

The background of the slide features a large, detailed illustration of a red, textured egg cell on the right side. Several sperm cells are shown swimming towards the egg from the left. The sperm cells have long, thin tails and heads with a red nucleus. The overall background is a dark purple gradient.

LECTURE 2 :

Investigating infertile couple

OUTLINES

- Infertility / subfertility
- Clinical history and physical examination
- Causes and endocrine investigations of subfertility in men and women
- Conclusions



Infertility / subfertility*

- ❑ **Failure of a couple to conceive after one year of regular, unprotected intercourse**
- ❑ A number of investigations for the diagnosis of infertility exists
(But there is no agreement on which tests are essential before reaching the exact diagnosis)

What information should be obtained from patient's:

History

Previous pregnancies

Use of contraceptives

Serious illness

Chemo / radiotherapy

Congenital abnormalities

Drug usage

Sexually transmitted disease

Frequency of intercourse

Physical examination

Hypothalamo-pituitary

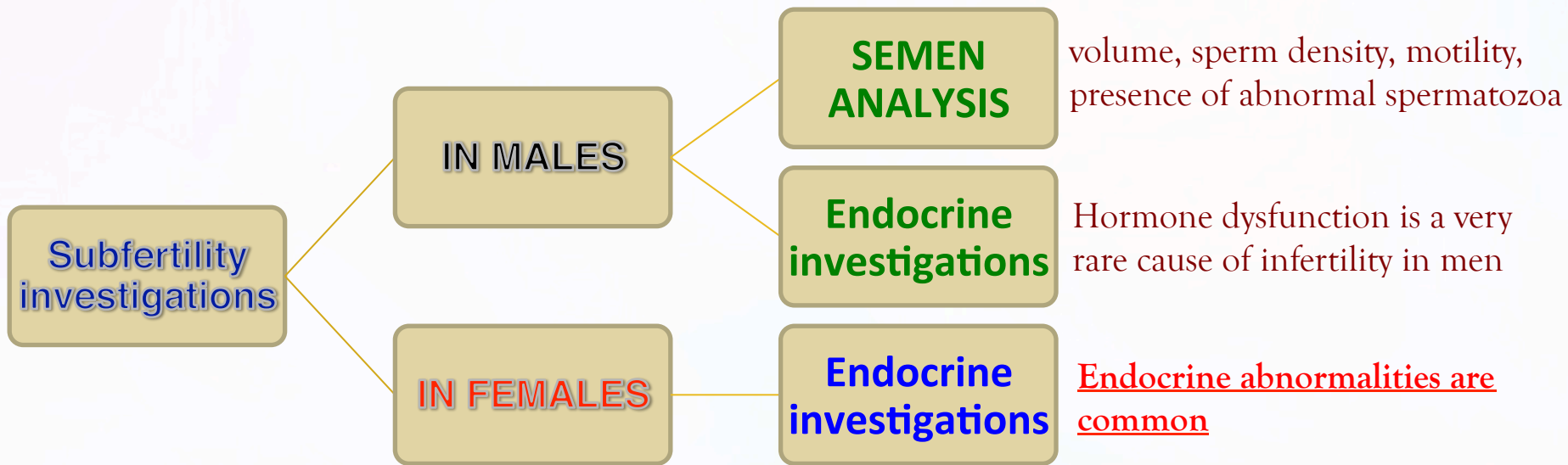
thyroid disorders

Cushing's syndrome

Galactorrhea

Hirsutism

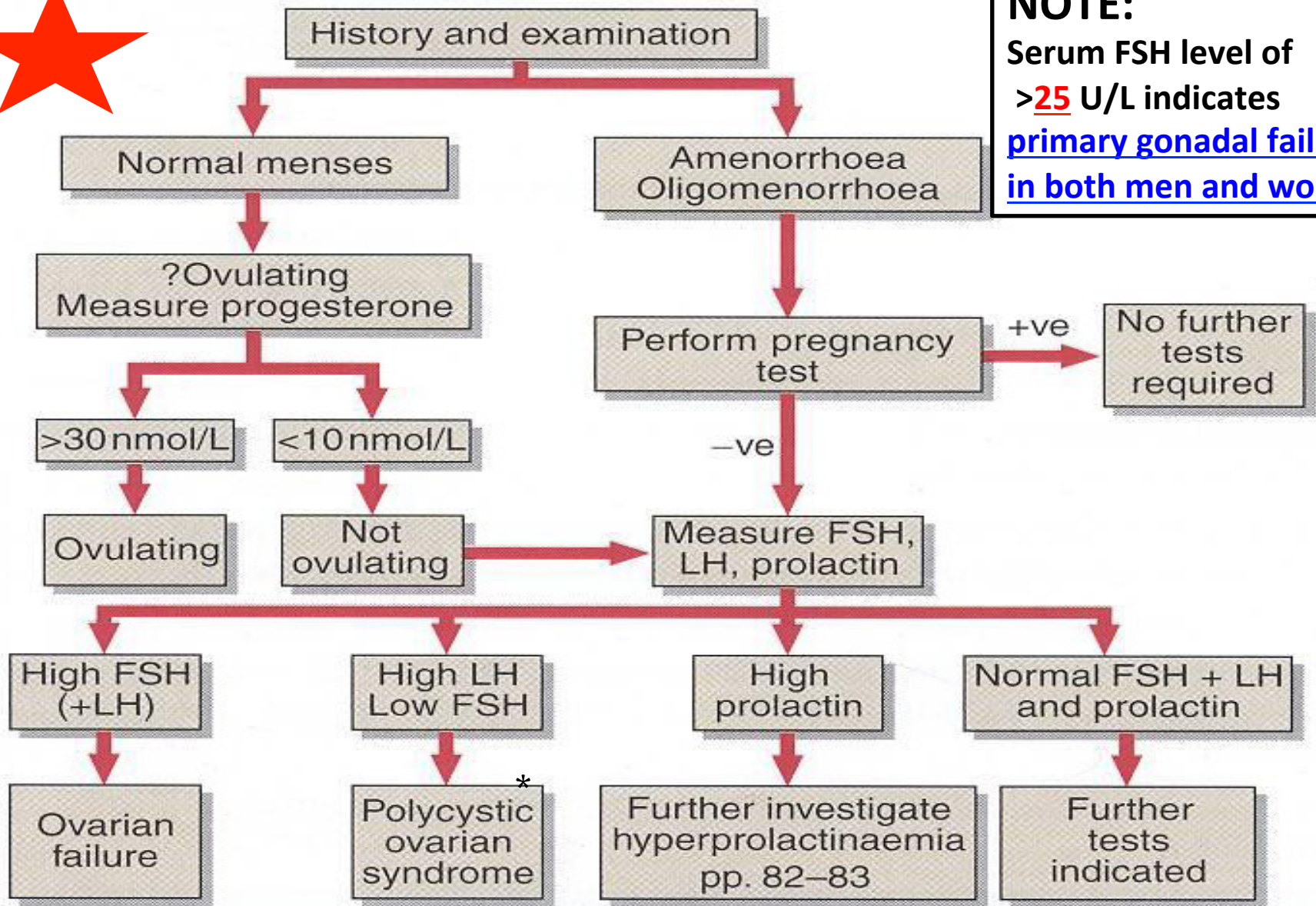
* As the inability is often not absolute, the term (subfertility) is preferred.



In some couples no cause can be detected

Endocrine investigations in the subfertile women

- They depend on the phase of the menstrual cycle
- Presence of ovulation is confirmed by measuring progesterone levels at day 21:
 - IF progesterone levels >30 nmol/L => **Indicates ovulation**
 - IF progesterone levels <10 nmol/L => **NO ovulation**
- They are of diagnostic value for women who have:
 1. **Irregular or no menstruation**
 2. **No ovulation**



NOTE:
Serum FSH level of **>25 U/L** indicates **primary gonadal failure** in both men and women

Fig. 1 Diagnostic approach to subfertility in the woman.

* PCOS is a cause of subfertility in women.

Causes of subfertility in women

Endocrine causes are more common in women

Cushing's syndrome

- ❑ Overproduction of cortisol by the adrenal cortex
- ❑ Prolonged exposure of body tissues to cortisol or other glucocorticoids
- ❑ Causes infertility in women due to:
Increased production of androgens and Hirsutism

Hyperprolactinemia

- ❑ Prolactin is a hormone secreted by anterior pituitary gland
 - ❑ It acts directly on the mammary glands to control lactation
 - ❑ Gonadal function is reduced by elevated levels of prolactin
 - ❑ Can cause infertility in both sexes
- => IN FEMALES:
Causes amenorrhea and galactorrhea
- => IN MALES:
No early signs are present
- ❑ **Causes of hyperprolactinemia:**
Stress Drug usage*
Acute seizures Pituitary disease

Primary ovarian failure

caused by
↑ gonadotropins
and ↓ estradiol levels

(post-menopausal pattern)

Hormone replacement therapy can be given

Excessive androgen secretion by ovaries

Due to :
Obesity and Insulin resistance

*e.g. oestrogens, phenothiazines, metoclopramide, α-methyl dopa

Endocrine investigations in the subfertile men

- ❑ Eugonadal men with normal sperm analysis: do not require endocrine investigations
- ❑ In hypogonadal men: Testosterone and gonadotropins should be measured

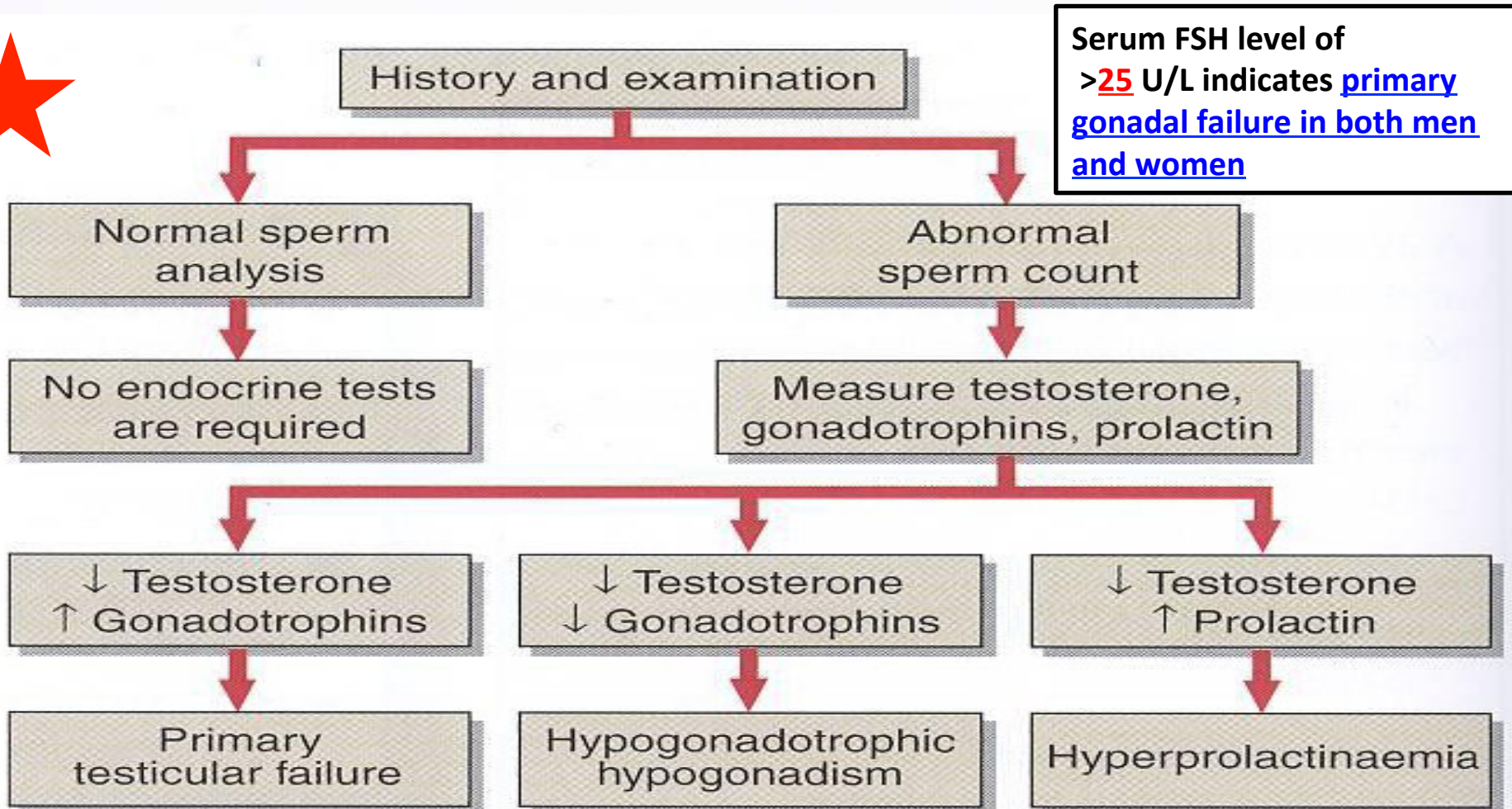


Fig. 2 **Diagnostic approach to subfertility in the man.**

Causes of subfertility in men

Primary testicular failure due to:

- Damage in the testes
- Low levels of testosterone

Hypothalamic-pituitary disease:

- Decreased testosterone with low gonadotropins suggests :
hypogonadotrophic hypogonadism

Hyperprolactinemia

- (a rare cause)

SUMMARY

- Infertility (subfertility) is defined as the failure of a couple to conceive after one year of regular, unprotected intercourse
- Endocrine problems are common cause of Infertility in the female but rare in the males.
- Semen analysis is the best investigation for infertility in males (Endocrine investigation done in a hypogonadal male only)
- Causes of subfertility in men:
 - ✓ Primary testicular failure: there's damage to both the interstitial cells and tubules and cause elevation in Gonadotropins and decrease levels of testosterone
 - ✓ Hypothalamic-pituitary disease
 - ✓ Hyperprolactinemia: Raised TRH (as in hypothyroidism) will stimulate prolactin and cause hyperprolactinaemia.
- Endocrine investigations in the subfertile women depend on the phase of the menstrual cycle
 - ✓ Elevated serum [progesterone] at day 21 of the menstrual cycle indicates that ovulation has occurred.
 - ✓ IF progesterone levels <10 nmol/L => NO ovulation
- In both men & women infertility, a serum [FSH] > 25 U/L indicates primary gonadal failure.
- Causes of subfertility in women:

Cushing's syndrome, Primary ovarian failure, Hyperprolactinemia, Excessive androgen secretion by ovaries, PCOS.

Test yourself

1. In both men & women infertility, a serum [FSH] > indicates primary gonadal failure:

- A. 50U/L
- B. 25U/L
- C. 75U/L

2. High LH, low FSH indicates which of the following?

- A. PCOS
- B. Ovarian failure
- C. Hyperprolactinaemia

3. Low Testosterone, high Gonadotrophins levels indicates which of the following?

- A. Hypogonadotrophic hypogonadism
- B. Hyperprolactinaemia
- C. Primary testicular failure

4. Which of the following confirms the occurrence of ovulation?

- A. serum [progesterone] measured in the middle of the luteal phase (day 21) is <10nmol/L
- B. serum [progesterone] measured in the middle of the luteal phase (day 21) is >30nmol/L

5. which of the following drugs can cause hyperprolactinaemia?

- A. phenothiazines
- B. metoclopramide
- C. α -methyl dopa
- D. All of the above

6. Which of the following inhibits prolactin release?

- A. Dopamine
- B. Serotonin
- C. Inhibin

7. What is the early sign of hyperprolactinemia In women?

- A. Amenorrhoea
- B. Galactorrhoea
- C. All of the above

8. Infertility is failure of a couple to conceive after of regular, unprotected intercourse:

- A. 3 months
- B. 1 year
- C. 2 years

9. The sperm analysis of a 34-year old male has revealed an abnormal sperm count. Testosterone and gonadotropin levels were measured on further tests and the results are shown below. What is the diagnosis

Parameter	Result	Normal
Tetosterone	90 ng/dl	270 -1070 ng/dL
FSH	0.6 U/ml	1.5 - 12.4 mIU/ml
LH	1.0 U/ml	1.8 to 8.6 IU/L.

A- Primary testicular failure.

B- Hypogonadotrophic hypogonadism

C- Cushing's syndrome.

ANSWERS: 1) B 2) A 3) C 4) B 5) D 6) A 7) C 8) B 9) B

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