Treating Patients with Endocrine Disorders and Treating Diabetic Patients

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Learning Objectives

Identify	Identify the major endocrine glands and describe the functions of each
Explain	Explain signs, symptoms, and potential oral manifestations of each endocrine gland disorder
Describe	Describe hormonal effects and oral health risk factors commonly associated with puberty, menses, contraceptives, and menopause.

Learning Objectives

- Describe the types of diabetes mellitus and major characteristics of each.
- Explain current knowledge about the oral health–diabetes link.
- Describe the risk factors and criteria used for diagnosis of prediabetes and diabetes.
- Summarize the lifestyle modifications and medications used to prevent and manage diabetes.
- Identify the key messages dental hygienists need to convey to patients with diabetes.

Endocrine Glands

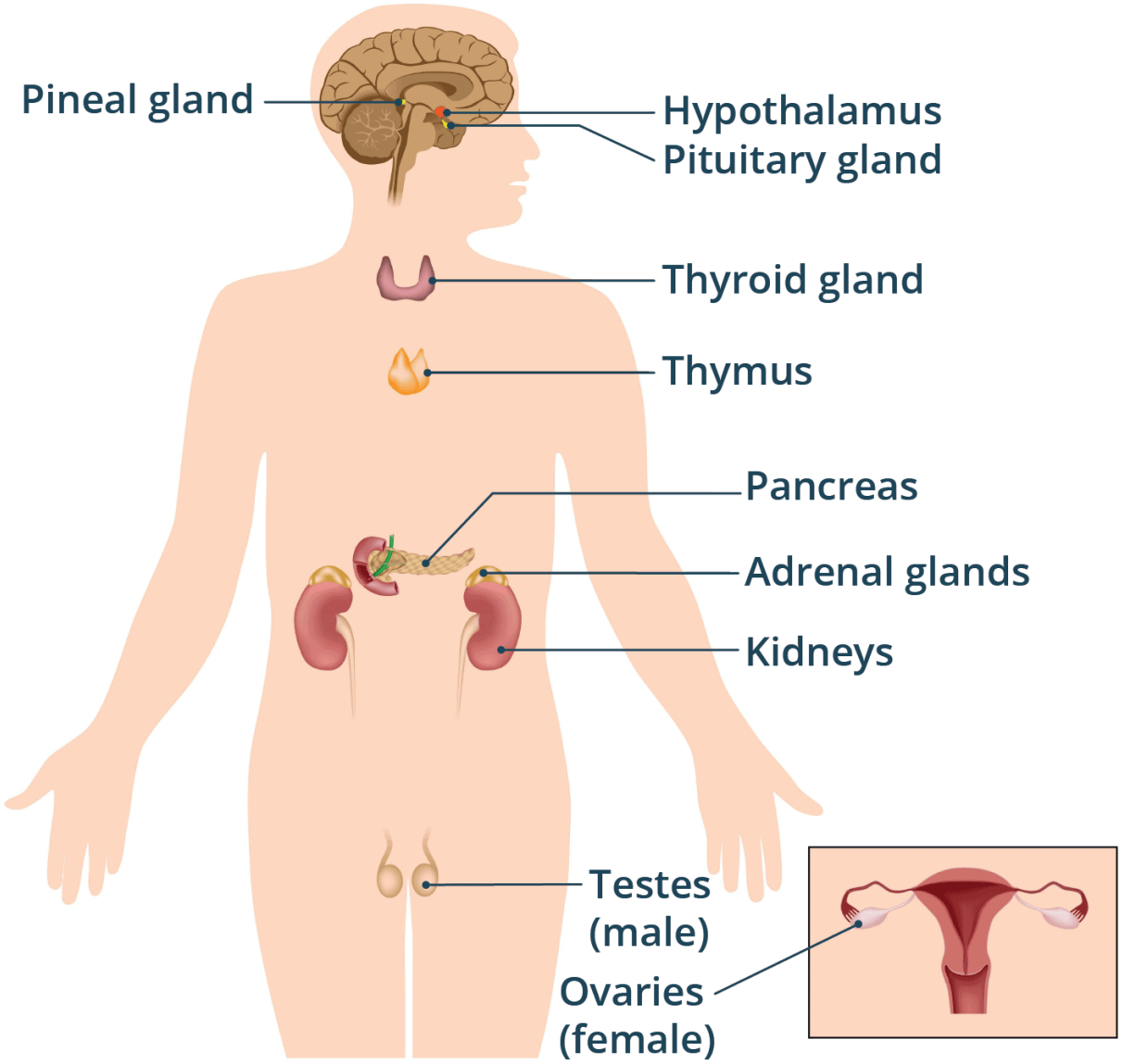
Secrete directly into blood or lymph

Pineal, pituitary, thyroid, parathyroid

adrenal, hypothalamus, thymus, pancreas and gonads

Hormones and Associated Glands

- Hypothalamus – controls pituitary gland
- Pituitary
  - Anterior – prolactin, growth hormone, adrenocorticotropin, TSH, LH, FSH
  - Posterior – oxytocin, vasopressin (ADH)
- Thyroid – T3 and T4
- Parathyroid – parathyroid hormone
- Thymus – humoral factor hormones
- Adrenals
  - Adrenal cortex – glucocorticoids (cortisol) and mineral corticoids (aldosterone)
  - Adrenal medulla –epinephrine (adrenaline) and norepinephrine
- Pancreas – insulin
- Gonads
  - Testes – testosterone
  - Ovaries – estrogen, progesterone, inhibin


Pineal gland
Hypothalamus
Pituitary gland
Thyroid gland
Thymus
Pancreas
Adrenal glands
Kidneys
Testes
(male)
Ovaries
(female)

Hormones

- Affect major functions
- Transported by blood or lymph
- May act directly on cells
- May act indirectly to control other glands
- Affect the following functions
  - Growth and development
  - Energy production
  - Food metabolism
  - Reproductive processes
  - Responses to stress and temperature

Regulation of Hormones

Stimulated by chemical signal

Controlled by negative feedback

Hyposecretion and hypersecretion causes physical and mental disturbances

Endocrine Gland Disorders

Either underproduction or overproduction of hormones

- Causes physical and biochemical changes
- Can affect oral cavity

Affect oral structures

- Healing response
- Infection recovery
- Stress response

Indicators and risk factors for periodontal disease

Affect periodontium

Alter tissue response to local factors

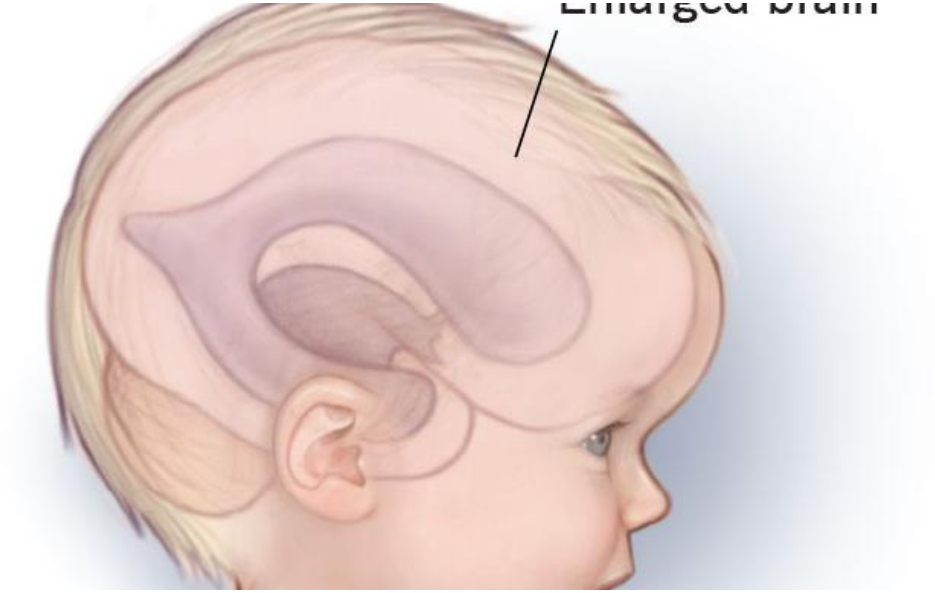
Common Symptoms of Pituitary Disorders

- Headaches
- Vision problems
- Mood swings or behavioral changes
- Weight changes
- Reproductive problems
- Hypertension

Oral Health Risk Assessment with Pituitary Disorders

- Macrocephaly
- Macrognathia
- Mandibular prognathism
- Open anterior bite
- Large pulp chambers
- Delayed eruption of primary and secondary teeth
- Increased risk for periodontal disease


Maxillary prognathism
Jaw without prognathism
Mandibular prognathism


Enlarged brain

Patient Management with Pituitary Disorders

- Referrals to orthodontics
- Increased hypertension
- Increased risk for insulin resistance and diabetes
- Contraindications for general anesthesia

Thyroid Gland Disorders

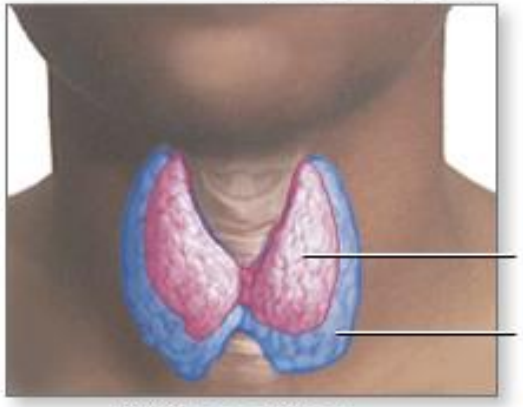
Hypothyroidism

- More common in women than men
- More common in 60 yr and older population
- Increase in infections
- Hashimoto's disease

Hyperthyroidism

- Excess iodine
- Graves disease
- Viral infection
- Consuming too much thyroid hormone medication

Exophthalmos (bulging eyes)



Diffuse goiter

Graves' disease is a common cause of hyperthyroidism, an over-production of thyroid hormone, which causes enlargement of the thyroid and other symptoms such as exophthalmos, heat intolerance and anxiety

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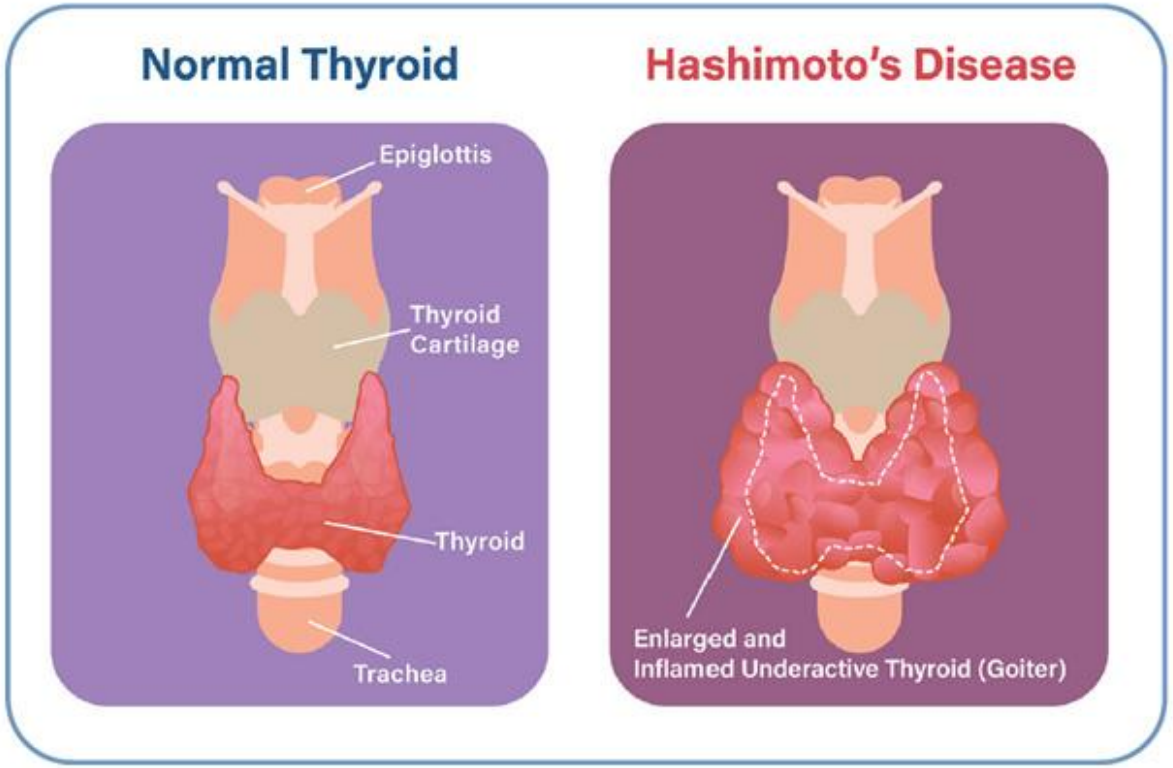


Oral Health Risk Assessment of Hypothyroidism Patients

- Increased risk
  - Periodontal disease
  - Oral candidiasis
  - Bleeding gums
  - Poor wound healing
- Treatment with Levothyroxine
- Monitor vitals
  - BP and pulse
- Avoid aspirin
- Myxedema coma

Oral Risk Assessment for Patients with Hyperthyroidism

- Accelerated tooth development
- Caution with use of analgesics and vasoconstrictors
- Checking vitals
  - BP
  - Pulse
- Thyroid storm

Parathyroid Disorders

- Hyperparathyroidism
  - Gland is producing too much parathyroid hormone (PTH)
  - Hypercalcemia leading to osteoporosis
  - Symptoms include the following
    - Bone pain, depression, fatigue
    - Frequent broken bones
    - Kidney stones, nausea, loss of appetite
- Hypoparathyroidism
  - Gland is producing too little PTH
  - Calcium increase
  - Phosphorus decrease
  - Symptoms include the following:
    - Abdominal pain, brittle nails, dry hair
    - Muscle cramps and spasms
    - Muscle and nerve irritation

Oral Manifestations of Hypoparathyroidism

- Delayed tooth eruption
- Congenitally missing teeth
- Shortened roots
- Delay or stopping of dental development
- Enamel hypoplasia
- Poorly calcified dentin
- Widened pulp chambers
- Mandibular tori
- Chronic candidiasis
- Paresthesia of the tongue or lips
- Twitching or spasm of the facial muscles

Mild Enamel Hypoplasia

Severe Enamel Hypoplasia

Oral Manifestations of Hyperparathyroidism

- Loss of alveolar bone
- Mandibular fractures
- Widened pulp chambers
- Demineralized teeth

Patient Management of Hyperparathyroidism

Home Fluoride treatments or trays

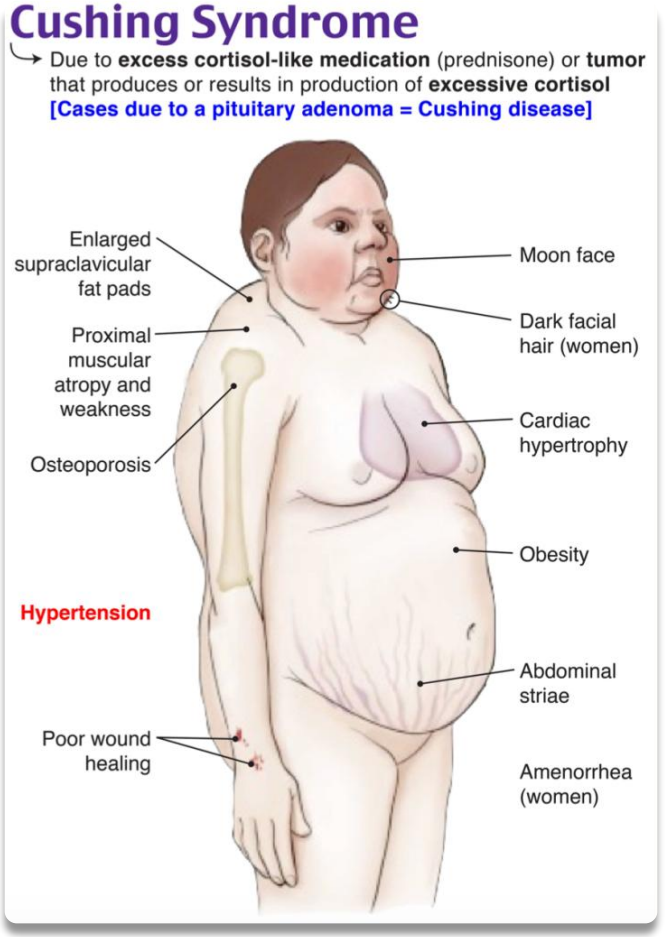
Increased risk of osteoporosis

Patient Management Associated with Hypoparathyroidism

- Fluoride trays or treatments
- Antifungals
- Calcium supplements

Cushing's Syndrome

- Caused by too much cortisol
  - Tumor in anterior pituitary
  - Tumor in adrenal gland
  - Exogenous steroids
- Symptoms
  - Weight gain, broad and rounded face
  - Buffalo hump
  - Hypertension and impaired healing
  - High Potassium levels
  - Hyperglycemia, glycosuria, polydipsia
  - Increased fractures, mood swings and depression



Oral Health Risks with Cushing's Syndrome

- Blue/Black areas affecting buccal mucosa, palate, tongue and lips
- Delayed wound healing
- Collagen loss
- Fragile skin and oral tissues
- Oral candidiasis

Patient Considerations for Patients with Cushing's Syndrome

ANTIFUNGAL TREATMENTS

ANTIVIRAL TREATMENTS

Primary Acute

Adrenal crisis	Gland fails to produce cortisol and aldosterone

Primary chronic adrenocortical insufficiency

Addison's disease	Autoimmune	Adrenal insufficiency or hypocortisolism

Secondary adrenocortical insufficiency

Rapid withdrawal of steroids	Insufficient steroid supplements combined with stress

Hypoadrenalism/ Addison's Disease/Adrenal Insufficiency

Oral Health Risks Associated with Adrenal Insufficiencies

- Hyperpigmentation of skin and mucosal surfaces
- Kaposi Sarcoma, Lymphoma or lip cancer
- Oral candidiasis