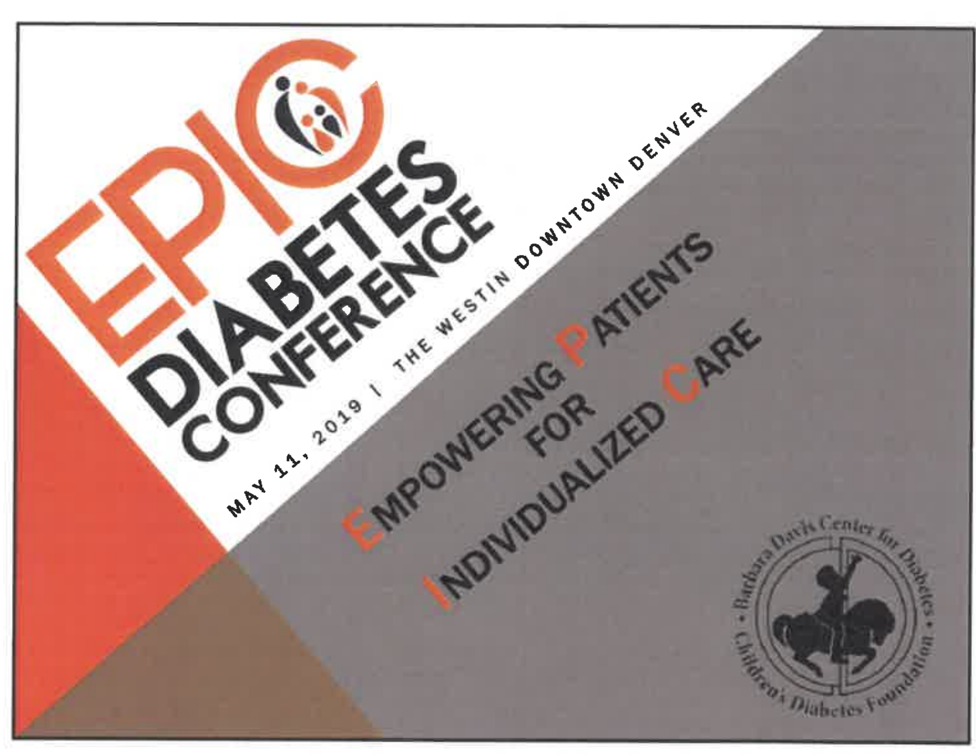
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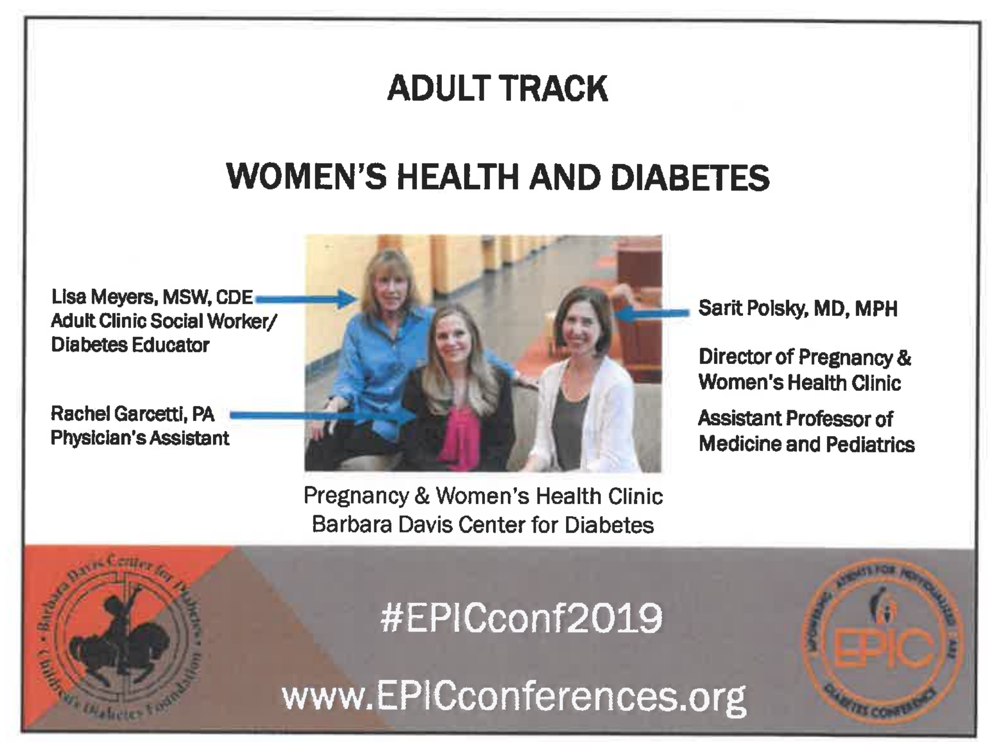
ADULT TRACK
WOMEN'S HEALTH AND DIABETES
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COI
(IF ANY)

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OUTLINE

- Menstrual cycles
- Contraception
- Pregnancy
- Menopause
- Mental health in women with diabetes

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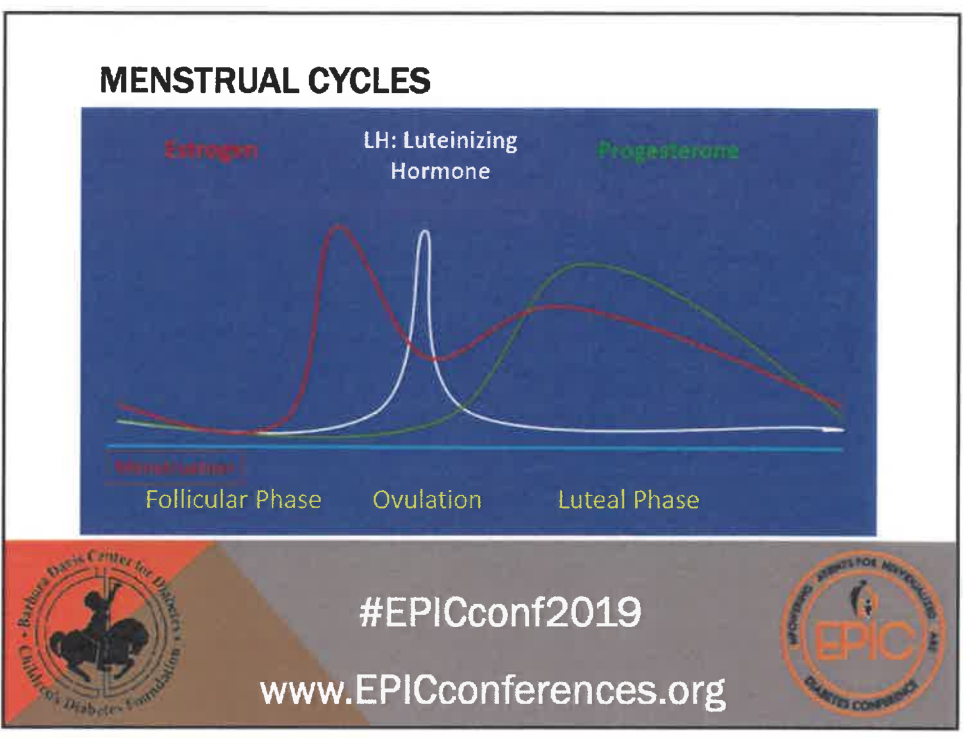
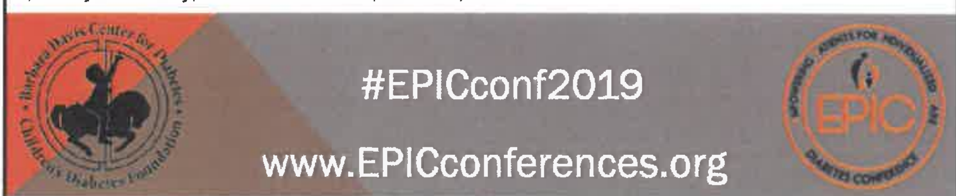


MENSTRUAL CYCLES

- Women with T1D experience more menstrual irregularity than those without it.
- During menstruation, glucose can range (↑, →, ↓), depending on the woman.
- Insulin resistance changes over the cycle.
- Not every woman has a consistent pattern in glucose variability.
- The most common glucose pattern is luteal phase hyperglycemia.

Walsh CH, Malins JM, *Br Med J*, 1977. Schroeder B et al, *J of Repro Med*, 2000. Goldner WS et al, *DTT*, 2004. Gaete X et al, *Fertility and Sterility*, 2010. Barata DS et al, *Diab Care*, 2013.

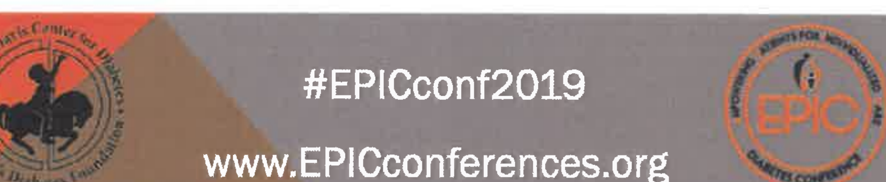


MENSTRUAL CYCLES

- Hormone-based contraception can regulate and improve cycle variability and symptoms. Please consult with a medical professional.
- Closely monitor at least 3 menstrual cycles with frequent finger-sticks and/or CGM to identify if a consistent glucose pattern exists.
- Control glucose levels as much as possible.
- Adjust insulin doses to limit the glucose extremes.

The *greater* the obstacle, the more glory in *overcoming* it.

Schroeder B et al, *J of Repro Med*, 2000. Arrais RF, Dib SA, *Human Repro*, 2006. Gaete X et al, *Fertility and Sterility*, 2010. Bahamondes L et al, Human Repro Update, 2015.



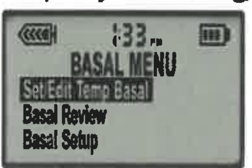
MENSTRUAL CYCLES

- Insulin pumps have some features that could be beneficial:

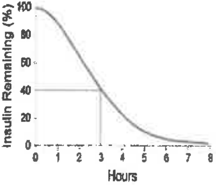
-different basal patterns,

Time of Day	Basal Level (units/hr)
12 AM – 5 AM	0.70
5 AM – 8 AM	0.90
8 AM – 1 PM	0.60
1 PM – 10 PM	0.50
10 PM – 12 AM	0.60

-temporary basal setting,



-active insulin on board.



- When on shots, think ahead to adjust insulin.

Polsky S et al, *Postgrad Med*, 2016.

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CONTRACEPTION

	Daily or Weekly	Daily	LARC for Weeks	Long-Acting Reversible Contraception (LARC) for Years		
Condition	CHC	Progestin-Only Pill	DMPA/ NET-EN	Implants	Copper IUD	Hormonal IUD
Nonvascular Insulin-dependent diabetes	2 (3/4 if DM duration >20 years)	2	2 (3 if DM duration >20 years)	2	1	2
Neuropathy/ retinopathy/ neuropathy	3/4	2	3	2	1	2
Other vascular disease	3/4	2	3	2	1	2

WHO Medical Eligibility Criteria (2015)

1 = Use method in any circumstance
2 = Generally use method
3 = Use of method not generally recommended unless other more appropriate methods are not available or not acceptable
4 = Method not to be used

Abbreviations: CHC, combined hormonal contraception; DMPA/NET-EN: medroxyprogesterone acetate/norethisterone enanthate; IUD: intrauterine device

Robinson A, et al. Open Access J Contracept. 2016 Mar 3;7: 11-18. WHO. Medical Eligibility Criteria Wheel for Contraceptive Use. 2015

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CONTRACEPTION

- Barrier methods of contraception in women with diabetes:
  - -Diaphragms
  - -Cervical caps
  - -Male and female condoms
  - -Spermicide
  - -Natural family planning
- Female sterilization (1/200 failure rate)
- Male sterilization (1/2,000 failure rate)
- Emergency contraception: CHC, levonorgestrel, ulipristal acetate, copper IUD

Robinson A, et al. Open Access J Contracept. 2016 Mar 3;7: 11-18. WHO. Medical Eligibility Criteria Wheel for Contraceptive Use. 2015

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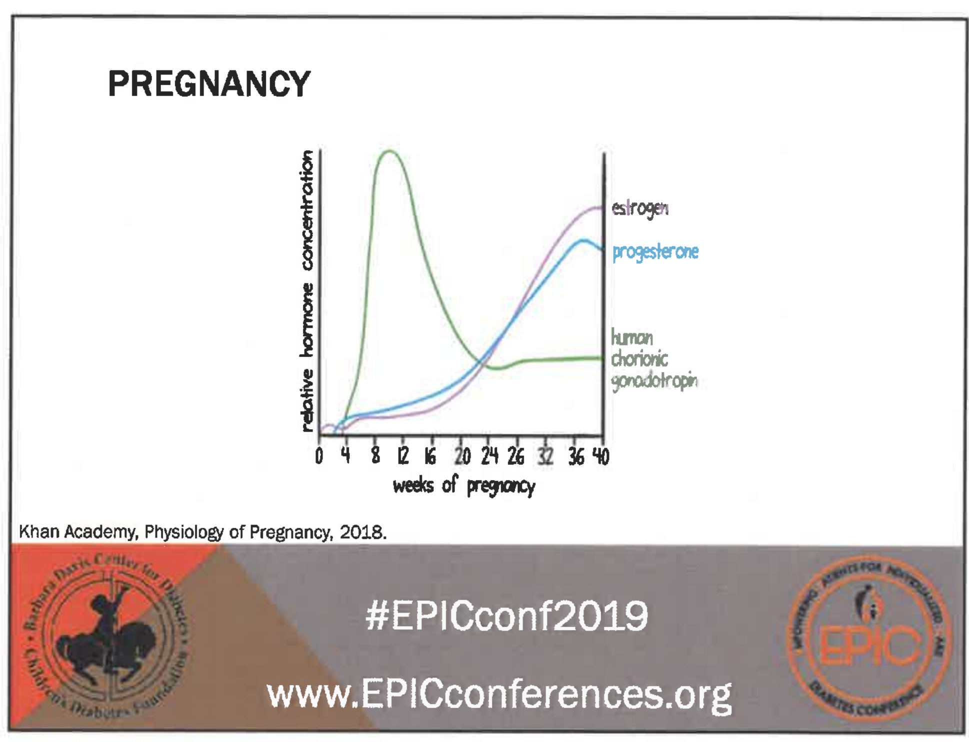
PREGNANCY



Khan Academy, Physiology of Pregnancy, 2018.

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PREGNANCY

Measurement	Target with Preexisting Diabetes	Target with Significant Hypoglycemia
Hemoglobin A1C (A1C)	<6%	
Fasting glucose	60-99 mg/dL	<105 mg/dL
Postprandial glucose	100-129 mg/dL	1-hour: <155 mg/dL 2-hour: <130 mg/dL

Aim to achieve these targets if they can be met without significant hypoglycemia.

ADA. Management of diabetes in pregnancy. Diabetes Care 2016: 39 Suppl 1: S94-S98.

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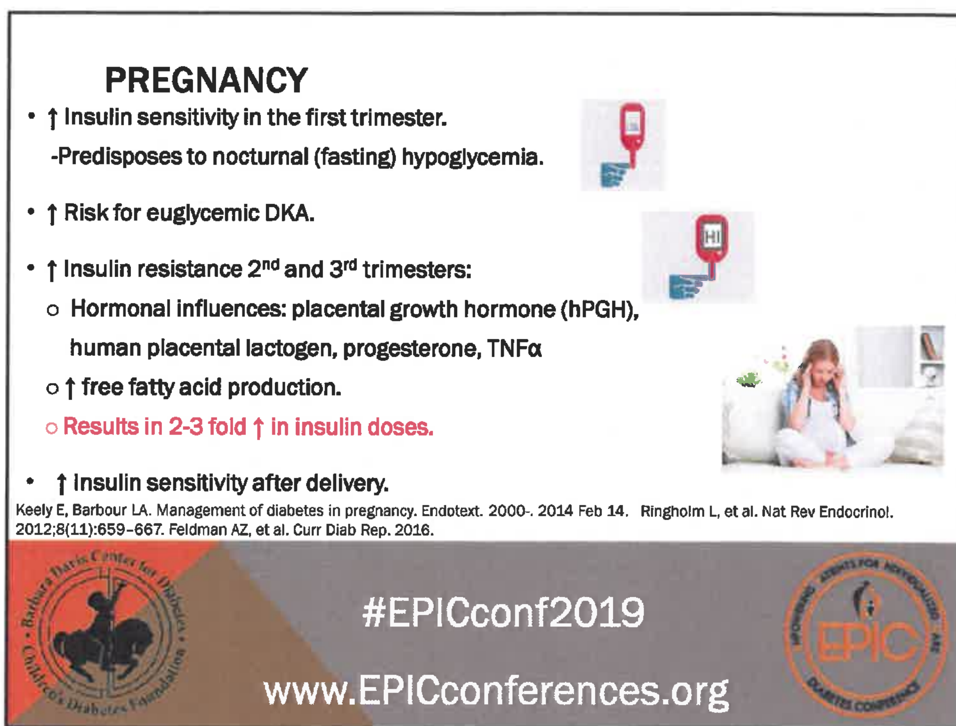
PREGNANCY
• ↑ Insulin sensitivity in the first trimester.
-Predisposes to nocturnal (fasting) hypoglycemia.
• ↑ Risk for euglycemic DKA.
• ↑ Insulin resistance 2nd and 3rd trimesters:
o Hormonal influences: placental growth hormone (hPGH), human placental lactogen, progesterone, TNFα
o ↑ free fatty acid production.
o Results in 2-3 fold ↑ in insulin doses.
• ↑ Insulin sensitivity after delivery.
Keely E, Barbour LA. Management of diabetes in pregnancy. Endotext. 2000-. 2014 Feb 14. Ringholm L, et al. Nat Rev Endocrinol. 2012;8(11):659-667. Feldman AZ, et al. Curr Diab Rep. 2016.
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PREGNANCY
• Hyperglycemia is associated with numerous adverse maternal and fetal outcomes.
Miscarriage
Pre-Eclampsia
What should I know about fetal macrosomia?
Neonatal Hypoglycemia
Keely and Barbour, EndoText, 2014; Kitzmiller JL et al, Diabetes Care, 2008; Evers IM et al, Diabetes Care, 2002.
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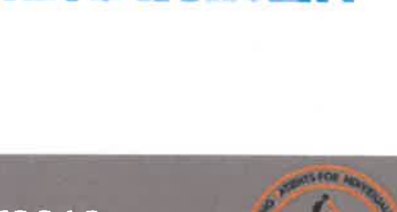
PREGNANCY

- Obstetrician or maternal-fetal specialist (preferably high-risk providers)
- Diabetes provider (diabetologist or endocrinologist)
- Certified diabetes educator
- Registered dietician
- Nurse
- Social worker
- Ophthalmologist or optometrist
- Nephrologist (if needed)
- Cardiology (if needed)
- Pediatrician or neonatologist



Medical Management of Type 1 Diabetes, 6th Ed. 2012.

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MENOPAUSE

- Natural menopause is defined as the permanent cessation of menstrual periods for 12 months, without other obvious pathologic or physiologic causes.
- The menopausal transition can take years.
- Symptoms include hot flashes, sweating, sleep disturbance, depression, vaginal dryness, sexual dysfunction, changes in thinking (memory, concentration), and joint pain.
- Symptoms common to menopause and hypoglycemia: hot flashes, sweating.
- Symptoms common to menopause and diabetes complications: vaginal dryness and decreased libido.
- It is unclear if women with T1D and T2D undergo menopause earlier than women without diabetes (studies are inconsistent).

UpToDate: Clinical manifestations and diagnosis of menopause, 2019. Szmuilowicz et al, Nat Rev Endocrinol, 2009.

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MENOPAUSE

- There are multiple options (prescribed and over-the-counter) available to treat symptoms.
- Hormone replacement therapy (HRT) includes estrogen. Progestin is added (all the time or cyclically) to protect the uterine lining in women who still have a uterus.
  - Can only be used for a limited time period around menopause.
  - Consult a medical professional.
  - Can increase the risk for some serious medical conditions.
  - There aren't enough studies in women with diabetes, so guidelines are sparse.

- Other vulnerable conditions during menopause: osteopenia/osteoporosis, cardiovascular disease, dementia, cancer, etc.

Szmuilowicz et al, Nat Rev Endocrinol, 2009. Stuenkel, Climacteric, 2017.

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With the right tools, education, and partnership with a provider, women with diabetes can often overcome challenges during menstrual cycles, pregnancy, and menopause.

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MENSES AND EMOTION

TYPICAL PMS SYMPTOMS

- Mood swings
- Depression/sadness
- Tension, anxiety
- Angry, irritable
- Fatigue, low energy
- Appetite changes

DIABETES AND PMS

- Mood shifts create fluctuating blood sugars
- Fluctuating blood sugars cause increased anxiety, diabetes distress
- Feeling depressed can cause decrease in motivation to take care of diabetes
- Variable bg per cycle causes discouragement/feelings of failure
- Hunger, higher bg, more insulin, more insulin resistance, weight gain
- Too tired to deal with diabetes demands

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PREGNANCY AND DIABETES

- Joy and fear at the same time
- Self-doubt about ability to handle the challenging guidelines
- Overwhelmed that your blood sugars are affecting the life inside of you
- Feeling pressure to do everything as perfectly as possible
- Constant worry over having a healthy baby
- Diabetes specific distress greater than before
- Stress of managing diabetes and daily life
- Anxiety about increased medical expenses

STRATEGIES FOR MANAGING PREGNANCY CHALLENGES

- **Pre-conception counseling/planning → sense of control, establishes expectations
- Share your thoughts and fears with your healthcare team: doctors, diabetes educator, social worker → relieve anxiety, gain support/validation
- Ask someone to come to appointments with you
- Ask for and accept help from family and friends
- For pre-existing depression, talk to your OB about medications you are on
- Consider diabetes technology → better sense of control over bg and ability to feel connected and to get frequent feedback from healthcare team

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MENOPAUSE

Typical emotional symptoms menopause: unusually moody, depressed, irritable, forgetful, body changes

With diabetes:

"My blood sugars are increasingly variable, without any rhyme or reason" → self-blame, feeling of failure, diabetes distress

"I'm not myself, I'm anxious and depressed" → feeling out of control, less motivated for diabetes care, isolated

"I'm eating the same as I always have and I'm gaining weight" → discouraged, hopeless, angry

"These hotflashes make me feel like I have a low bg" → confused, out of control

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A WOMAN'S JOURNEY WITH DIABETES:

- Experience of diabetes in women is unique
- Hormonal issues are related to diabetes care
- Menopause is not a bad word!
- Emotional/mental health as important as physical health
- Mental health professionals can help
- No textbook/rules for diabetes and emotional health
- Talk, open up about your own experiences

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Thank You

Questions?

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MENSTRUAL CYCLES

Follicular phase:

- -from bleeding to just before ovulation (~half the cycle, 14-21 days)
- -some follicles inside the ovary grow

Ovulation:

- -occurs around the mid-point of the cycle
- -one follicle or "egg" is released

Luteal phase:

- -the last 14 days of the cycle
- -the corpus luteum, remains of released follicle within the ovary, decays and the lining of the uterus thickens

Welt CK. Physiology of the normal menstrual cycle. UpToDate. 2017.