triggered by high sustained {{c2::estrogen}}.

191

Progesterone high -> uterus in {{c1::secretory}}
phase and cervical mucus becomes {{c2::thick}}.

192

Hormone that builds the endometrium
in the first half of the cycle:

186

Around days 10-15 (roughly).

185

About day 16 (30 - 14).

188

Day 1 of the menstrual cycle = first day of bleeding.

187

False.

190

Ovulation is triggered by LH surge, which is triggered by high sustained estrogen.

189

Proliferative (uterus) aligns with follicular (ovary). Secretory aligns with luteal.

192

Estrogen

191

Progesterone high -> uterus in secretory phase and cervical mucus becomes thick.

193

Hormone that maintains endometrium after ovulation:

194

Cell released at ovulation (most correct term):

195

Stage where secondary oocyte is arrested until fertilization:

196

Stage where primary oocyte is arrested for years:

194

Secondary oocyte

193

Progesterone

196

Prophase I

195

Metaphase II