

What are the 5 things that can affect puberty?

Hormonal, genetics, social, environment, nutritional

What drives puberty?

GnRH

What does puberty begin with?

A “kiss” – the kisspeptin neuron is functional

What is puberty? Slow or fast progression?

The ability to accomplish reproduction successfully

SLOW

What are the signs of puberty? what does it depend on?

Ovulation, semen production, and mating response ; body size, environment, social cues (olfactory recognition), genetics

What is the key central event of puberty?

GnRH stimulates gonadotropins (LH/FSH) which allows for gametogenesis (spermatogenesis / oogenesis) and development of reproductive tissues

Describe some differences between male and female endocrine profiles and hypothalamic structures

Female: surge center present due to feminization of hypothalamus ; GnRH surges ; LH surge ~20 days (tonic surges as well)

Male: NO surge center ; tonic release of GnRH/LH/T

Describe the onset of puberty in females

- Age at 1st estrus (standing heat): shows outward behavioral signs of sexual receptivity,
- Age at 1st ovulation: palpate ovary for determination
- Age at which pregnancy can be supported without deleterious effects: female must cross a “metabolic threshold” before attaining puberty

Describe the onset of puberty in males

- Expression of behavior: mounting and erection
- Age of 1st ejaculation: sperm may not be viable yet
- Age when spermatozoa appear: collect once a week
- Age when threshold of spermatozoa is reached: minimum # of spermatozoa to achieve pregnancy

What are GnRH neurons influenced by?

Plane of nutrition (Body condition score)

Exposure to environmental and social cues (season, opposite sex is present, density of group housing)

Genetics (breed variation)

What is the limiting factor in attaining puberty?

Quantity of GnRH = limiting factor for male/female puberty attainment

- Pre-puberty: low GnRH/LH/FSH release (can be encouraged with exogenous GnRH)
- Onset of puberty: changes to tonic/surge centers
 - o Increase in gonadotropins
 - o Folliculogenesis/spermatogenesis occur
 - o Full development of surge/tonic center

Puberty attainment depends on GnRH neuron maturation.

Need enough GnRH and correct frequency