Pituitary gland
Adrenal gland

Endocrinology

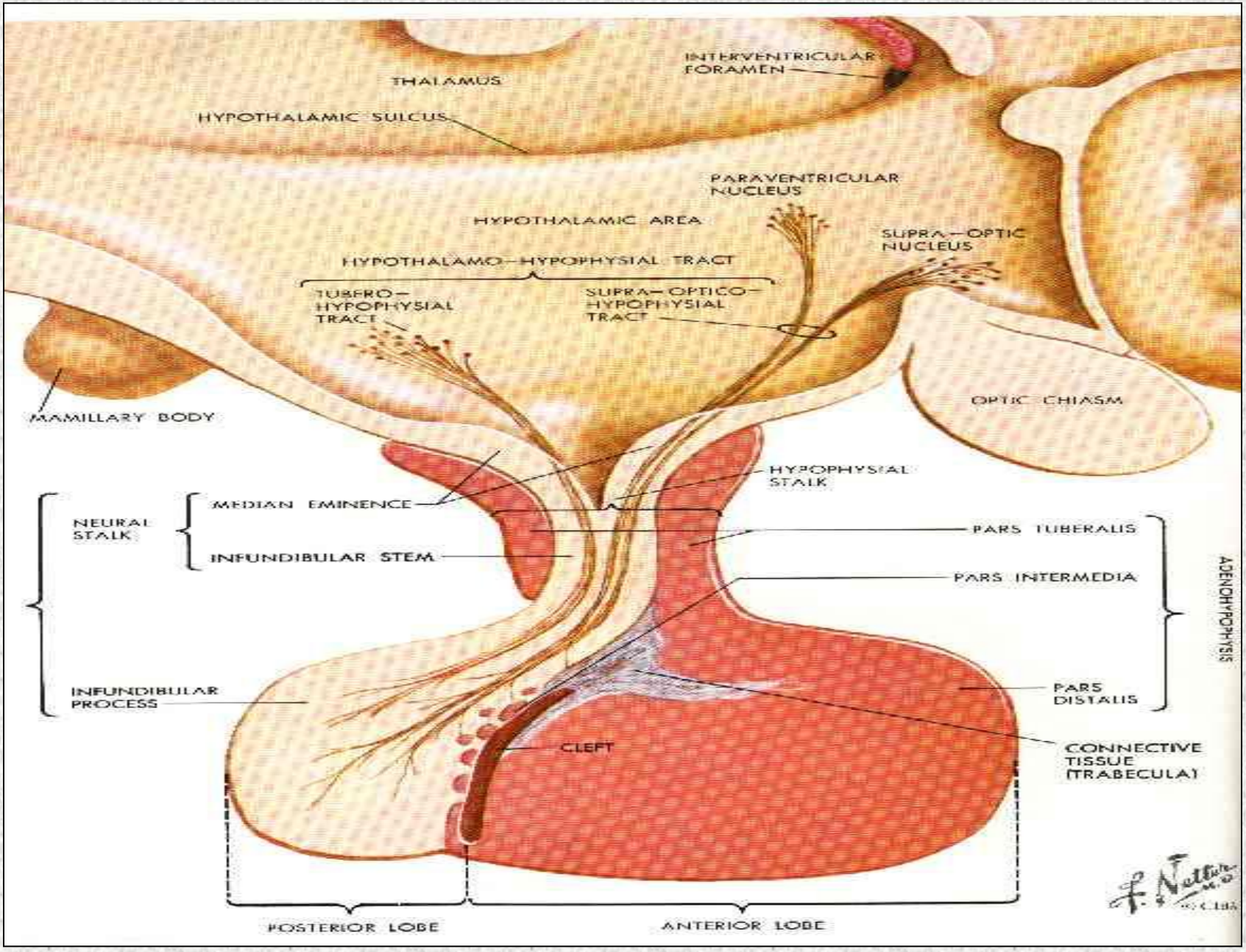
Hypophysis

The pituitary is located under the brain in the sella turcica-hypophyseal fossa of the skull. It is protected by the sphenoid bone wich surrounds it laterally and inferiorly. It is covered by the diafragma sellae

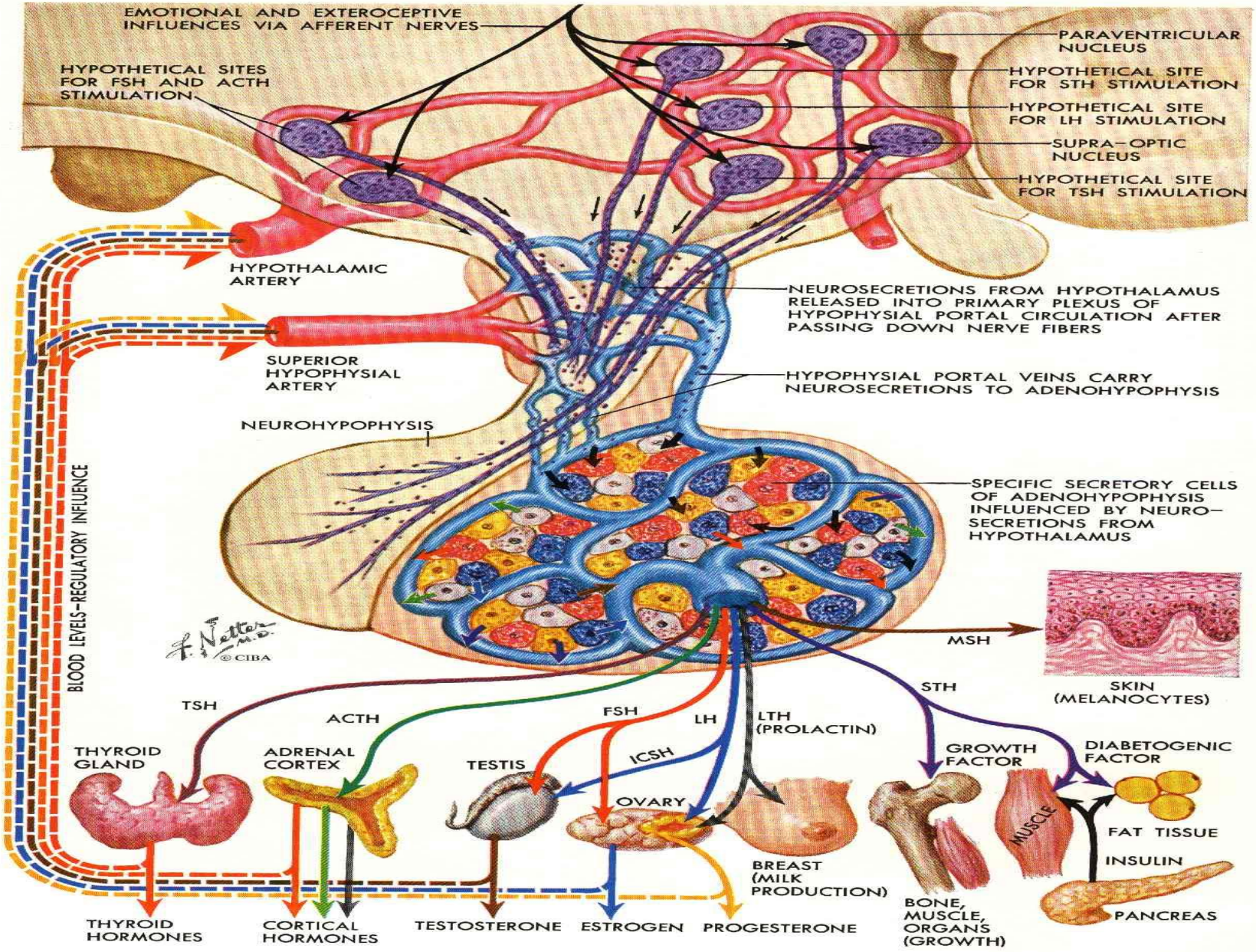
Is formed by two lobes producing a variety of vital hormones

Anterior lobe Adenohypophysis

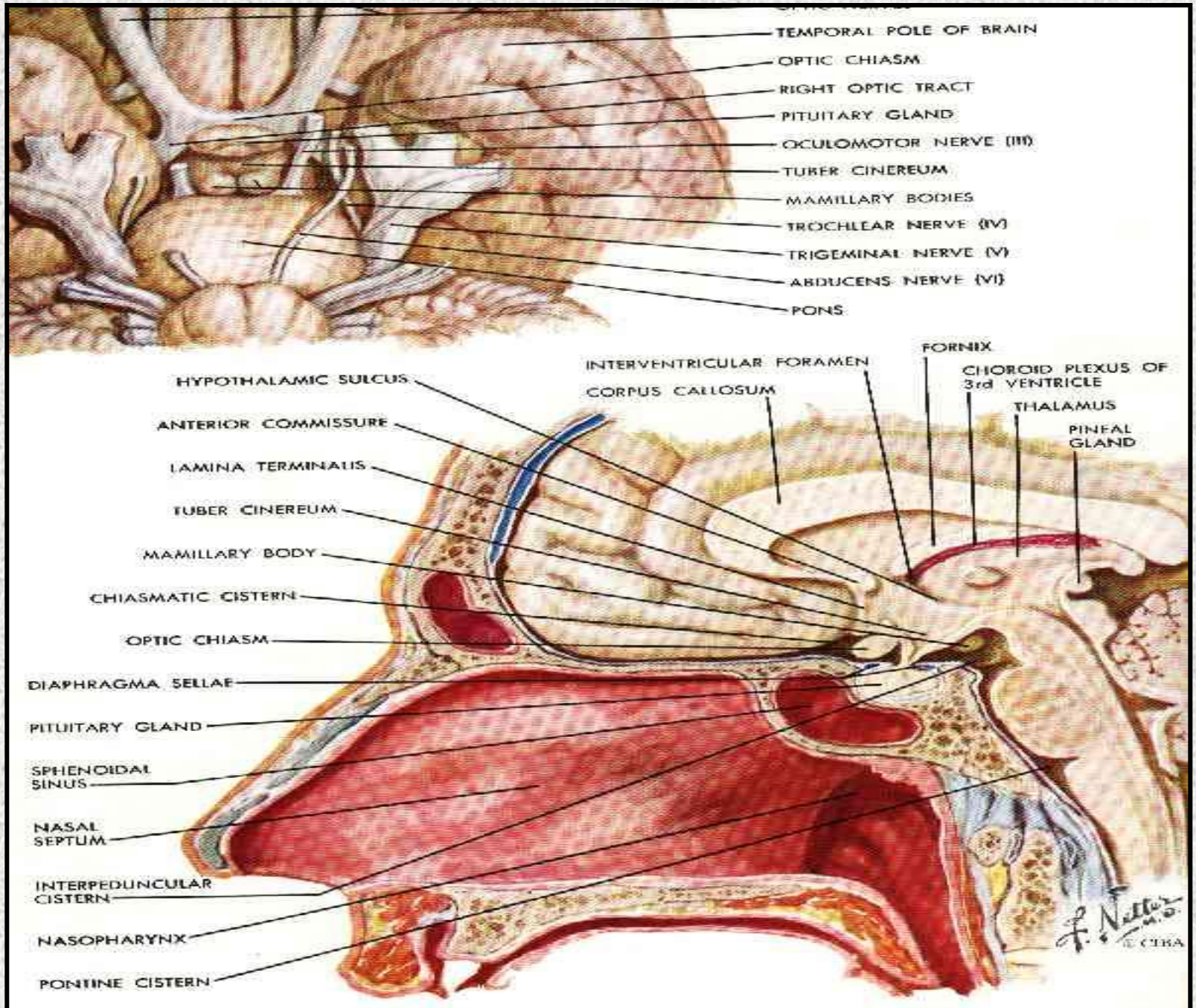
Posterior lobe Neurohypophysis


INTERVENTRICULAR FORAMEN
THALAMUS
HYPOTHALAMIC SULCUS
PARAVENTRICULAR NUCLEUS
HYPOTHALAMIC AREA
SUPRA-OPTIC NUCLEUS
HYPOTHALAMO-HYPOPHYSIAL TRACT
TUBERO-HYPOPHYSIAL TRACT
SUPRA-OPTICO-HYPOPHYSIAL TRACT
MAMILLARY BODY
OPTIC CHIASM
HYPOPHYSIAL STALK
NEURAL STALK
MEDIAN EMINENCE
INFUNDIBULAR STEM
PARS TUBERALIS
PARS INTERMEDIA
ADENOHYPOPHYSIS
INFUNDIBULAR PROCESS
PARS DISTALIS
CLEFT
CONNECTIVE TISSUE (TRABECULA)
POSTERIOR LOBE
ANTERIOR LOBE

Hypophysial portal circulatinon , Neurosecretion, Portal veins trasport



Hypophysis


TEMPORAL POLE OF BRAIN
OPTIC CHIASM
RIGHT OPTIC TRACT
PITUITARY GLAND
OCULOMOTOR NERVE (III)
TUBER CINEREUM
MAMILLARY BODIES
TROCHLEAR NERVE (IV)
TRIGEMINAL NERVE (V)
ABDUCENS NERVE (VI)
PONS
INTERVENTRICULAR FORAMEN
FORNIX
CHOROID PLEXUS OF 3rd VENTRICLE
CORPUS CALLOSUM
THALAMUS
PINEAL GLAND
HYPOTHALAMIC SULCUS
ANTERIOR COMMISSURE
LAMINA TERMINALIS
TUBER CINEREUM
MAMILLARY BODY
CHIASMATIC CISTERN
OPTIC CHIASM
DIAPHRAGMA SELLAE
PITUITARY GLAND
SPHENOIDAL SINUS
NASAL SEPTUM
INTERPEDUNCULAR CISTERN
NASOPHARYNX
PONTINE CISTERN

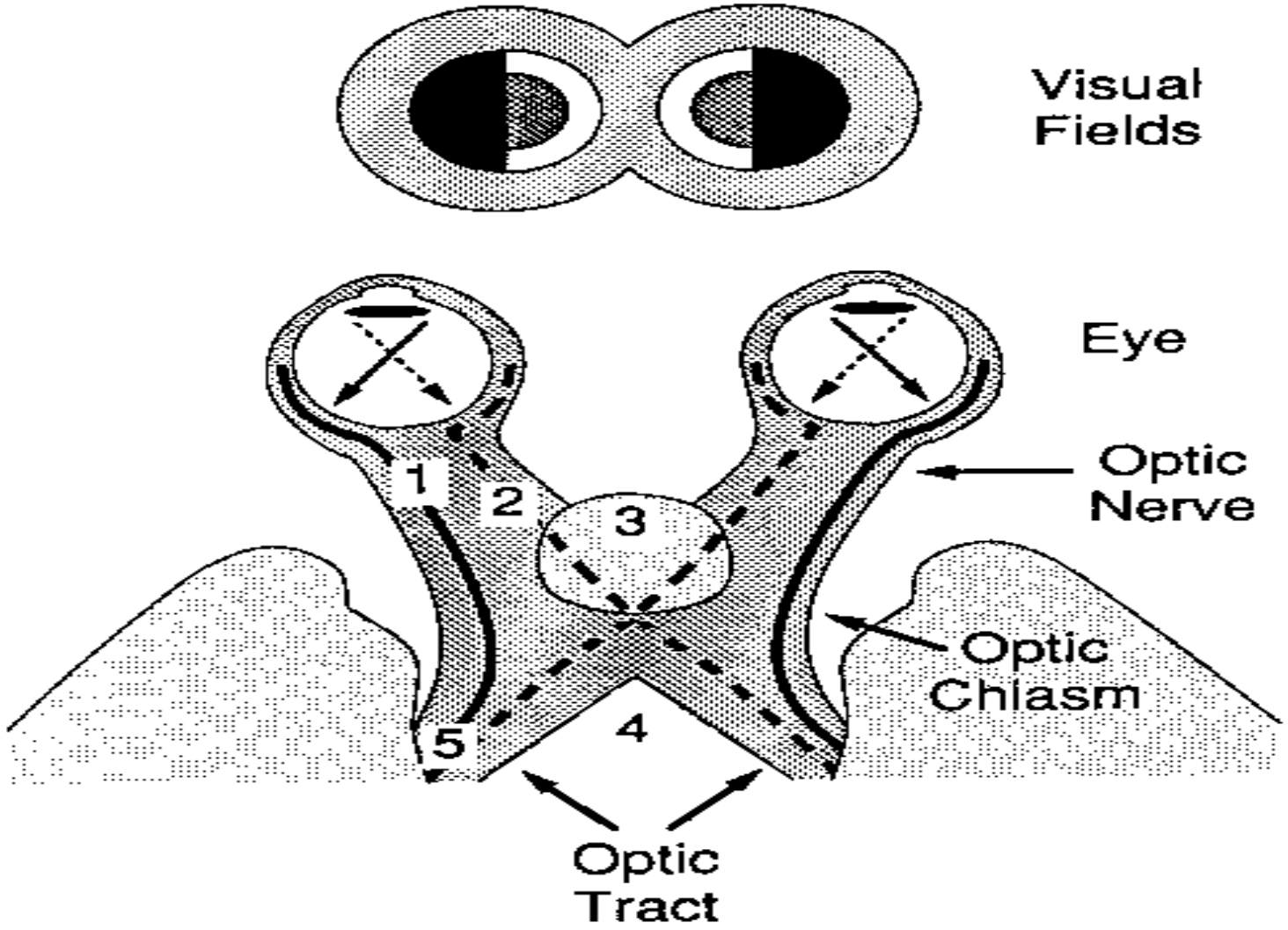


Figure 9–29. The most common visual field defect, bitemporal hemianopia (black areas of visual fields) is caused by compression of the posterior aspect of the chiasm (4) from below. Visual disturbances resulting from compression of the optic nerves, chiasm, and tracts are listed below. The site of lesion is indicated by number.

Pattern	Visual Field/Acuity	Anatomic Correlate

Adenohypophysis

anterior lobe is responsible for the production of :

1. STH (GH) somatotropic or growth hormone
2. ACTH adrenocorticotropic hormone
3. TSH thyrotropic hormone
4. FSH follicle-stimulating
5. LH luteinaising hormone
6. PRL prolactin, luteotropic hormone or lactogenic hormone

Neurohypophysis

posterior lobe is responsible for the sekretion of :

1. ADH antidiuretic hormone, vasopresin
2. Oxytocin

The two hormones are realy built in the hypothalamus. In the neurohypophysis they are only stored and secreted into the blood stream

Adrenocorticotropic Hormone (ACTH)

ACTH stimulates adrenal glands

An exces of hormone causes **Cushing´s Deasese**

Luck of hormone causes **Addison´s Desease**

Adrenal glands

Adrenal cortex

hydrocortison - vital corticosteroid regulate carbohydrates metabolism

aldosteroun - mineralocorticoid regulate mineral metabolism (salt , potassiem , and so water balnace , blood presure)

adrenal androgens – they are not vital steriods

Adrenal medulla part of sympathetic nervous system

adrenalin, nordrenalin acting as vasoconstrictors and cardiac stimulants

Thyroid Stimulating Hormone

- Thyreotropic hormone (TSH) regulates the functional activity of the thyroid gland, it induce thyroid hormon syntehsis and release

- TSH oversecretion induce leds to **central hyperthyroidism** , it is caused by very rare TSH producting pituitary tumors, it represent less than 1% pituitary tumors
- Luck of TSH **- Central hypothyroidism**

Hypothyreosa

Thyreotoxicosis

http://medpedia.framar.bg

Somatotropic Hormone (STH,GH)

Is responsible for growth

Lack of GH in childhood causes **Pituitary dwarfism** or **arrested grows**

An excess of GH in childhood causess **Gigantism**

An excess of GH in adults causess **Acromegaly**

4.Folicle Stimulating Hormone

Control developement of ovarian follicles and spermatogenesis in the testes

5.Luteinizing Hormone (LH)

In conjunction with FSH induces the secretion of oestrogens, ovulation and corpus luteium production in females and that of testosterone in males.

6.Prolactine (PRL)

- Luteotropic hormone is lactogenic hormone - induces the secretion of milk in the fully developed mammary gland

An excess of PRL – hyperprolactinemia caused by prolactinoma

Prolactinom

galactorea,amenorhea, menstrual irregularitis, decrease or loss of libido- sexual dysfunction, it is causess by prolactin secreting adenomas **Prolactinoma**

- Galactorea – 50% women, 35% man
- Mikro and makroadenomas (10mm)

Prolactinoma - Treatment

Medical management – **DOPAMIN AGONIST**

normalization PRL level and reversal tumor mass

- **tergurid** – Mysalfon, dopamin agonist
- **bromocryptine** –Parlodel , semisynthetic ergot alkaloid, it is dopamin agonist
- **quinagolide** – Norprolac, nonergot dopamin agonist
- **cabergolin** – Dostinex 0,5mg tbo , dopamin agonist, has longer duration of action (administrated twice weekly)

Prolactinoma - Treatment

- **Radiotion Therapy** – linear accelerator radiotherapy is effective in controlling or reducting the size of prolactinomas , but it takes years to achive maximal efekt

  Side efekt , pituitary faillure, brain atrophy

- **Stereotactic Radiosurgery** non-surgical precisely-targeted radiation small tumors, preserve healthy tissue
- **Surgery** no very efektiv , relapsing

Cushing´s desease – central hypercortisolism

Adrenal overstimulation by ACTH due to a pituitatry adenoma induced adrenal steroidogenesis of **cortisol** , and although aldosteron and androgens

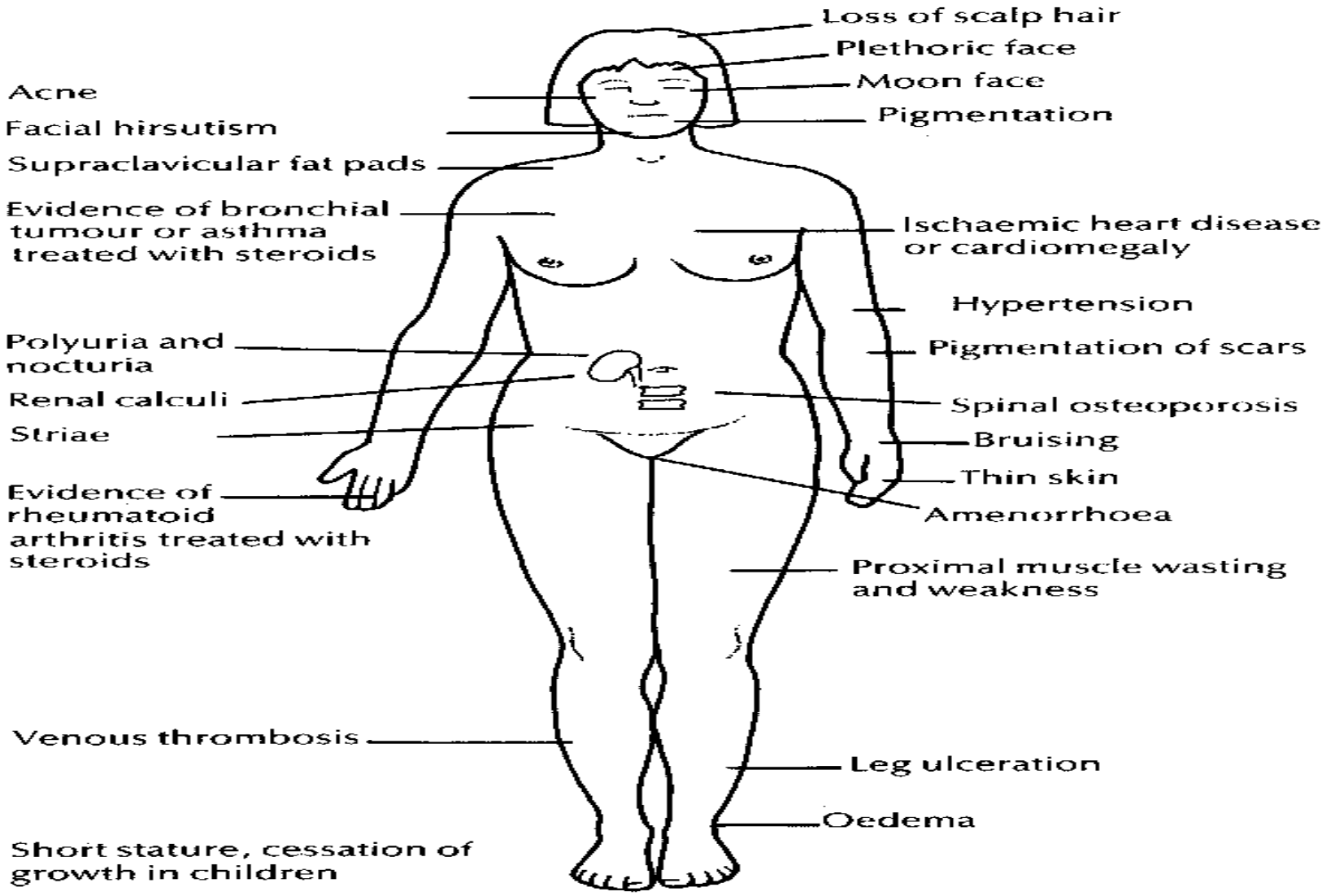
Cushing's syndrome is a collection of signs and symptoms due to prolonged exposure to cortisol. -excessive cortisol-like medication such as prednison or tumor production of cortisol

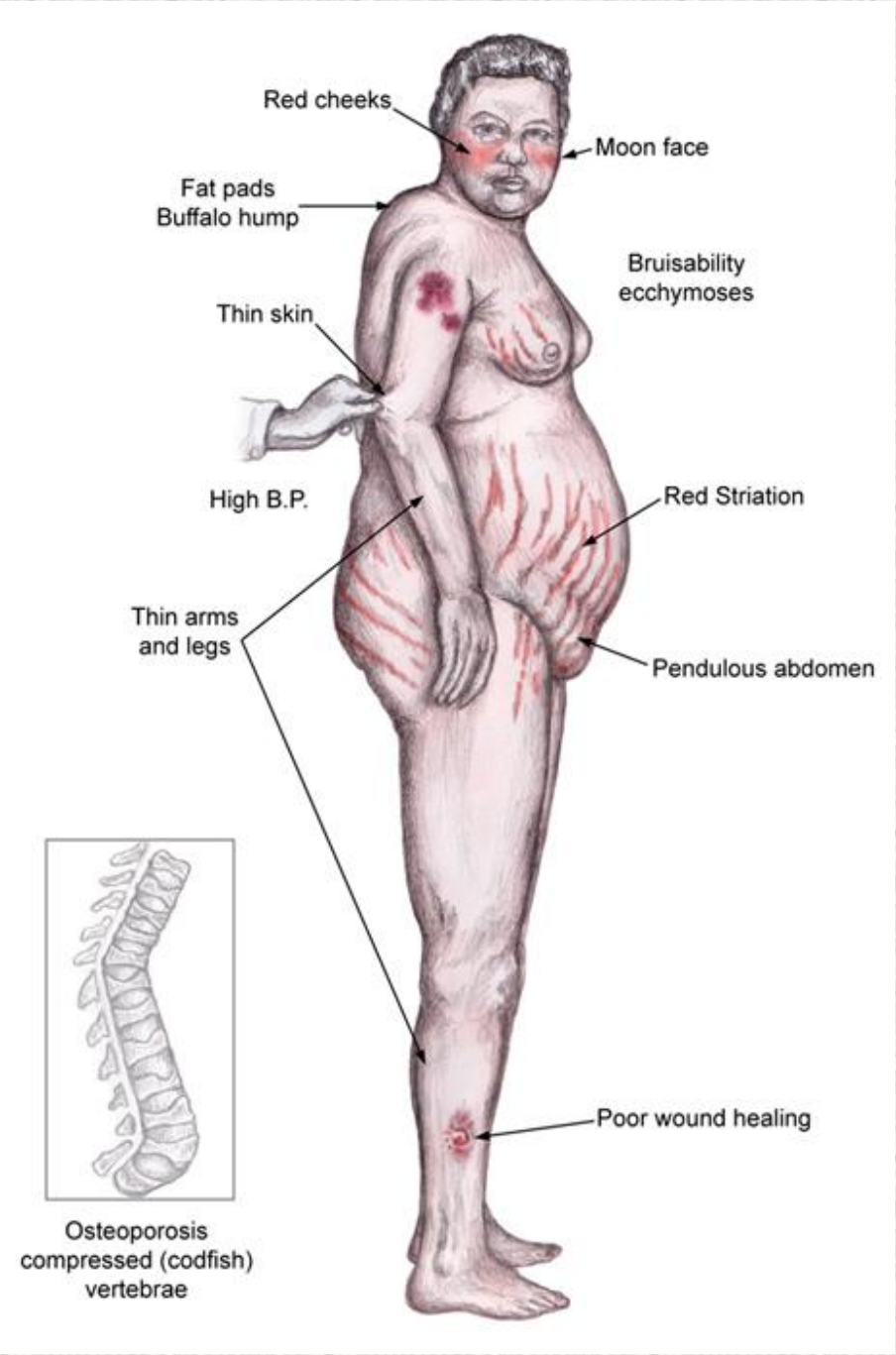
TABLE 12–15. Signs and Symptoms of Cushing's Syndrome

Sign or Symptom	Reported Incidence (%)
Centripetal obesity	79–97
Facial plethora	50–94
Glucose intolerance	39–90
Weakness, proximal myopathy	29–90
Hypertension	74–87
Psychological changes	31–86
Easy bruisability	23–84
Hirsutism	64–81
Oligomenorrhea or amenorrhea	55–80
Impotence	55–80
Acne, oily skin	26–80
Abdominal striae	51–71
Ankle edema	28–60
Backache, vertebral collapse, fracture	40–50
Polydipsia, polyuria	25–44
Renal calculi	15–19
Hyperpigmentation	4–16
Headache	0–47
Exophthalmos	0–33
Tinea versicolor infection	0–30
Abdominal pain	0–21

Adapted from a table in Howlett TA, Rees LH, Besser GM. Cushing's syndrome. Clin Endocrinol Metab 1985; 14:911–945. Copyright 1985, The Endocrine Society. Data summarized from Cushing,[1293] Plotz et al.,[1299] Ross et al.,[1301] Gold,[1194] Jeffcoate et al.,[926] Cohen,[927] Liddle,[1512] Urbanic and George,[1406] and Ross and Linch.[1297]

Cushing's syndrome





http://img.medscape.com/pi/emed/ckb/endocrinology/116364-138556-117365-138806.jpg

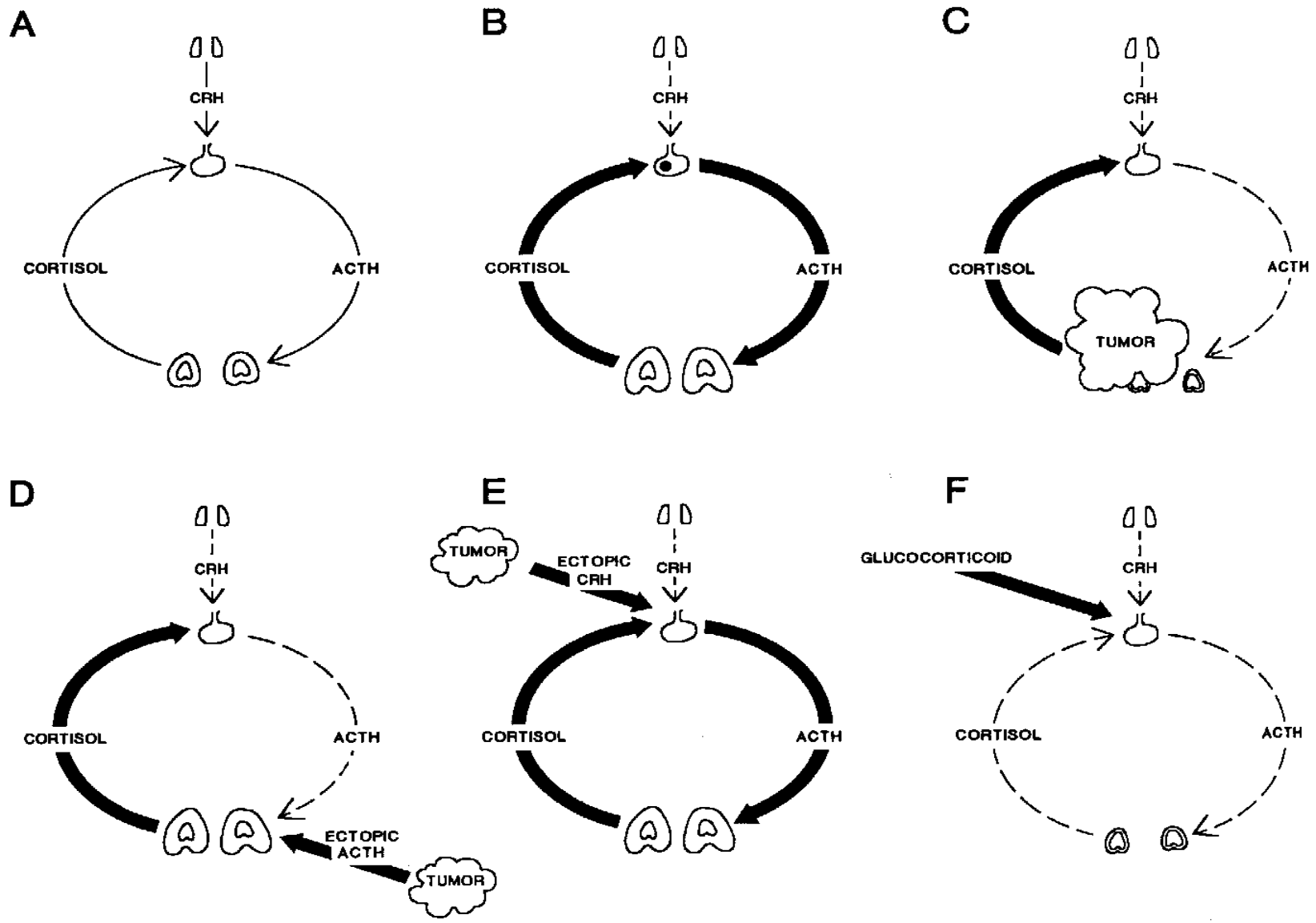


Figure 12–38. Hypothalamic-pituitary-adrenal function in normal individuals *(A)* and the pathophysiologic aberrations in pituitary ACTH-dependent Cushing's disease *(B)*, primary adrenocortical disease (i.e., cortisol-secreting adrenal tumor, bilateral micronodular dysplasia, and bilateral ACTH-independent macronodular hyperplasia) *(C)*, ectopic ACTH syndrome *(D)*, ectopic CRH syndrome *(E)*, and iatrogenic Cushing's syndrome caused by pharmacologic dosage of glucocorticoids *(F)*.

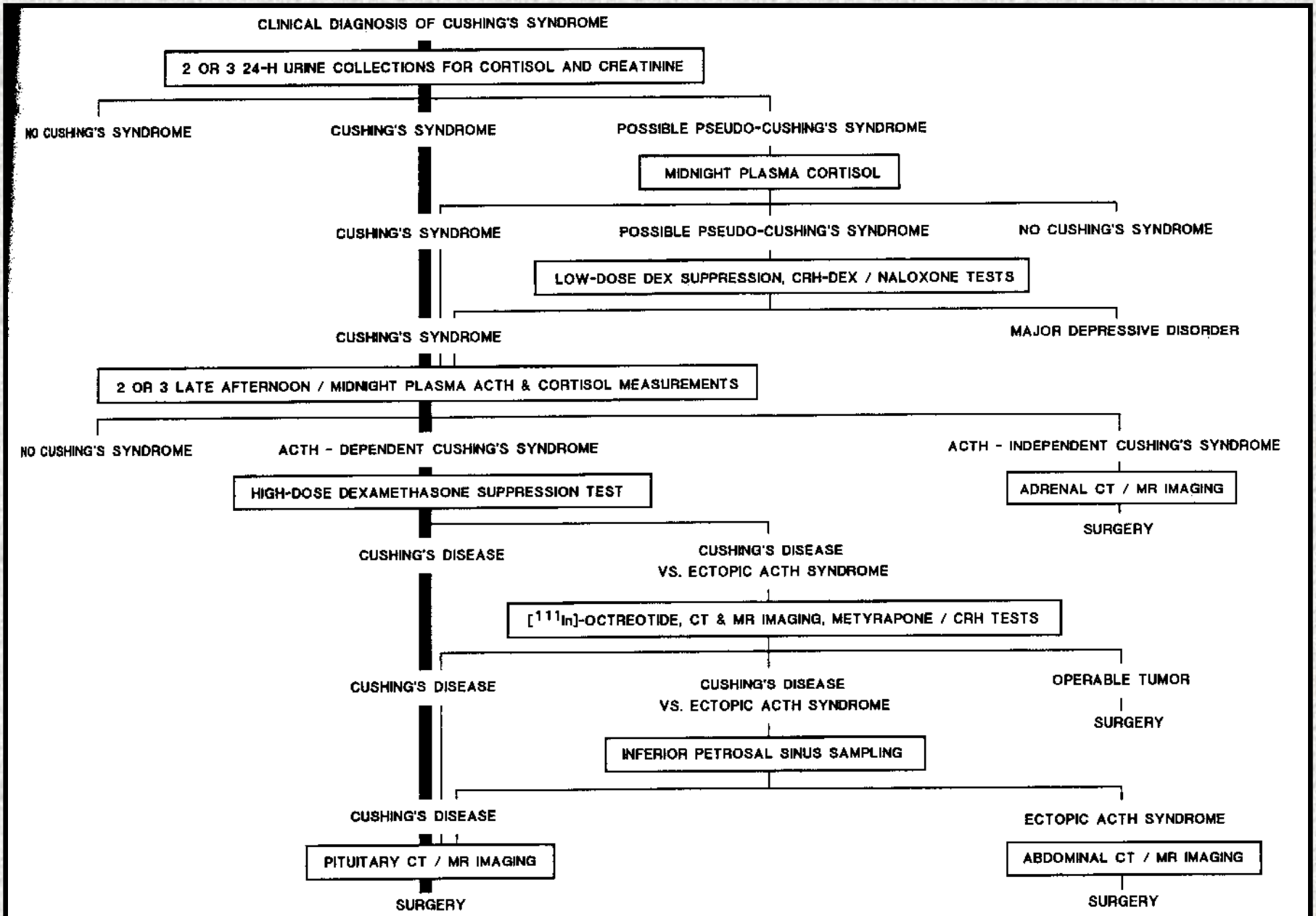


Figure 12-45. A diagnostic laboratory approach to confirming the existence of Cushing's syndrome and determining its cause.

Cushing´s sy therapy

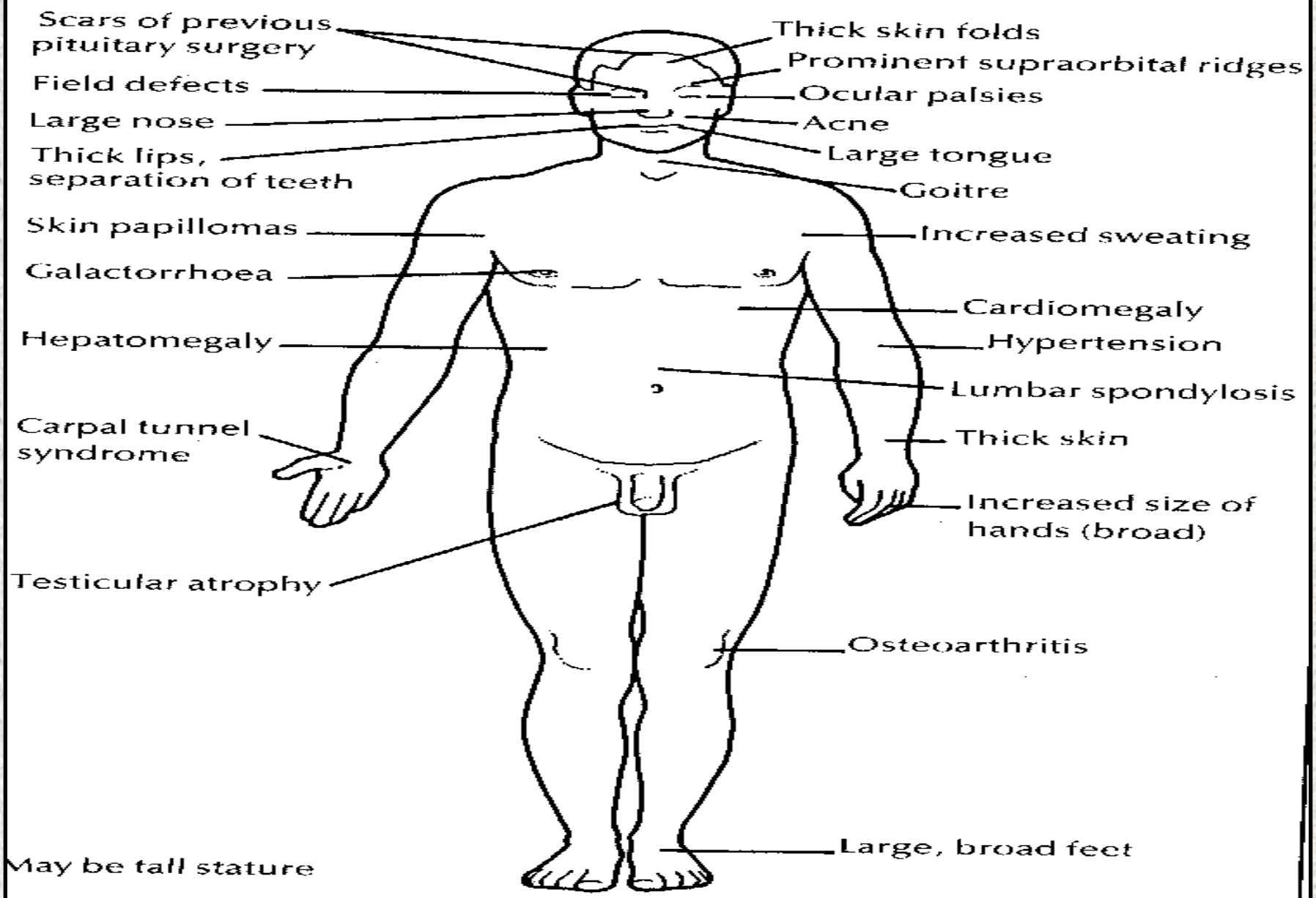
Pituitary dependent (central)cushing´s sy

- **Transphenoidal surgery**
- **Transcranial surgery**
- **Radiotherapy** (not recomended as a primary treatment)
- **Stereotactic Radiosurgery** non-surgical precisely-targeted radiation small tumors, preserve healthy tissue
- **Medical treatment** – metyrapon, aminogluthetimid, ketoconazol/kabergolin, mitotan (adrenolitic agent), pasireotide somatostatin analog5-Signifor

Acromegaly

Gowth hormon exces acting

Acromegaly


Scars of previous pituitary surgery
Field defects
Large nose
Thick lips, separation of teeth
Skin papillomas
Galactorrhoea
Hepatomegaly
Carpal tunnel syndrome
Testicular atrophy
May be tall stature
Thick skin folds
Prominent supraorbital ridges
Ocular palsies
Acne
Large tongue
Goitre
Increased sweating
Cardiomegaly
Hypertension
Lumbar spondylosis
Thick skin
Increased size of hands (broad)
Osteoarthritis
Large, broad feet

Acromegaly

Acromegaly

Acromegaly

Acromegaly

Acromegaly

Acromegaly Therapy

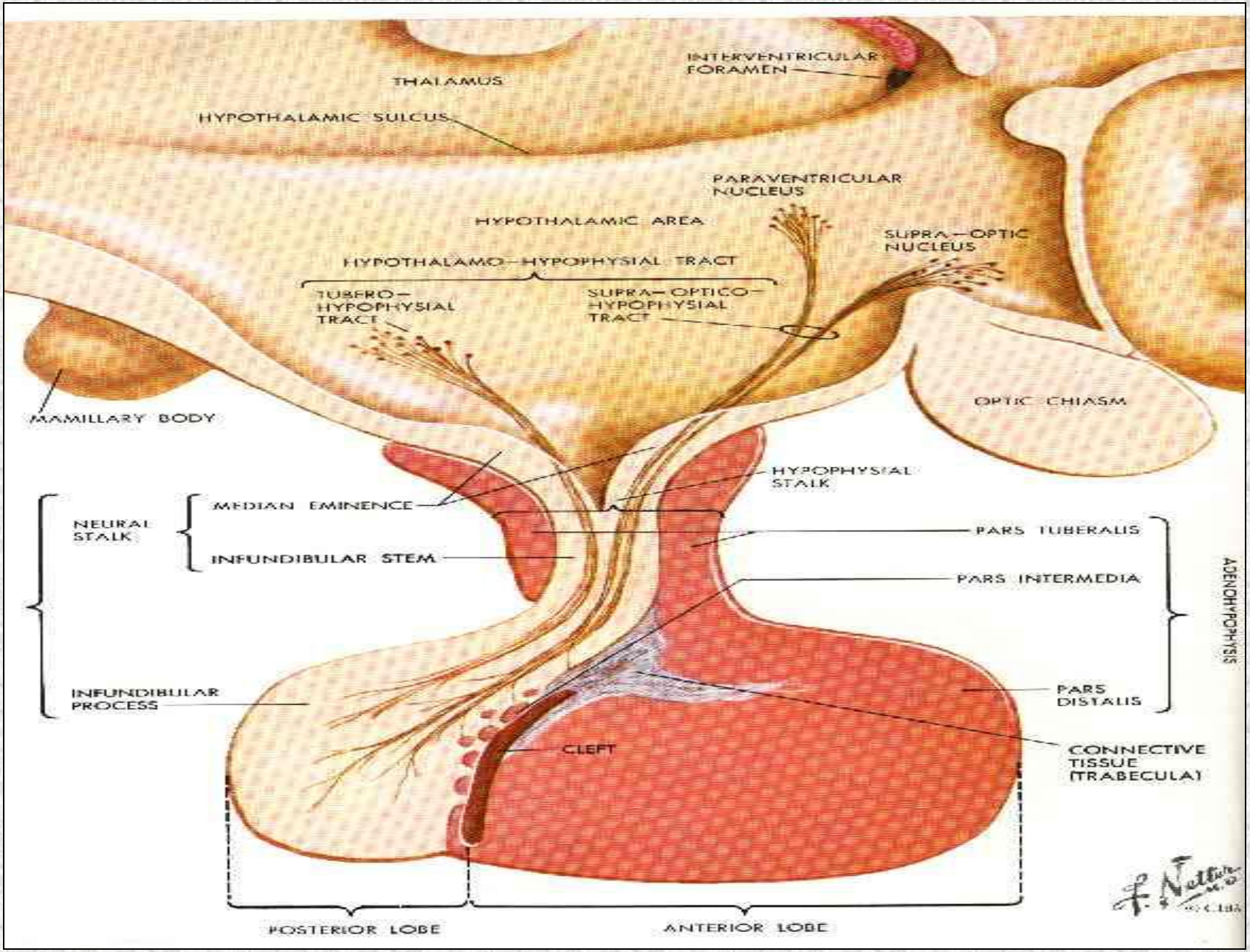
- **Surgical** management –transpenoidal,transcranial
- Stereotactic pituitary tumor ablation by **Gama knife**
- **Radiation** – is higly idnividual choise depending on the experience
- **Dopamin agonists** (Bromocriptin, Cabergolin)
- **Somatostatin analogs** somatostatin release inhibiting factor receptor (Octreotid , Lanreotid)
- **Growth hormone receptor antagonist** (Pegvisomat)

Neurohypophysis

posterior lobe is responsible for the sekretion of :

1. ADH antidiuretic hormone, vasopresin
2. Oxytocin

The two hormones are realy built in the hypothalamus. In the neurohypophysis they are only stored and secreted into the blood stream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MAMILLARY BODY
OPTIC CHIASM
HYPOPHYSIAL STALK
NEURAL STALK
MEDIAN EMINENCE
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PARS TUBERALIS
PARS INTERMEDIA
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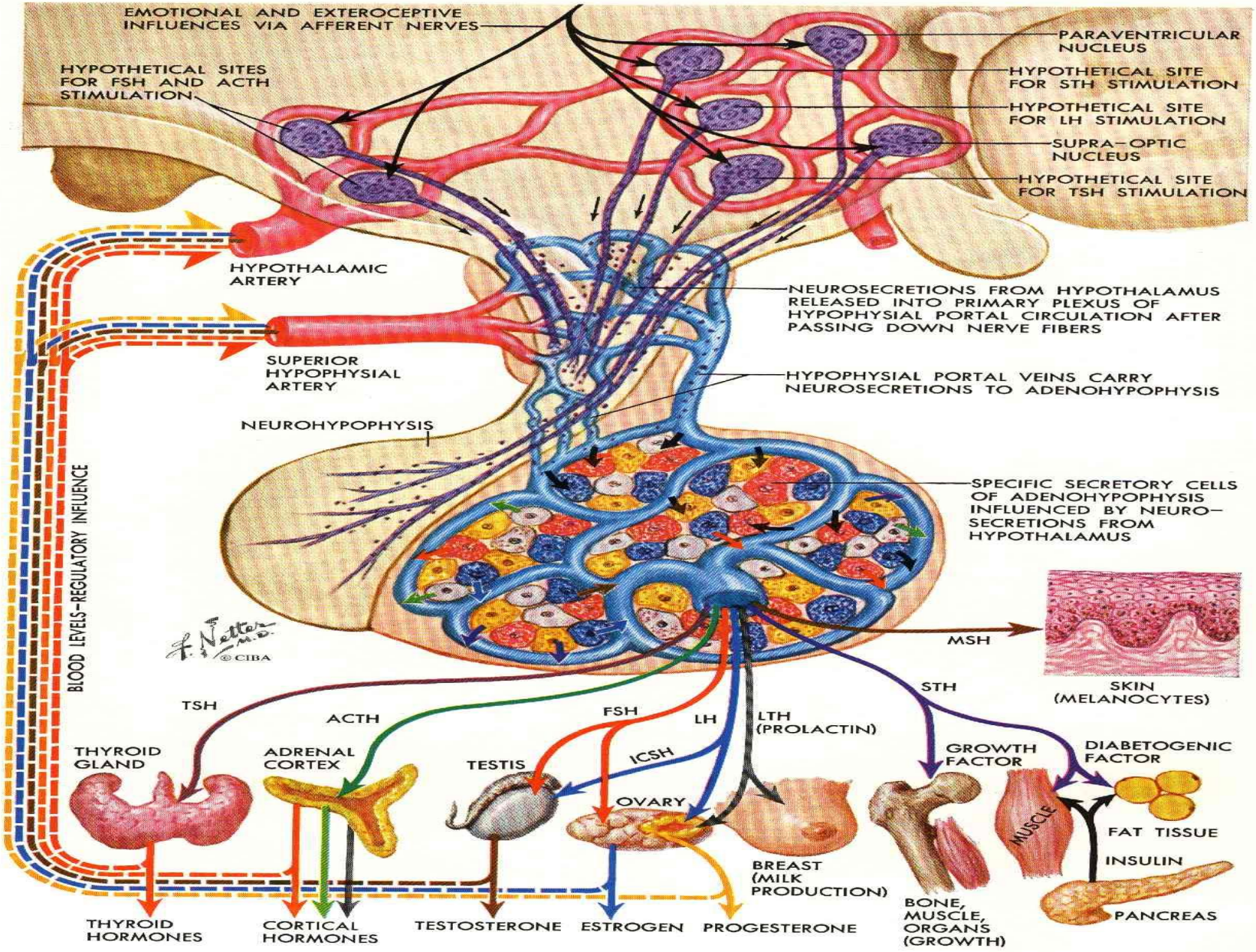
POSTERIOR LOBE
ANTERIOR LOBE

Hypophysial portal circulatinon , Neurosecretion, Portal veins trasport



Antidiuretic hormone (ADH)

ADH preventing excessive loss of water in the urine, thus causes water to be retained by the kidneys

- Luck of ADH causes **Diabetes insipidus**

It has aditional property of causing the blood presure to rise. So it has alternative name **Vasopresin**

Oxytocin

Oxytocin acts on the smooth muscle of the uterus at the end of pregnancy.

It initiates labour and promotes lactation

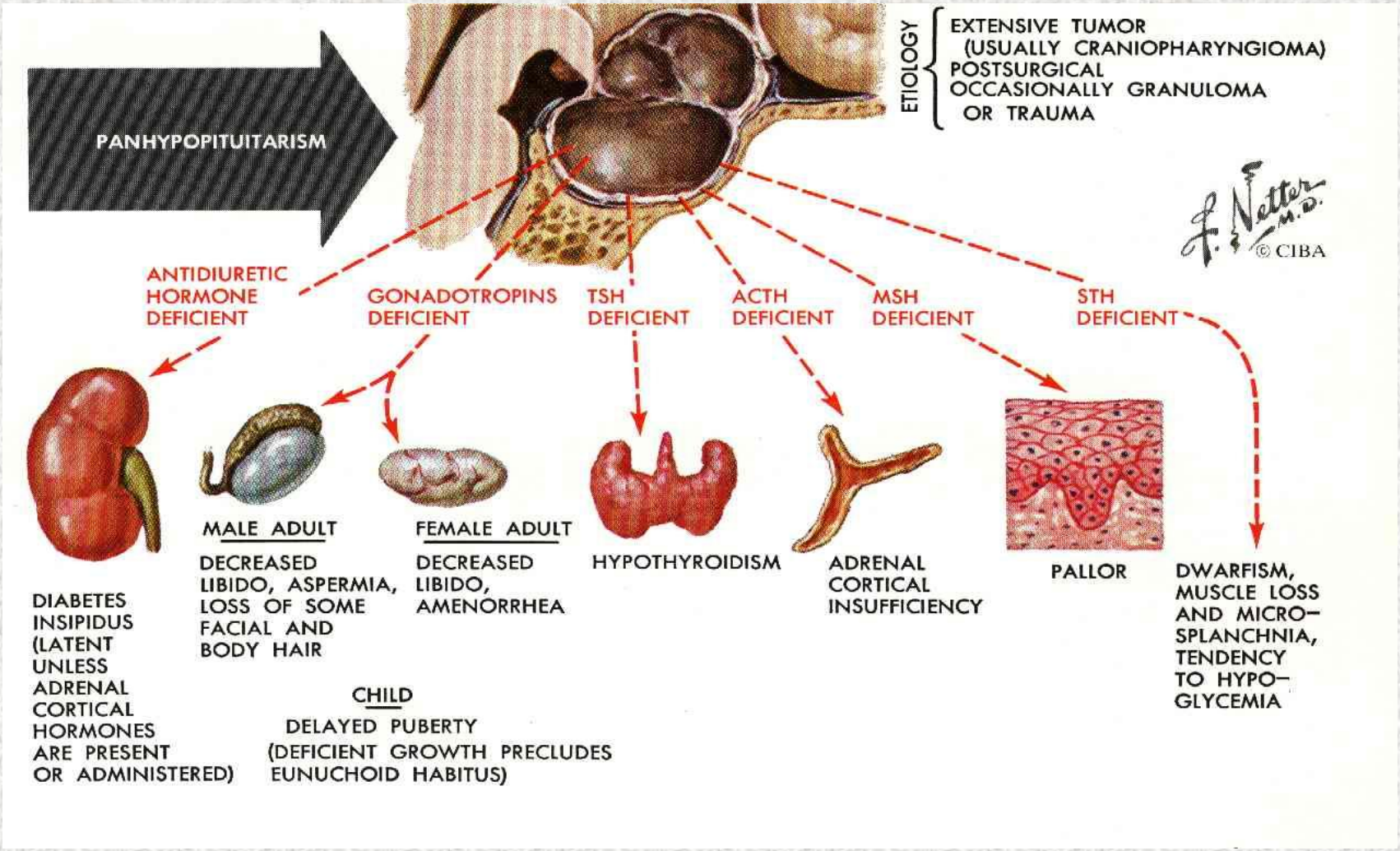
The sellar patology

Nonsecretory adenoma
Nonpituitary sellar mass

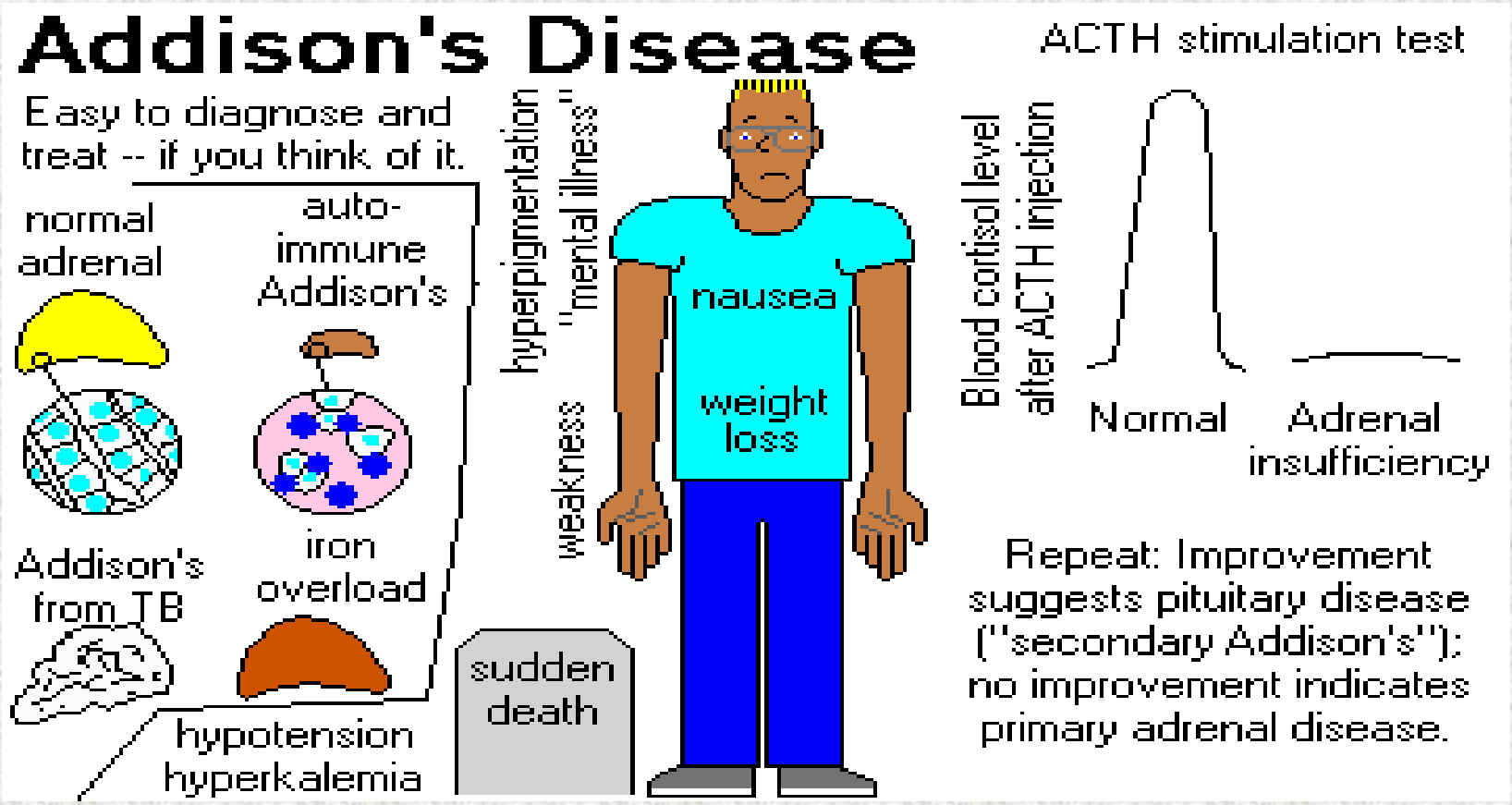
Craniopharingioma, Menngeioma, Granulomatosis lymf ,Sarkoidosis

Hypophysitis
Empty sella
Pituitary apoplexy (Shihan´s sy)
Nelson´s syndrom

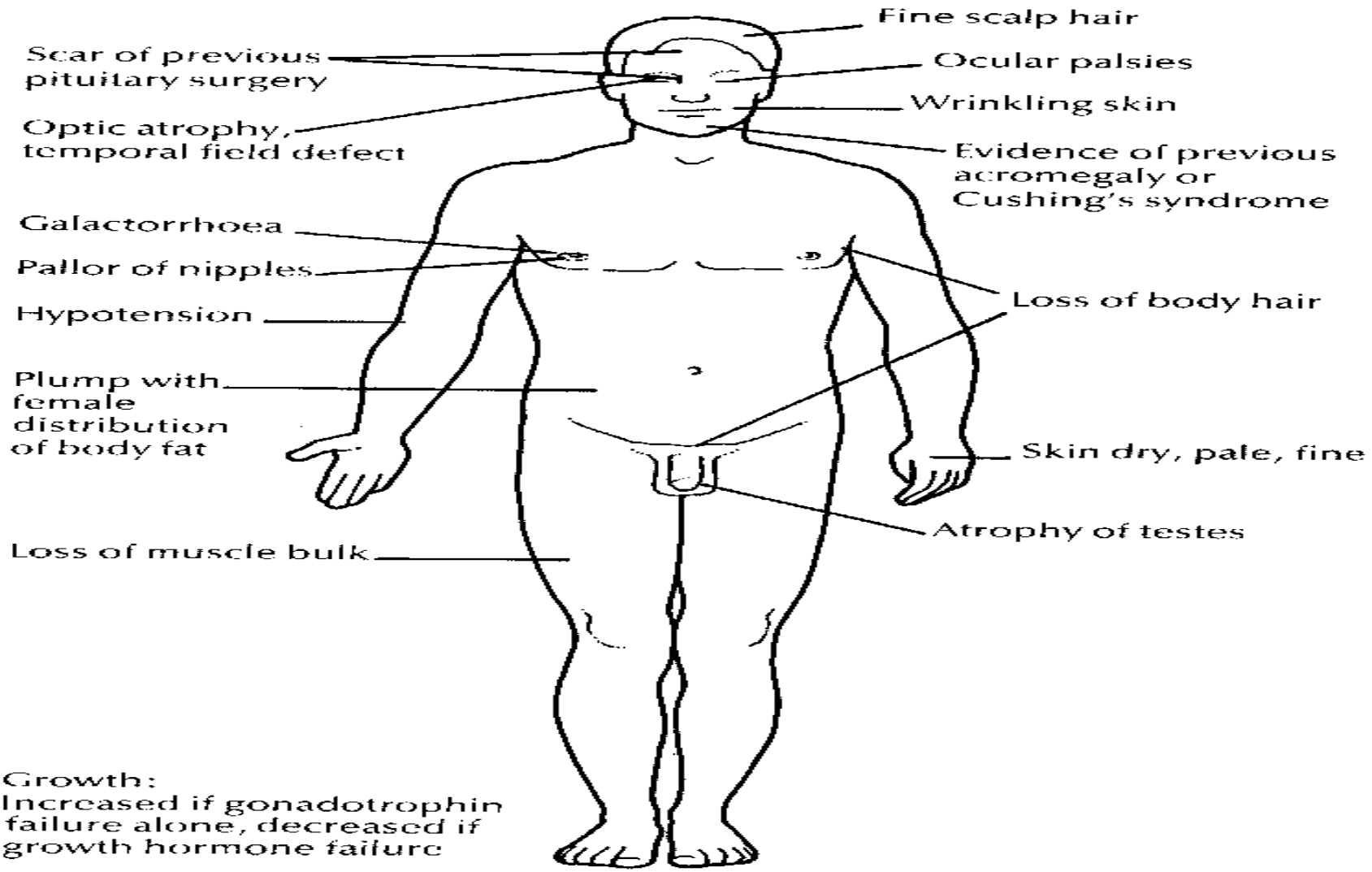
Pituitary failure picture



Adrenal failure

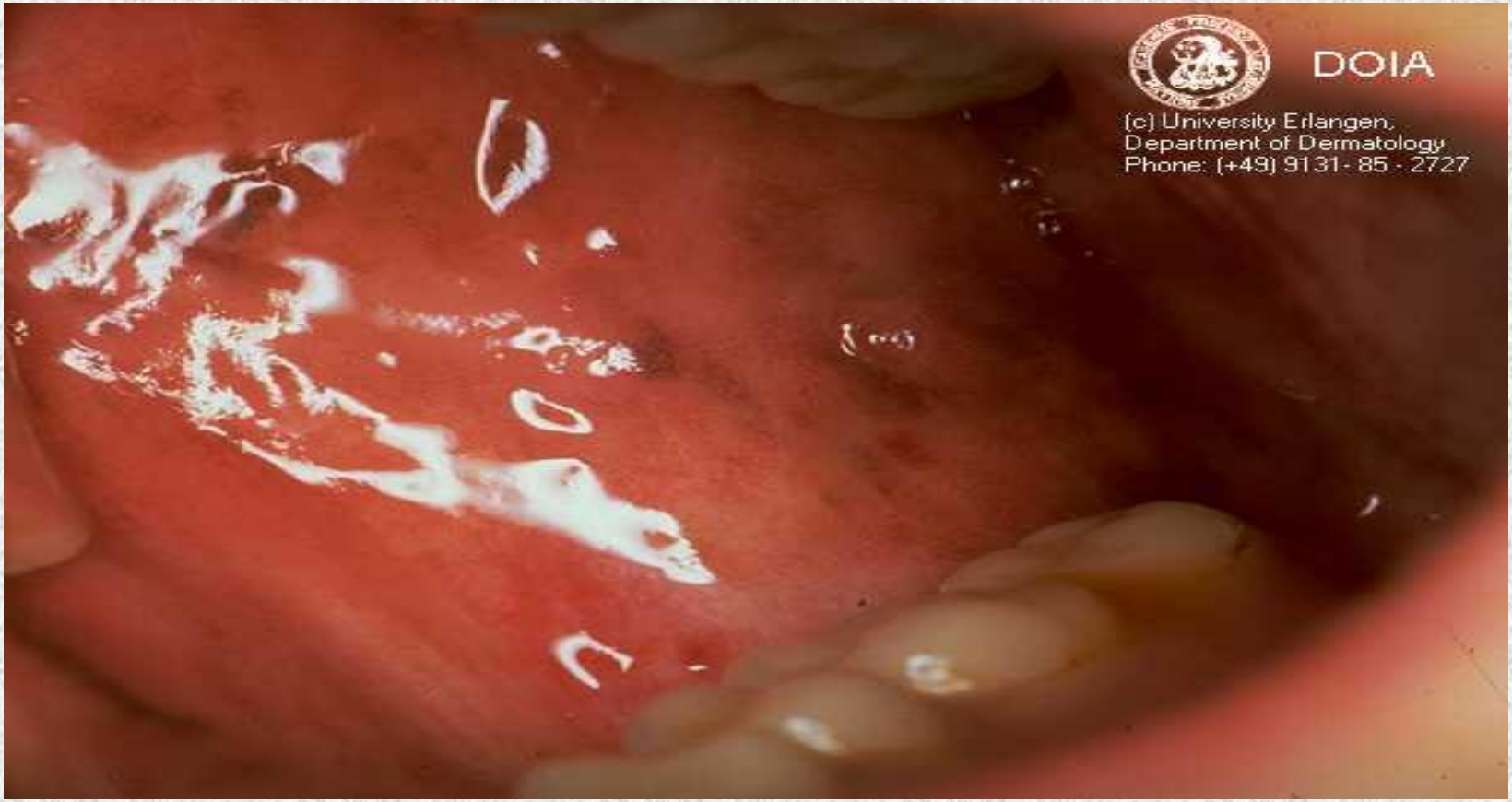


Pituitary failure



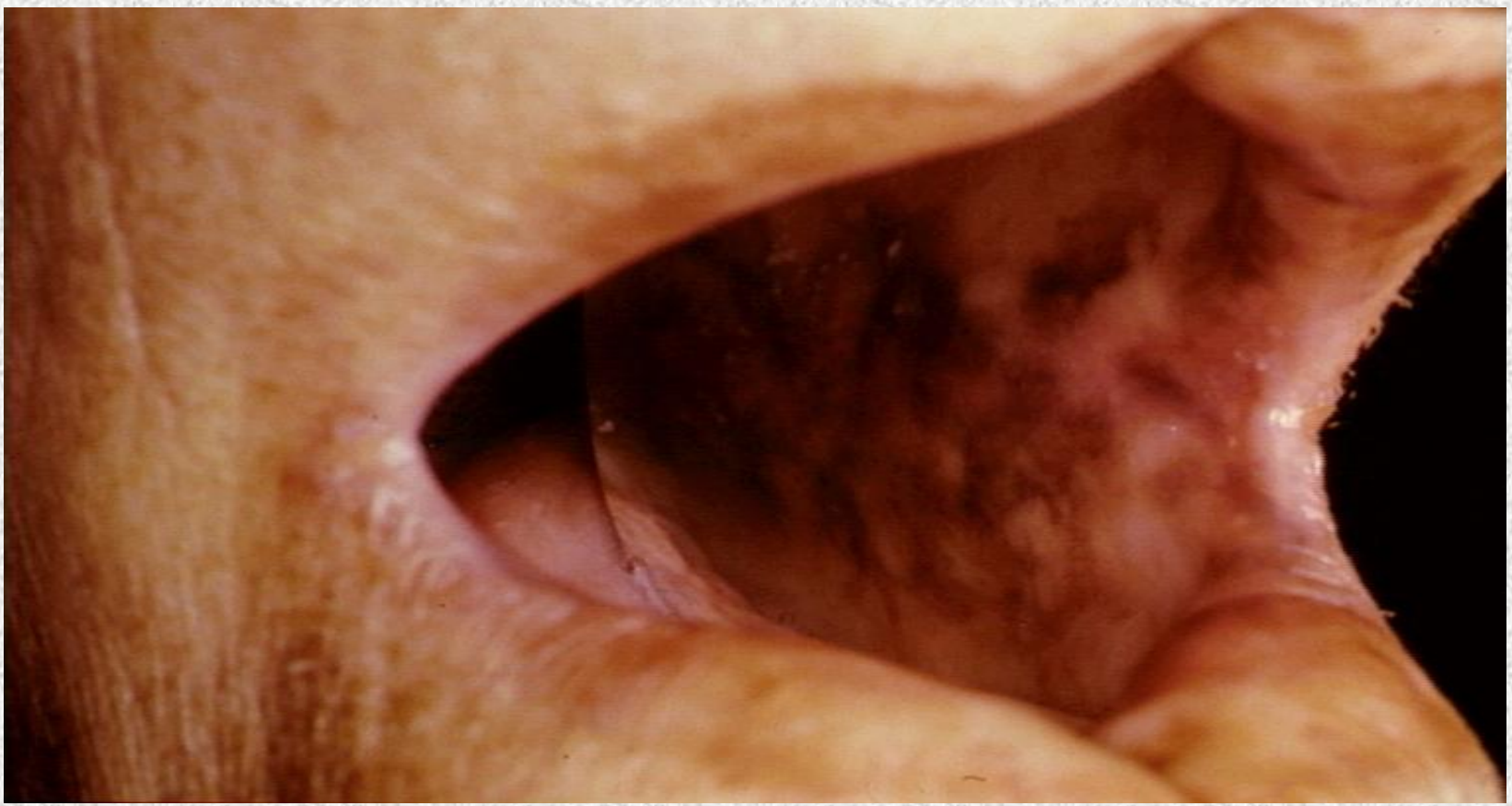
APS 1.,2.- hyperpigmentace , addisonova choroba

APS 1.,2.- grafitové skvrny



APS 1.,2.-addisonova choroba

APS 1.,2. – addisonova choroba



APS 1.,2. - hyperpigmentace

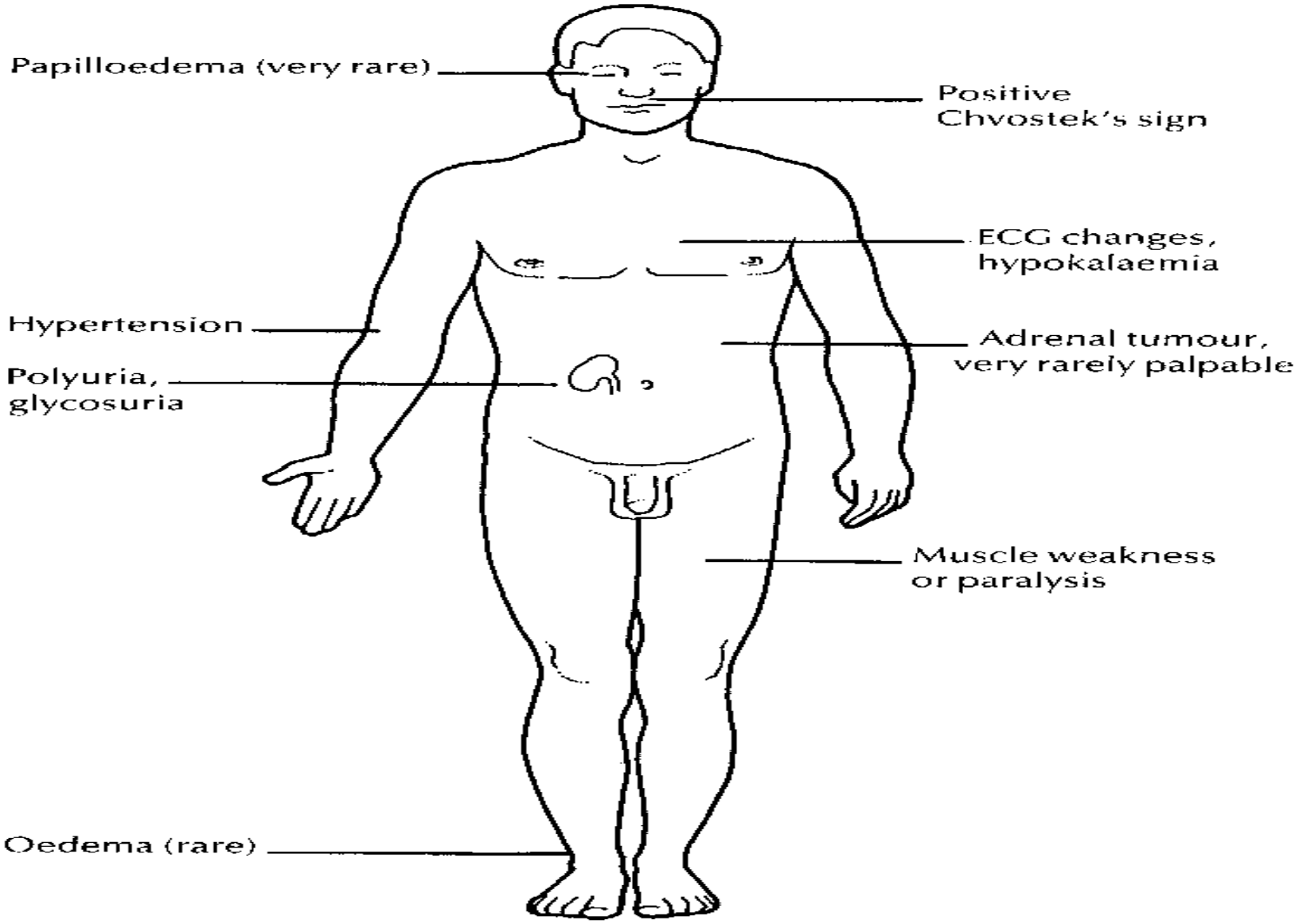
Primary hyperaldosteronism

- Adrenal cortex adednoma producting aldosteron

Terapie : Spironolakton

Surgery - adrenalectomia

Primary aldosteronism



Pheochromocytoma

Adrenal medulla tumor producting

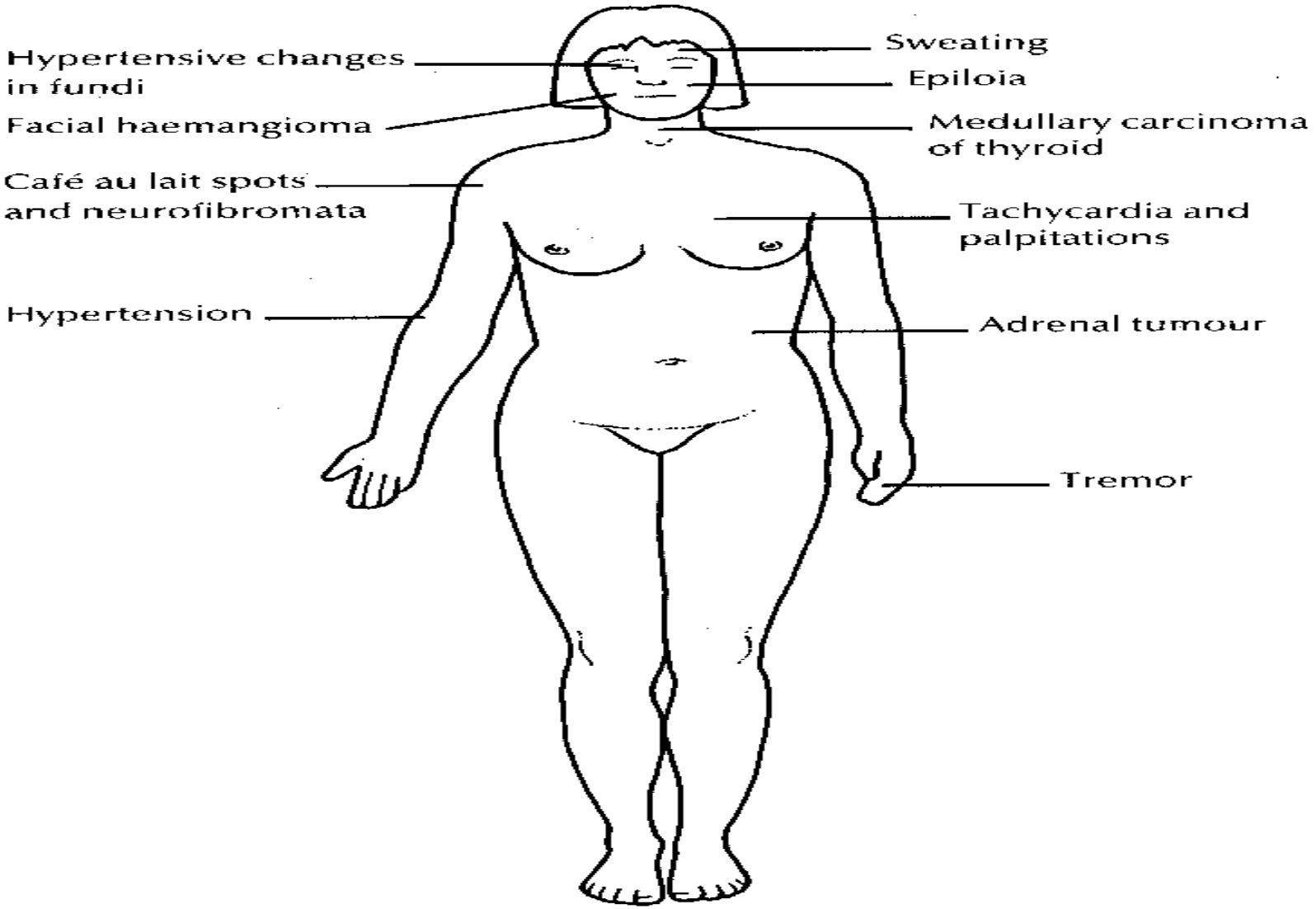
adrenalin, noradrenalin acting as vasoconstrictors and cardiac stimulants

Terapie Adrenalectomia

Alfa1-adrenoreceptor block

Doxazosinum (Zoxon tbl) ,Prazosinum (Deprazolin tbl)

Phaeochromocytoma (and associated conditions)



Thank You