# Endocrine and Metabolic Disorders

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## Learning Outcomes

- **Understanding of the oral manifestations of systemic disease and care of the medically compromised patient**
  - Disorders affecting the
    - Pancreas – Diabetes Mellitus
    - Adrenal Glands – Cushing's syndrome, Addison's disease
    - Thyroid glands – Grave's disease, Hashimoto's thyroiditis
    - Pituitary glands – Gigantism, Acromegaly
    - Parathyroid glands – Hyperparathyroidism, Hypoparathyroidism
    - Pregnancy

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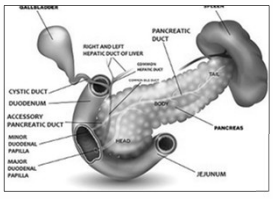
## Disorders of the Pancreas

- Two essential functions:
  - Endocrine
  - Exocrine
- Endocrine activity:
  - Insulin
  - Proinsulin
  - Amylin
  - C-peptide
  - Somatostatin
  - Pancreatic polypeptide
  - Glucagon
- Exocrine activity:
  - Proteolytic pancreatic enzymes that support digestion of food in the intestine
    - Trypsin
    - Chymotrypsin
    - Carboxypeptidase
    - Elastase

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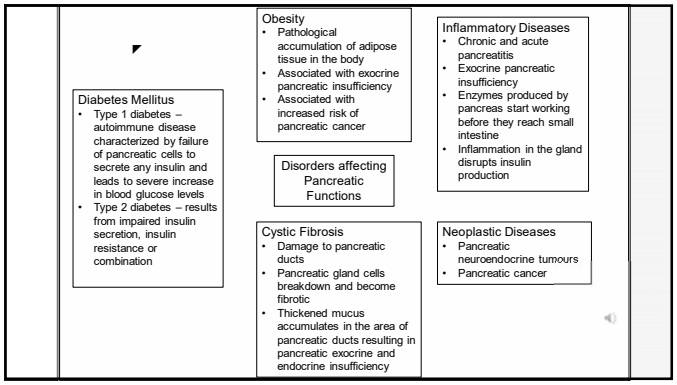


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## Diabetes Mellitus

- Diabetes Mellitus (DM) is a metabolic disease commonly characterised by an elevation of the blood glucose levels
- Pancreatic beta cells produce insulin which facilitates absorption of glucose into cells.
- DM occurs due to lack of insulin production or insulin sensitivity
- Most common types:
  - Type 1 DM: associated with failure in insulin production resulting from destruction of pancreatic beta cells by T-cell mediated autoimmunity
  - Type 2 DM: characterised by insulin resistance and reduction of insulin production
- **It is important that all forms of diabetes to be diagnosed and managed at early stage to prevent or slow down potential complications**

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## Oral manifestations of Diabetes Mellitus

- More than 90% of diabetic patients suffered from oral complications
- Possible mechanism that may be related to oral complications of diabetes include impaired neutrophil function, increased collagenase activity, reduction in collagen synthesis, microangiopathy and neuropathy

**TABLE 1. Prevalence of Oral Manifestations in Controlled and Uncontrolled Diabetes (9)**

| Oral Manifestation | Prevalence in Controlled Type 2 Diabetes (%) | Prevalence in Uncontrolled Type 2 Diabetes (%) |
|---|---|---|
| Hyposalivation | 68 | 84 |
| Halitosis | 52 | 76 |
| Periodontitis | 32 | 48 |
| Burning mouth sensation | 32 | 24 |
| Candidiasis | 28 | 36 |
| Taste alteration | 28 | 44 |

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## Oral manifestations of Diabetes Mellitus

- Dry mouth
  - Xerostomia (80%) and salivary gland hypofunction
  - Prevalence: 52-76%
  - Highest level of salivary gland hypofunction is observed in diabetics with poor glycaemic control
  - Reduced salivary flow as a result of polyuria and dehydration
  - Studies have found that urea and glucose levels in saliva were significantly higher in DM patients than healthy subjects
  - Salivary glucose promotes proliferation and colonization of bacteria in oral cavity
  - Glucose is basis for candida development and decrease in neutrophil activity
  - Results in dysgeusia, dental caries, oral pain, dysphagia, lower quality of life

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## Oral Manifestations of Diabetes Mellitus

- Dental Caries
  - Development of new and recurrent dental caries
  - Reduced cleansing and buffering capacity of saliva
  - Increase of carbohydrate in saliva
  - Increase level of oral yeast, streptococci mutans and lactobacilli
    - Lead to increase in incidence of tooth decay
  - Chronic hyperglycaemia may cause irreversible pulpitis
- Periapical pathology
  - Higher prevalence of periapical lesions in patients with poorly controlled diabetes
  - DM patients have lower success rate of endodontic treatment

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## Oral manifestations of Diabetes Mellitus

- Periodontal disease
  - Most common oral manifestation
  - Poor glycaemic control associated with outbreak and progression of gingivitis, periodontitis, alveolar bone loss
  - Prevalence of severe periodontitis in diabetic patients compared to non-diabetic patients: 59.6% vs 39%
  - Possible mechanisms:
    - Alterations in host defence response (neutrophil dysfunction)
    - Subgingival microflora
    - Structure and metabolism of collagen
    - Vascularity and gingival crevicular fluid
    - Risk factors: poor oral hygiene, poor metabolic control, longer duration of diabetes, smoking
  - Elimination of pathogens by treatment leads to decrease of inflammation, which in turn reduces insulin resistance = reduction in glucose levels.
    - **Two – way relationship**

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## Oral Manifestations of Diabetes Mellitus

- Oral Infections
  - Fungal, bacterial infections
  - Decreased salivary flow rate, absence of antimicrobial effects in addition to impaired defence mechanism and poor metabolic control play important role in developing infection
  - Higher rates of candida colonization reported in T1DM compared to T2DM (84% vs 68%), 27% in non-diabetics
  - Candida related lesions: denture stomatitis, angular cheilitis, median rhomboid glossitis common
  - Most common in diabetic patients who smoke, wear dentures, have poor glycaemic control, and use steroids and broad-spectrum antibiotics

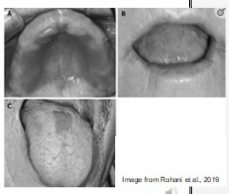

Image from Rohani et al., 2019

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## Oral Manifestations of Diabetes Mellitus

- Burning Mouth
  - Attributed to poor glycaemic control, metabolic alterations in oral mucosa, angiopathy, candida infection and neuropathy
- Taste dysfunction
  - Seen in poorly controlled diabetes
  - Sweet or salty taste disorder
  - Salivary dysfunction can contribute to altered taste sensation

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## Oral Manifestations of Diabetes Mellitus

- Oral mucosal alterations
  - Coated, fissured tongue
  - Recurrent aphthous stomatitis
  - Oral lichen planus/oral lichenoid dry reaction
  - Controversial
- Poor wound healing
  - Well-known complication during oral surgeries
  - Delayed vascularization, diminished blood flow and hypoxia, reduction in innate immunity, decreased growth factor production, psychological stress

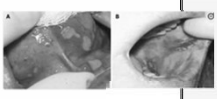

Image from Rohani et al., 2019

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## Dentists' role in caring for patients with Diabetes Mellitus

- Diabetes is a common disease with concomitant oral manifestations that can modify dental care needs
- Be familiar with diagnosis and prevention techniques
- Effective management of diabetic patients
  - Cooperation between patient, doctor, dentist
  - Regular check-ups will allow dentists to anticipate patient needs and interact competently with other health care professionals
  - Careful examination of oral cavity including mucosa, periodontal inflammation, bleeding and general state of teeth

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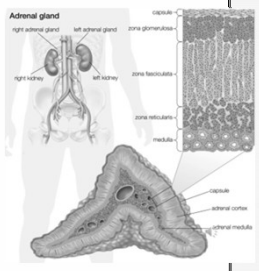
## Disorders of the Adrenal Glands

- Adrenal glands major regulators of body homeostasis and endocrine stress response
- Three morphologically and functionally distinct compartments
  - Outer zona glomerulosa: produces aldosterone
  - Zona Fasciculata: glucocorticoid synthesis, production of cortisol
  - Zona reticularis: adrenal androgens: androstenedione, DHEA
- Dysregulation of signalling pathways in adrenal cortex associated with development of adrenal tumours

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## Disorders of the Adrenal Glands

- Cushing syndrome
  - Prolonged elevation in plasma cortisol
    - Exogenous: glucocorticoid use
    - Endogenous : benign pituitary adenoma, benign or malignant adrenal tumours
  - Estimated prevalence: 2-3 per million to 8 per million persons, annually

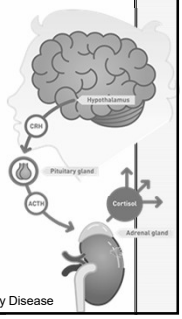


Image from: National Institute of Diabetes and Digestive and Kidney Disease

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## Cushing Syndrome

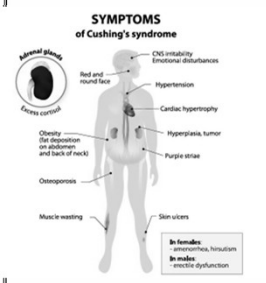


Table 1. Clinical Signs and Symptoms of Cushing Syndrome and Common Laboratory Abnormalities[a]

| Frequent and nonspecific for Cushing syndrome, % | Frequent and Cushing syndrome specific, % |
|---|---|
| Recent weight gain, 70-95 | Round face, ≤90 |
| Plethora, 70-90 | Osteopenia or osteoporosis and fragility fractures, ≤80 |
| Oligo or amenorrhea, 70-80 | Muscle weakness, 60-80 |
| Depression, 50-80 | |
| Hypertension, 60-90 | |
| Hirsutism, 50-75 | |
| Sleep disorders, >60 | |
| Dyslipidemia, 40-70 | |
| Decreased libido, 25-90 | |
| Cognitive impairment (exact prevalence unknown) | |
| Vitamin D deficiency (exact prevalence unknown) | |
| **Less frequent and nonspecific to Cushing syndrome, %** | **Less frequent and Cushing syndrome specific, %** |
| Kidney stones, ≤50 | Dorsocervical fat pad, >50 |
| Diabetes, >30 | Purple striae, >50 |
| Atherosclerosis, >30 | Easy bruising, >50 |
| Acne, >50 | Thin skin, >40 |
| Hair loss, 30 | |
| **Laboratory abnormalities[a]** | |
| Increased leukocytes with decreased lymphocytes, eosinophils, monocytes, and basophils | |
| Elevated glucose and insulin levels | |
| Hypokalemia | |
| Increased triglycerides and total cholesterol levels; high-density lipoprotein cholesterol levels are variable | |
| Elevated liver enzymes | |
| Changes in activated partial thromboplastin time and plasma concentrations of procoagulant and anticoagulant factors in some patients | |
| Hypercalciuria, more rarely hypocalcemia, hypophosphatemia, a decrease in phosphate maximum resorption and an increase in alkaline phosphatase activity; elevated magnesium is extremely rare | |

Image from: Reinke et al., 2023

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## Oral manifestations of Cushing's syndrome

- Increased risk of developing periodontal disease
- Inhibit new bone formation
  - Delayed wound healing
  - Osteoporosis of jaw bone
- Higher risk of oral candidiasis, recurrent aphthous ulcers

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## Dental considerations in Cushing's syndrome

- Obtain comprehensive medical records in patients with CS, including the dosage and frequency of glucocorticoids.
- OHCPs should avoid the abrupt discontinuation of corticosteroids and consult with the patients' physicians.
- Be aware of drug interactions with patients who are taking glucocorticoids.
- Monitor vital signs at baseline and during dental procedures to avoid hypertensive episodes.
- OHCPs should carefully evaluate pain management with aspirin and NSAIDs in patients with CS at risk of peptic ulcer.

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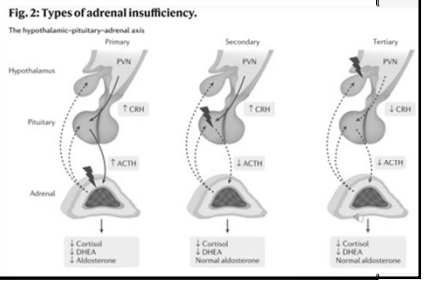
## Addison's disease

- Adrenal insufficiency characterised by adrenal hypofunction = inadequate production of glucocorticoids, especially cortisol
- Primary: Addison's disease
- Secondary: disease of the pituitary or hypothalamus, chronic use of steroids
- Tertiary: hypothalamic abnormalities or dysfunction
- AD is a severe disease with a fatal outcome without adequate hormonal replacement.




Hahner et al., 2021

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## Causes of Addison's disease

| Aetiology | Pathogenesis | Diagnostic tools |
|---|---|---|
| Autoimmune | T and B cell autoimmunity against adrenocortical cells | 21-Hydroxylase autoantibodies |
| Infection | Mycobacteria, bacteria (e.g. *Neisseria meningitidis*, *Haemophilus influenzae*, *Pseudomonas aeruginosa*), viruses (e.g. human immunodeficiency virus, herpes simplex, cytomegalovirus) or fungi (e.g. *Pneumocystis jirovecii*) | Culture, QuantiFERON test, PCR, adrenal CT |
| Tumour | Primary tumour (bilateral), metastasis (bilateral), adrenal lymphoma (bilateral) | Adrenal CT |
| Bleeding | Anti-phospholipid syndrome, anticoagulant therapy, disseminated intravascular coagulation | Adrenal CT, phospholipid autoantibodies |
| Surgery | Bilateral adrenalectomy | Patient history |
| Infiltrative | Amyloidosis<br>Haemochromatosis<br>Histiocytosis | Adrenal CT, subcutaneous fat biopsy<br>Ferritin, *HFE* sequencing<br>Adrenal imaging |
| Genetic[a] | Congenital adrenal hyperplasia, congenital lipoid adrenal hyperplasia, adrenoleukodystrophy (X-linked), adrenal hypoplasia congenita, autoimmune polyglandular syndrome type 1 | Sequence of relevant gene |
| Medication[b] | Enzyme inhibition (ketoconazole, fluconazole, itraconazole, etomidate, aminoglutethimide, metyrapone, trilostane, osilodrostat); adrenolytic effect and increased cortisol metabolism (mitotane); inflammation (checkpoint inhibitors) | Medication and patient history |

Hahner et al., 2021

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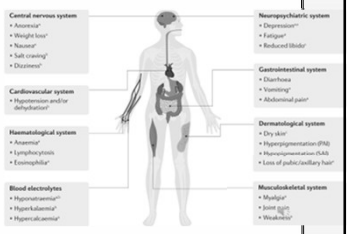
## Clinical manifestations of Addison's disease

- Develop slowly
- Weakness
- Fatigue
- Loss of appetite
- Weight loss
- Pigmentation of skin and oral mucosa
- Clinical features more prominent in Addison's disease than in secondary adrenal insufficiency
- Can occur at any age – most often during 2nd and 3rd decade of life




Hahner et al., 2021

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## Oral manifestations of Addison's disease

- Mucosal pigmentation – gingiva, vermillion border of lip, buccal mucosa, palate, tongue
- Patchy – macular-like or nodular-like
- Dark brown – black
- Asymptomatic
- Usually occur before extra oral manifestations
- Non-specific finding
- Differential diagnosis:
  - Peutz-Jeghers syndrome
  - McCune-Albright syndrome
- Elevated ACTH, low AM cortisol

Figure 2: Images showing the presence of brown and black patches and plaques distributed in the (A) Left buccal mucosa (B) Hard palate (C) Right buccal mucosa.

Bouguezzi et al., 2020

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## Management of Addison's disease

- Immediate treatment as potentially life-threatening condition
- Patients with adrenal crisis require intensive fluid resuscitation with IV saline, dextrose and hormone replacement to correct lack of glucocorticoid
- Hydrocortisone

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## Dental considerations in Addison's disease

- Adrenal crisis can be precipitated by stress (e.g. stress associated with surgical procedures or trauma)
- Patients with primary adrenal insufficiency are at higher risk of experiencing adrenal crisis
- Underlying cause is decrease in endogenous production of cortisol
- Dentist must be alert to recognize the condition as early as possible
- Risk factors associated with adrenal crisis in dental office
  - Unrecognized adrenal insufficiency
  - Poor health status
  - Stability at time of dental treatment
  - Pain
  - Infection
  - Invasive procedures
- In presence of risk factors, patients undergoing minor to moderate oral surgery should receive supplementation of 25-75 mg hydrocortisone equivalent

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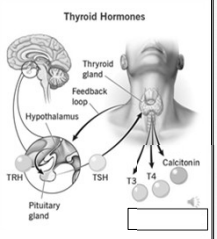
## Thyroid glands

- Primary function of thyroid follicular cells is synthesis of thyroid hormones
  - Tetraiodothyronine (T4) = thyroxine
  - Triiodothyronine (T3)
- Function
  - Growth
  - Basal metabolic rate control
  - Body temperature
  - Gluconeogenesis
  - Lipolysis
  - Proteolysis
  - Glucose absorption
- Stimulated through hypothalamic-pituitary axis
- Dysfunction of this system can result in potentially fatal conditions

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## Grave's disease

- Hyperthyroidism
- Enlarged and overactive thyroid gland
- Most common in Caucasian and Asian women aged 20 – 40 years
- Pathophysiology: autoimmune
  - Autoantibodies to the TSH receptors of the follicular cells lead to stimulation of thyroid hormone production
  - Due to negative feedback effect of thyroid hormone on anterior pituitary gland, TSH levels will be low

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## Grave's disease

- Enlarged, overactive thyroid gland
- Ocular abnormalities
- Localised dermopathy
- Extra thyroidal manifestations
  - Thymus
  - Pituitary glands
  - Testes
  - Kindy
  - Heart
  - Brain
  - Adipose tissue
  - Fibroblasts
  - Bone

- Clinical presentation
  - Anxiety
  - Weight loss
  - Palpitations
  - Insomnia
  - Elderly patients can present with cardiovascular symptoms
    - Tachycardia
    - Atrial fibrillation
  - Distinct feature of Grave's disease is sudden onset of symptoms

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## Oral manifestations of Grave's disease

- Increased susceptibility to caries, periodontal disease
- Enlargement of extra glandular thyroid tissue
- Maxillary or mandibular osteoporosis
- Loss of taste
- Accelerated dental eruption
- Early primary tooth exfoliation
- Oral burning
- Thyroid may be enlarged or noticeable palpable
- Development of connective tissue diseases like Sjogren's syndrome or Systemic lupus erythematosus

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## Dental management for Grave's disease

- Haemostasis:
  - Elevated blood pressure and heart rate
  - Longer duration to stop bleeding
- Anti-thyroid drugs can cause hypoprothrombineamia and bleeding
- Susceptibility to infections: inadequate woundn healing, oral infections
- NSAIs should be used in caution
- Patients have increased anxiety, and stress or surgery can trigger thyrotoxic crisis. Epinephrine contraindicated

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## Hashimoto's Thyroiditis

- Decrease in thyroid hormone and thyroid gland function
- Chronic thyroiditis (Hashimoto's disease)
- Symptoms:
  - Slower metabolic rate
  - Weight gain
  - Lethargy
  - Intolerance to cold
  - Dry and cool skin
  - Puffiness of the face and eyelids
  - Blood pressure normal, but heart rate slow

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## Oral manifestations of Hashimoto's Thyroiditis

- Childhood hypothyroidism = cretinism
  - Thick lips
  - Large protruding tongue (Macroglossia)
  - Delayed eruption of teeth
  - Impacted mandibular second molars
- Common oral findings:
  - Macroglossia
  - Dysgeusia
  - Delayed eruption
  - Poor periodontal health
  - Altered tooth morphology
  - Delayed wound healing

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## Dental considerations for hypothyroidism

- Haemostasis: longer time to achieve
- Susceptibility to infection due to delayed wound healing
- Drug interactions of l-thyroxine include increased metabolism of phenytoin, carbamazepine. It also increases effects of warfarin

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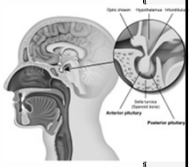
## Pituitary Gland

- The normal anterior pituitary secretes six main hormones from five separate cell lineages:
  - adrenocorticotrophic hormone (ACTH) from corticotroph cells
  - thyroid stimulating hormone (TSH) from thyrotroph cells
  - growth hormone (GH) from somatotroph cells
  - prolactin from lactotroph cells
  - follicle stimulating hormone (FSH) and luteinising hormone (LH) from gonadotroph cells.
- The posterior pituitary releases two hormones, which are synthesised in the hypothalamus – arginine vasopressin (also known as antidiuretic hormone) and oxytocin.



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## Pituitary Disorders

**Table 2. Pituitary adenoma subtypes[27]**

| | |
|---|---|
| Clinically non-functioning pituitary tumours | • Silent gonadotroph adenoma<br>• Other non-secretory adenomas from corticotroph, lactotroph and somatotroph cell lineage<br>• Null cell adenoma |
| Functioning pituitary tumours | • Prolactinoma<br>• GH-secreting adenoma (acromegaly)<br>• ACTH-secreting adenoma (Cushing's disease)<br>• Rare functioning tumours – thyrotropinoma, FSH-secreting pituitary adenoma |

*ACTH, adrenocorticotrophic hormone; FSH, follicle stimulating hormone; GH, growth hormone*

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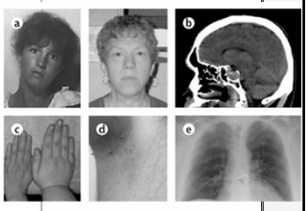
## Disorders of the Pituitary Gland: Acromegaly

Acromegaly

- Enlargement of hands and feet
- Frontal bossing
- Splayed dentition
- Mandibular enlargement – jaw malocclusion
- Enlarged tongue
- Skin tags
- Oily skin
- Sweating
- Hirsutism (women)
- Obstructive sleep apnoea
- Osteoarthritis
- Carpal tunnel syndrome
- Hypertension
- Cardiomyopathy
- Goitre
- Liver/spleen enlargement
- Colonic polyps
- Diabetes
- Tall stature (prepubertal onset = gigantism)

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## Oral manifestations of Acromegaly

Table 1

Oro-maxillo-facial features of acromegaly and possible treatments.

| Symptoms/Signs | Diagnosis | Possible Treatments |
|---|---|---|
| Third-class malocclusion | Dental evaluation | No treatment or orthodontic treatment—if necessary, orthodontic-surgical treatment—in the inactive phase of the disease |
| Dental diastema | Dental evaluation | Possible conservative treatment in any phase of the disease, or orthodontic treatment, preferably not in the active phase of the disease |
| Macroglossia | Mallampati or Modified-Mallampati evaluation | Medical therapy for the control of acromegalic syndrome; possible surgical or conservative treatment of OSAS with special dental appliances |
| Osseous tori or exostoses | Dental evaluation | No treatment; surgical treatment in the event that the exostoses hinder the insertion of dental prostheses |
| Incongruity of mobile prostheses or implant based prostheses, and possible breakage | Dental evaluation | Adjustment of the prosthetic bases or replacement of the same; in case of prostheses fixed on implants, verification and possible adjustment of the intraosseous pillars, preferably not in the active phase of the disease |
| Frontal elements inclination | Orthodontic evaluation | No treatment or orthodontic treatment in the inactive phase of the disease |
| Hypercementosis | Fortuitous, following routine radiographic examinations | No treatment |
| Clicks and TMJ pains | Dental and gnatologic evaluation, radiographic deepening with RM | Functional treatment with gymnastics for the temporomandibular joint or application of a customized bite<br>The BruxApp app can be adopted under the control of the dentist to monitor and correct incorrect or flawed positions maintained during the day by the patient and to guide postural re-education |
| Thickening of gingival tissues | Dental evaluation | No treatment or surgical treatment in the inactive phase of the disease |

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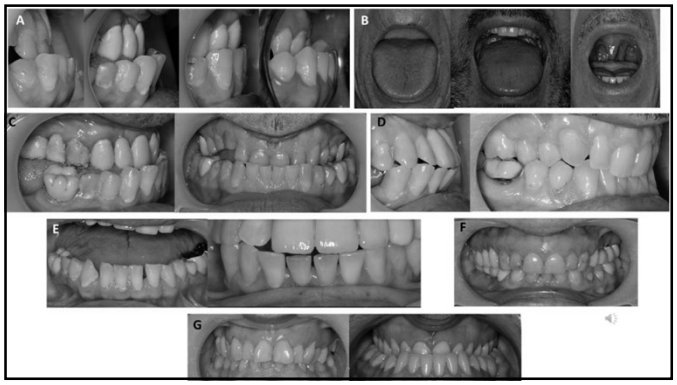


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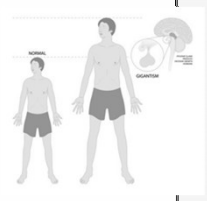
## Gigantism

- Occurs when growth hormone hypersecretion occurs before fusion of the long bone epiphysis
- Rare
- Suspected when patient's heigh is 3 standard deviations above normal mean height or 2 standard deviations above the adjusted mean parental height
- Associated with various syndromes:
  - Neurofibromatosis
  - Carney complex
  - McCune Albright syndrome

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## Oral Manifestations of Gigantism

- Teeth size are proportional to generalised enlarged body size
- Interdental spacing
- Dental malocclusion
- Hypercementosis of roots
- Prognathic mandible
- Frontal bossing

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## Role of Dentist in Acromegaly and Gigantism

- Early diagnosis can improve quality of life and reduce risk of mortality
- Assessment of oro-facial disorders e.g. macroglossia, diastemas, prognathism can be assessed early
- Role in diagnosis of co-morbidities: e.g. obstructive sleep apnoea

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## Disorders of Parathyroid Glands

- 4 small glands embedded in the posterior aspect of the thyroid gland
- Main function is production and secretion of:
  - Parathyroid hormone (PTH)
- Levels of PTH and serum calcium are inversely proportional
- At low serum calcium levels, PTH in conjunction with vitamin D works to mobilize calcium stores and increase calcium absorption and reabsorption
- Both calcium and vitamin D provide ngative feedback to parathyroid glands
- As levels of calcium and vitamin D increase, they bind receptors of Parathyroid glands and inhibit production and release of PTH

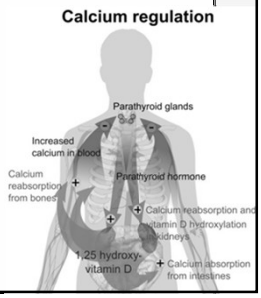


Image from: Lofrese et al., 2023

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## Disorders of Parathyroid Glands

- Rare conditions
- Misregulation of calcium homeostasis due to alterations in secretion of PTH
- Primary hyperparathyroidism is most common
  - Hypercalcaemia alongside increased serum PTH concentration
- Hypoparathyroidism is less common
  - Low calcium levels in blood serum due to inadequately low PTH levels

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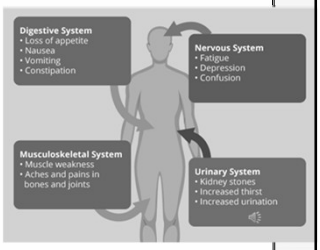
## Hyperparathyroidism

- Dangerously elevated levels of calcium in blood
- Clinical symptoms:
  - Nausea
  - Vomiting
  - Constipation
  - Kidney stones
  - Bone pain
  - Psychosis or altered mental status
- Primary hyperparathyroidism: result of parathyroid adenoma, hyperplasia or carcinoma
- Secondary hyperparathyroidism: chronic hypocalcaemic state
  - Chronic kidney disease or vitamin D deficiency
- Tertiary hyperparathyroidism: long-term hyperparathyroidism
  - End stage renal disease
  - Leads to hyperplasia of parathyroid glands

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## Oral manifestations of hyperparathyroidism

**From: Systematic review of oral manifestations related to hyperparathyroidism**

| | |
|---|---|
| **Systemic symptoms** | |
| General | Anemia (fatigue, weakness, dyspnea), weight loss, fever, polydipsia, edema |
| Neurologic | Headaches, confusion, memory loss, insomnia, anxiety, depression, lethargy, suicide, coma |
| Renal | Nephrocalcinosis, nephrolithiasis, polyuria/nocturia, hematuria |
| Skeletal | Bone pain, arthralgia, osteoporosis, osteomalacia, brown tumors, fracture |
| Digestive | Constipation, nausea, vomiting, peptic ulcers, cholethiasis, pancreatitis |
| Cardiac | Hypertension |
| **Oral symptoms** | |
| Expansile | Speaking difficulties, mastication difficulties, airway obstruction, malocclusion |
| Oral pain | |
| Neuropathy | |
| Tooth mobility | |
| Fracture | |
| Tooth structure | Hypoplastic enamel, hypoplastic dentin, loss cementum, pulp calcification, periodontitis |
| Soft tissue | Giant cell epulis, mucosal pallor (anemia) |
| **Radiographic findings** | |
| Cortical destruction | |
| Tooth displacement | |
| Loss LD | |
| Root resorption | |
| Obliteration IAN | |
| Altered calcification | |

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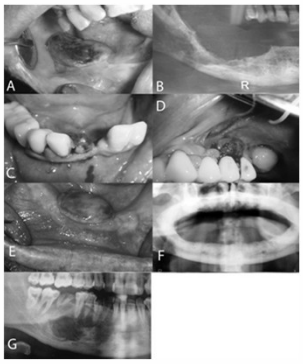


Image from: Lajolo et al., 2020

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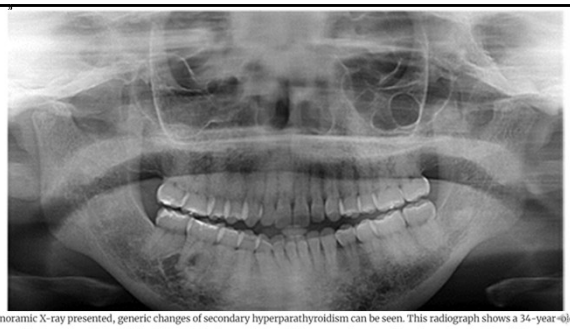

In the panoramic X-ray presented, generic changes of secondary hyperparathyroidism can be seen. This radiograph shows a 34-year-old female who presented in December 2015 on dialysis for ESRD before receiving a kidney transplant. A well-corticated periapical radiolucency surrounding the distal root of tooth #46 with loss of lamina dura, diagnosed as a brown tumor, can be detected. There are also sclerotic changes throughout the mandible, most notable in the posterior left

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## Management of hyperparathyroidism

- Treatment must focus on identification and type of hyperparathyroidism
- For all suspected patients:
  - Serum PTH
  - 24-h urinary calcium
  - 25-hydroxy vitamin D
- Parathyroidectomy most commonly reported treatment
- Treatment of underlying aetiology would lead to dissipation of oral bone involvement
- Role of dentist: occasionally indication of illness might be a growth in the jaw
- Oral manifestations and dental radiographs can recognise secondary HPT early

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## Hypoparathyroidism

- Rare disease that results in hypocalcaemia
- Symptoms range from paraesthesias and muscle cramps to seizures and laryngospasms
- Most common cause is injury to or removal of parathyroid gland during anterior neck surgery
- Often associated with basal ganglia calcification, cataratcs and neuropsychiatric symptoms
- Goal of treatment is to maintain blood calcium level near the low end of normal range while preventing symptoms of hypocalcaemia
  - Oral calcium, active vitamin D

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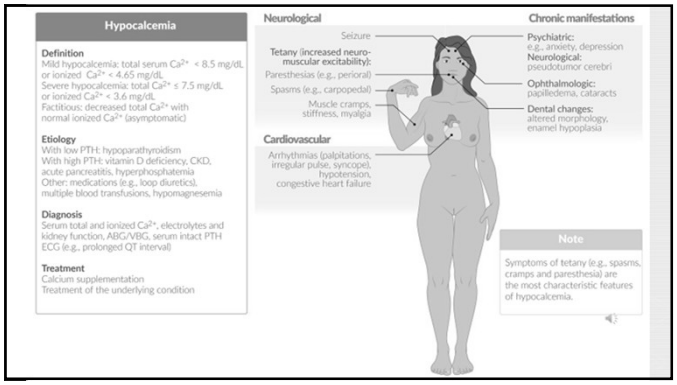


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## Oral manifestations of hypoparathyroidism

- Dental abnormalities
  - Enamel hypoplasia
  - Delayed eruption
  - Hypodontia and microdontia
  - Poorly calcified dentine
  - Widened pulp chambers
  - Dental pulp calcifications
  - Shortened roots with blunt apex
  - Malformed roots
- Delay or cessation of dental development
- Ankylosis
- Caries
- Chronic candidiasis
- Paraesthesia of tongue or lips
- Alterations in facial muscles

Kelly et al., 2009

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## Dental management of the patient with hypoparathyroidism

- Prevention of caries with periodic check up, diet and oral hygiene advice
- Before performing dental treatment, serum calcium levels should be determined
  - > 8 mg/100 ml to prevent cardiac arrhthmias, seizures, laryngospasms, bronchospasms

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## Pregnancy

- Increase in oestrogen and progesterone important for normal progression of pregnancy
- Increased hormonal secretion and foetal growth induce several systemic changes
  - Cardiovascular
  - Haematologic
  - Respiratory
  - Renal
  - Gastrointestinal
  - Endocrine
  - Genitourinary
- Local changes also occur in oral cavity

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## Oral manifestations of pregnancy

- Gingivitis
- Gingival hyperplasia
- Pyogenic granuloma
- Salivary changes – reduced whole stimulated saliva flow rate
- Increased facial pigmentation
- Worsen pre-existing periodontal disease

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## Dental treatment during pregnancy

- Most dental treatment can be carried out safely during pregnancy
- Elective treatment best performed in second trimester of pregnancy
- Elective procedures requiring general anaesthesia, or IV sedation should be deferred until after the birth, and preferably after breastfeeding stopped
- If unsure pregnancy status – defer treatment decisions until pregnancy status known
- If intraoral radiographs are necessary for assessment or diagnosis in infection or trauma, there is no reason to defer them
- Use leaded drape
- Before prescribing consider general principles of dry use in pregnancy or breastfeeding

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- Thank you for listening!
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