SYSTEMIC DISEASES
with manifestations in oral cavity
OUTLINE

• Oral manifestations of endocrine disorders
• Oral manifestations of liver diseases
• Oral manifestations of gastrointestinal diseases
• Oral manifestations of renal diseases
• Oral manifestations haematological diseases
OVERVIEW

• Endocrine System
• Common Endocrine Diseases
• Risk factors
• Signs and symptoms
• Dental Management & Considerations
Endocrine system is responsible for hormonal secretion

- Diversify its function through hypothalamus and pituitary
- Controls physiological process and homeostasis

Oral manifestations of endocrine disorders

- Hyperfunction
- Hypofunction
Pituitary gland (hypophysis)
Growth hormone (GH) - GH stimulates growth in childhood and is important for maintaining a healthy body composition and well-being in adults. In adults, GH is important for maintaining muscle mass and bone mass.
ACROMEGALY

• Acromegaly (from Ancient Greek άκρος "extremities" and μεγάλος "large") is a syndrome that results when the anterior pituitary gland produces excess growth hormone (GH) after epiphyseal plate closure at puberty.

• If GH is produced in excess prior to epiphyseal plate closure, the result is gigantism (or giantism).

• A number of disorders may increase the pituitary's GH output, although most commonly it involves a tumor called pituitary adenoma.
Features that result from high level of GH include:

- **Soft tissue swelling** visibly resulting in enlargement of the hands, feet, **nose**, **lips and ears**, and a general thickening of the skin.
- Soft tissue swelling of the **vocal cords** resulting in a characteristic thick, **deep voice** and slowing of speech.
- Generalized expansion of the skull at the fontanelle. **Pronounced brow protrusion**, often with ocular distension.
- Pronounced lower jaw protrusion (**prognathism**) with attendant **macroglossia** (enlargement of the tongue) and **teeth spacing**.
- Hypertrichosis, hyperpigmentation, and hyperhidrosis may occur in these patients.
Both jaws showing the classic spacing of teeth due to acromegaly.

Mandibular overgrowth leads to prognathism, maxillary widening, teeth spacing and malocclusion.

Macroglossia with “impresiones dentorum”

Brow ridge and forehead protrusion
Diagnosis:

- If acromegaly is suspected, medical imaging and medical laboratory investigations are generally used together to confirm this condition.
- An MRI of the brain focusing on the sella turcica after gadolinium administration allows for clear delineation of the pituitary and the hypothalamus and the location of the tumor.

Treatment:

- Currently, treatment options include surgical removal of the tumor, drug therapy, and radiation therapy of the pituitary.
The hypothalamus contains neurosecretory cells that release hormones into the blood vessel leading to the anterior pituitary. These hormones include oxytocin and ADH, which affect uterine muscles and kidney tubules, respectively.

The hypothalamus also releases hormones that stimulate the anterior pituitary to produce gonadotropins (FSH and LH), which in turn stimulate the gonads to produce hormones like estrogen and progesterone. Additionally, the hypothalamus releases thyroid-stimulating hormone (TSH) which regulates the thyroid gland, and adrenocorticotropic hormone (ACTH) which affects the adrenal cortex.

A special hormone, growth hormone (GH), is also produced by the hypothalamus and released into the blood. It affects various tissues throughout the body, including the liver, muscle, and bone.

The diagram also illustrates the release of other hormones from the hypothalamus such as prolactin (PRL) and endorphins, which are involved in milk production and pain regulation, respectively.
How old is the patient?
Features that result from low level of GH include:

- If the problem is chronic, symptoms consist of fatigue, weight loss, hypoglycemia (low blood sugar levels), anemia and hyponatremia (low sodium levels).
- If the onset is abrupt, collapse, shock and vomiting may occur.
- Delayed puberty (in adolescents)
- Microdontia
- Retarded tooth eruption (eruption cysts)
Hypopituitarism (Pituitary dwarfism)

Retarded tooth eruption (eruption cyst)
The thyroid gland is one of the largest endocrine glands and consists of two connected lobes.

Thyroid gland generally controls body metabolism.

It participates in these processes by producing thyroid hormones triiodothyronine (T3) and thyroxine (T4), synthesized from iodine and tyrosine.

These hormones regulate the growth and rate of function of many other systems in the body.
Hypothyroidism and hyperthyroidism are the two most common thyroid disorders in women between the age of 20 and 50, who are also five times more likely than men to develop thyroid disorders.

Hyperthyroidism is the condition caused by unregulated production of thyroid hormones. (decrease TSH, increase T3 and T4)

Hypothyroidism is defined by a decrease in thyroid hormone production and thyroid gland function. (increase TSH, decrease T3 and T4)
CAUSES:
HYPERTHYROIDISM

Other risk factors:
- Gender
- History
- Age
- Smoking
- Trauma to the thyroid
- Major stress

CAUSES:

- Medications
- Thyroid nodules
- Thyroiditis
- Graves' disease
- Excessive iodine intake

ENDOCRINE DISEASE:
Thyroid gland disorders
HYPERTHYROIDISM

• Hyperthyroidism is defined as an overproduction of the thyroid hormones T3 and T4.
• This condition is most commonly caused by the development of Graves' disease, an autoimmune disease in which anomalous antibodies stimulate the thyroid to secrete excessive quantities of thyroid hormones.
• The disease can progress to the formation of a toxic goiter as a result of thyroid growth in response to a lack of negative feedback mechanisms.
# Thyroid Gland Disorders: Symptoms

<table>
<thead>
<tr>
<th>Hyperthyroidism</th>
<th>Hypothyroidism</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Nervousness</td>
<td>1. Fatigue</td>
</tr>
<tr>
<td>2. Anxiety</td>
<td>2. Cold intolerance</td>
</tr>
<tr>
<td>3. Hand tremors</td>
<td>3. Thin brittle hair or fingernails</td>
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<tr>
<td>4. Goiter</td>
<td>4. Weight gain, easily with normal diet</td>
</tr>
<tr>
<td>5. Weight loss, despite increased appetite</td>
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<tr>
<td>6. Heart palpitations</td>
<td>5. Weakness</td>
</tr>
<tr>
<td>8. Increased perspiration</td>
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</tr>
</tbody>
</table>
Eye symptoms:

- Exophthalmos (protrusion of the eyeball)
- Positive eye symptoms of Graeffe, Stellwag и Möbius
In hyperthyroid "stare" (Dalrymple sign) the eyelids are retracted upward more than normal (the normal position is at the superior corneoscleral limbus, where the "white" of the eye begins at the upper border of the iris)
Laboratory tests:

- Hormones count in blood
  - ↓ TSH
  - ↑ FT3 и FT4
- TAT and MAT
- Ultrasound
- Scintigraphy
DENTAL CONSIDERATIONS: HYPERthyroidism

Oral manifestations:

- Enlargement of extraglandular thyroid tissue (mainly in the lateral posterior tongue)
- Accelerated dental eruption
- Burning mouth syndrome
- Increased susceptibility to caries
- Periodontal disease
- Maxillary or mandibular osteoporosis
- Sjogren's syndrome
- Thyroid may be enlarged or noticeably palpable (Graves' disease)

Medications:

- anti-thyroid drugs- methimazole, propylthiouracil
- radioactive iodine
- beta-blocker and iodides
PATIENT MANAGEMENT: HYPERTHYROIDISM

Our role: Look out for signs and symptoms to aid in early diagnosis. If a suspicion of thyroid disease arises for an undiagnosed patient, all elective dental treatment to put on hold until full medical evaluation.

1. Brief and stress-free appointments

2. NO local anaesthetic with epinephrine and epinephrine impregnated cord for uncontrolled hyperthyroidism

3. Side effects: Propylthiouracil
   - agranulocytosis
   - Sialolith
   - prolonged bleeding due to warfarin

4. Susceptible to infections due to drug side effects

5. Dietary advice: Avoid iodized salt, seafood
TYPES AND CAUSES:

HYPOTHYROIDISM

1) CRETINISM (CONGENITAL)
- Iodine deficiency
- Defective or absent thyroid gland

2) MYXEDEMA (ACQUIRED)
- Hashimoto’s thyroiditis
- Treatment of overactive thyroid
- Severe iodine deficiency
- Pituitary gland disorder
- Long-term lithium intake
HYPOTHYROIDISM

- Fatigue
- Dry, coarse skin
- Feeling cold
- Cool extremities
- Poor memory and concentration
- Myxedema (mucopolysaccharide deposits in the skin and mucosa)
- Constipation, dyspepsia
- Hair loss
- Slow pulse rate
- Swelling of the limbs
- Delayed relaxation of tendon reflexes (Delayed relaxation after testing the ankle jerk reflex is a characteristic sign in hypothyroidism and is associated with the severity of the hormone deficit)
DENTAL CONSIDERATIONS: HYPOTHYROIDISM

Oral manifestations:
- Delayed dental eruption
- Salivary gland enlargement
- Macroglossia
- Glossitis (swollen tongue)
- Compromised periodontal health - delayed bone formation
- Dysgeusia (distortion of taste)
- Delayed wound healing

Medications: Synthroid, levothyroxine, armour thyroid
### SUMMARY

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<tr>
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<td>• Dysgeusia</td>
<td>• Maxillary and mandibular osteoporosis</td>
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<tr>
<td>• Delayed dental eruption</td>
<td>• Development of connective tissue diseases like Sjogren’s syndrome or Systemic lupus erythematosus</td>
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<tr>
<td>• Enamel hypoplasia in both dentitions, (being less intense in the permanent dentition)</td>
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<tr>
<td>• Anterior open bite</td>
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<tr>
<td>• Micrognathia</td>
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<tr>
<td>• Thick lips</td>
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<td>• Mouth breathing</td>
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Parathyroid glands

- small endocrine glands that produce parathyroid hormone (PTH)
- there are four parathyroid glands usually located behind the thyroid gland
- controls the amount of calcium in the blood and within the bones so that nervous & muscular systems can function properly

- PTH increases blood calcium levels by stimulating osteoclasts to break down bone, increasing resorption
- PTH increases gastrointestinal calcium absorption by activating Vitamin D
- PTH increases renal absorption of calcium by the kidneys
ENDOCRINE DISEASES: HYPERPARATHYROIDISM

- Overactivity of the parathyroid glands
- Excess production of PTH
- Raised PTH levels are harmful to bone
- Primary hyperparathyroidism / Secondary hyperparathyroidism
SYMPTOMS: HYPERPARATHYROIDISM

- Fragile bones that easily fracture
- Kidney stones
- Excessive urination
- Abdominal pain
- Tiring easily or weakness
- Depression or forgetfulness
- Bone and joint pain
- Frequent complaint of illness with no apparent cause
- Nausea, vomiting or loss of appetite
DENTAL CONSIDERATIONS: HYPERPARATHYROIDISM

1. Dental abnormalities
   - widened pulp chambers
   - development defects
   - alterations in dental eruption
   - weak teeth
   - malocclusions
   - loss of lamina dura on radiographs
   - giant cell lesions
DENTAL CONSIDERATIONS: HYPERPARATHYROIDISM

2. Brown tumor

3. Loss of bone density (bone resorption)

4. Soft tissue calcifications
- loss of the lamina dura surrounding the roots of the teeth
- decrease of trabecular density
- osseous lesions „brown tumor“
PATIENT MANAGEMENT: HYPERPARATHYROIDISM

• No special consideration
• Higher risk of bone fracture
  • Take precaution in surgical tx
• Recognize presence of brown tumor
• Perform correct differential diagnosis so as not to conduct an inadequate tx
ENDOCRINE DISEASES:
HYPOPARATHYROIDISM

- Decreased function of the parathyroid glands
- Underproduction of PTH
- Leads to low levels of calcium in the blood
- Can be inherited but is also encountered after thyroid or parathyroid surgery
SYMPTOMS: HYPOPARATHYROIDISM

- Tingling or burning (paresthesia) on fingertips, toes and lips
- Muscle aches or cramps affecting legs, feet, abdomen or face
- Twitching or spasms of muscles, particularly around mouth, hands, arms or throat
- Fatigue or weakness
- Dry, coarse skin
- Brittle nails
- Anxiety or nervousness
- Headaches
- Depression, mood swings
- Memory problems
DENTAL CONSIDERATIONS: HYPOPARATHYROIDISM

1. Dental abnormalities
   • Enamel hypoplasia in horizontal lines
   • poorly calcified dentine
   • widened pulp chambers
   • dental pulp calcifications
   • shortened roots
   • hypodontia
   • delay or cessation of dental development
DENTAL CONSIDERATIONS: HYPOPARATHYROIDISM

2. Mandibular tori
3. Chronic candidiasis
4. Parasthesia of the tongue or lips
5. Alteration in facial muscles
The **Chvostek sign** refers to an abnormal reaction to the stimulation of the facial nerve. When the facial nerve is tapped at the angle of the jaw (i.e. masseter muscle), the facial muscles on the same side of the face will contract momentarily.

**Trouseau sign** of latent tetany is a medical sign observed in patients with low calcium. It is generally believed to be more sensitive (94%) than the Chvostek sign (29%) for hypocalcemia. The sign is also known as *main d'accoucheur* (French - "hand of the obstetrician")
PATIENT MANAGEMENT: HYPOPARATHYROIDISM

- More susceptible to caries
  - Due to dental anomalies

- Dental management:
  - Prevention of caries with periodic reviews, advice regarding diet, OHI

- Before performing dental tx, find out serum calcium level (must be 8mg/100ml)
  - Prevents cardiac arrhythmias, seizures
Adrenal glands

- Fibrous capsule
- Zona glomerulosa
- Zona fasciculata
- Zona reticularis
- Cortex
- Medulla
- Central adrenomedullary vein
Adrenal hormones

The adrenal cortex produces a class of steroid hormones, the corticosteroids, which are classified according to their effects:

- **Mineralocorticoids**, produced in the zona glomerulosa, help in the regulation of blood pressure and electrolyte balance.
- **Glucocorticoids** such as cortisol, are synthesized in the zona fasciculata and their functions include regulation of glycogen and lipid metabolism and immune system suppression.
- The innermost layer of the cortex produces androgens (steroid hormones) that are converted to fully functional sex hormones in the gonads and other target organs.

The medulla produces the catecholamines, epinephrine, and norepinephrine which function to provoke a quick response on diverse organs in stress situations.
HYPERADRENOCORTICISM

Itsenko-Cushing syndrome (hyperadrenocorticism), is a collection of signs and symptoms due to prolonged exposure to cortisol. Signs and symptoms may include: high blood pressure, abdominal obesity but with thin arms and legs, reddish stretch marks, a round red face, a fat lump between the shoulders, weak muscles, weak bones, acne, and fragile skin that heals poorly. Women may have more hair and irregular menstruation. Occasionally there may be changes in mood, headaches, and a chronic feeling of tiredness.
Exogenous versus Endogenous

- The most common cause of Cushing's syndrome is exogenous administration of glucocorticoids prescribed to treat other diseases (called iatrogenic Cushing's syndrome).
- Endogenous Cushing's syndrome results from some derangement of the body's own system of secreting cortisol.
- Cushing's disease refers only to hypercortisolism secondary to excess production of ACTH from a pituitary adenoma (secondary hypercorticism).
The word "cushingoid" is a useful way to consider the complications and symptoms of Cushing's syndrome:

Cataracts, Ulcers, Skin (striae, thinning, bruising), Hypertension/ hirsutism/ hyperglycemia, Infections, Necrosis (avascular necrosis of the femoral head), Glycosuria, Osteoporosis/ obesity, Immunosuppression, and Diabetes
Hirsutism is the excessive hairiness on women in those parts of the body where terminal hair does not normally occur or is minimal.

Hirsutism can be caused by increased level of androgens.
Addison's disease (hypocortisolism)

- Addison’s disease (hypocortisolism) is a rare, chronic disorder in which the adrenal glands do not produce sufficient steroid hormones (glucocorticoids and often mineralocorticoids).
- It is characterised by a number of relatively nonspecific symptoms, such as abdominal pain and weakness, but under certain circumstances, these may progress to Addisonian crisis, a severe illness which may include very low blood pressure and coma.
- On physical examination, the following clinical signs may be noticed:[1]
  - Low blood pressure with or without orthostatic hypotension (blood pressure that decreases with standing); Syncope (loss of consciousness and ability to stand)
  - Hyperpigmentation of the skin, including areas not exposed to the sun. Characteristic sites of darkening are skin creases (e.g. of the hands), nipple, and the inside of the cheek (buccal mucosa); also, old scars may darken.
Morbus Addisoni
DD with other pigmented lesions

Presence of systemic symptoms!
The patients must be treated early in the morning! Why?
Treatment

- Treatment for Addison's disease involves replacing the missing cortisol, sometimes in the form of hydrocortisone tablets, or prednisone tablets in a dosing regimen that mimics the physiological concentrations of cortisol.

- Caution must be exercised when persons with Addison's disease become unwell with infection, have surgery or other trauma, or become pregnant. In such instances, their replacement glucocorticoids, whether in the form of hydrocortisone, prednisone, prednisolone, or other equivalent, often must be increased.

- Standard therapy for Addison's Crisis involves intravenous injections of glucocorticoids and large volumes of intravenous saline solution with dextrose (glucose). This treatment usually brings rapid improvement.
DIABETES MELLITUS
DIABETES MELLITUS

• High blood sugar, because pancreas does not produce enough insulin or cells do not respond to the insulin.

• Most common endocrine disease in Bulgaria

• Prevalence: 11.3% in 2013

• M>F
TYPES DIABETES MELLITUS

- **Type I Diabetes Mellitus**
  Juvenile diabetes (Insulin dependent)

- **Type II Diabetes Mellitus**
  Adult onset (Non-insulin dependent)

- **Third type**
  Gestational diabetes (pregnant women)
## RISK FACTORS: DIABETES MELLITUS

<table>
<thead>
<tr>
<th>TYPE 1</th>
<th>TYPE 2</th>
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<tbody>
<tr>
<td><strong>Genes</strong></td>
<td><strong>Age &gt; 45 years old</strong></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td><strong>Pre-diabetes (DM during prev. pregnancy)</strong></td>
</tr>
<tr>
<td><strong>Diet</strong></td>
<td><strong>Given birth to a baby &gt; 9 pounds</strong></td>
</tr>
<tr>
<td><strong>Chemicals and Drugs</strong></td>
<td><strong>Impaired glucose tolerance</strong></td>
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<tr>
<td></td>
<td><strong>Distribution of fats: Excess body weight (esp. around waist)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Family history of DM</strong></td>
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<tr>
<td></td>
<td><strong>Inactivity: Low activity level (exercising &lt; 3 times a week)</strong></td>
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</tbody>
</table>
SYMPTOMS

- Excessive thirst, urination and hunger (the three “P”)
- Sudden weight loss
- Increased fatigue
- Increased susceptibility to infections due to lowered immunity
- Other symptoms
Rubeosis diabetica

Eyelid xanthelasmas

Rubeosis diabetica

Lips cyanosis
Eyelid xanthelasmas
DENTAL CONSIDERATIONS:
DIABETES MELLITUS

- Oral manifestations
  - compromised periodontal health/worsen due to DM
  - candidosis (denture wearers)
  - dry mouth and sialosis-> increased caries
  - glossitis
  - burning mouth syndrome
  - oral, facial dysasthesia

- Poor response/healing to periodontal therapy
- Priority given to dental infections
DENTAL CONSIDERATIONS: DIABETES MELLITUS

- Enlarged salivary glands and xerostomia
- Increase susceptibility to periodontal disease
- More severe case of periodontal disease
- Poorer wound healing
Gumboil - periodontal abscess
Autoimmune comorbidity - vitiligo
HB1AC:
DIABETES MELLITUS

- Hemoglobin joins with glucose → HbA1C
- Glycosylated hemoglobin
- Measured 3-6 monthly to check if DM is under control
- Blood sample from vein or finder prick is needed to measure
- 6.5% is good for DM patient
- > 7% is not well controlled
PATIENT MANAGEMENT: DIABETES MELLITUS

First Diagnosis, Which type of DM?

Medical History

Hospitalisation history

Recent HbA1c Level

Frequency of Hypoglycemic control, blood test and medical check-up

Type of medications they are taking
PATIENT MANAGEMENT:  
DIABETES MELLITUS

- Scheduling dental visits:
  - Early morning, since their blood sugar level is higher at this time.
  - Regular dental visits

- Infection and wound healing:
  - Post-op antimicrobial or antibiotic therapy
  - Avoidance of smoking
Pregnancy and oral health
Oral Health as Part of Prenatal Care
Improving the Oral Health of a Pregnant Woman

1. Prevents complications of dental diseases during pregnancy
2. Has the potential to decrease early childhood caries
3. May reduce preterm and low birth weight deliveries
Changes During Pregnancy that Affect Oral Health

- Morning sickness
  - Difficulty with hygiene
    - Gum disease
    - Tooth decay
  - Vomiting

- Esophogeal Reflux (heartburn)

- Acid exposure
  - Irritation of the gums
  - Weakening of tooth enamel
  - Dental erosion
Nausea/vomiting: symptoms begin within the first or second month of pregnancy with the hormonal changes contributing somewhat to the gastrointestinal system and the stomach emptying a slightly more slowly under the influence of these hormones of pregnancy (Netwellness, 2010).

Morning sickness (MS) increases early recognition of pregnancy which helps to prevent damaging behaviours to the embryo such as smoking and drinking alcohol. (Kohl et al. 2009).

• MS stimulates placental growth (Huxley 2000).

• MS helps as emesis reduces the amounts of carbohydrates in the diet (Huxley 2000).

• The supported theories of MS represent both a protective role and a stimulating role for development. Therefore it can be seen that MS has a positive influence, however it is unpleasant and creates negative implications on the oral cavity.
Oral Implications of Morning Sickness:

During emesis hydrochloric acid is brought into the oral cavity from the stomach (Walsh 2006). The acid decreases the oral pH, once the pH falls below 5.5 the calcium hydroxyapatite (HA) crystals in enamel will demineralise.
Treatment for Acid Exposure

• Do NOT brush immediately after vomiting

• Rinse
  – Water with baking soda
  – Plain water

• Eat some cheese

• Ask about fluoride
Hormones of Pregnancy

• Hormonal Affects

The physiological and emotional changes which occur during pregnancy are largely attributed to the hormones of pregnancy. These hormones initiate and regulate the stages of prenatal development and are essential for the growth of the developing child. There are a number of hormones involved in pregnancy but the significant ones that will be discussed include:

- human chorionic gonadotropin (hCG)
- progesterone
- estrogen
- relaxin
- human chorionic somatomammotropin (hCS) or human placental lactogen (hPL)
- corticotrophin-releasing hormone (CRH)
Changes During Pregnancy that Affect Oral Health

- Hormonal Affects
  - Increased tooth mobility
  - Saliva changes
  - Increased bacteria
  - Gum problems

Hormone Levels during Pregnancy (Tortora & Derrickson 2009)
Saliva changes

• Decreased buffers
• Decreased minerals
• Decreasing flow first and last trimester
• Increased flow second trimester
• More acidic
Increased salivary flow (second trimester)
Increased Bacteria

- Increased acidity
  - Increase in decay-causing bacteria
- Increased Snacking
  - Morning sickness/low blood sugar
  - Between-meal snacks
- Increase in amount and frequency of starches/carbohydrates
  - Promotes decay-causing bacteria
Increased Bacteria

• Increased food supply
• Increased hormones
  – Gingival fluid and saliva contain hormones
  – Cause gums to swell, bleed easily, and secrete more fluid
  – Bacteria use hormones for energy to grow and multiply
• Decreased immune response limits ability to fight bacteria
Pregnancy Gingivitis

This is a condition that is related to elevated hormone levels between the second month of gestation correlating with the elevation of the hormones estrogen and progesterone. Carillo-de-Albornoz A et al. (2010) state that unlike "regular" gingivitis, Pregnancy gingivitis relates to increased levels and adherence of bacteria and plaque in the mouth, pregnancy gingivitis DOES NOT. The cell mediated immune response is depressed during pregnancy progesterone increases exudation levels and compromises endothelial cells.
The clinical appearance of pregnancy gingivitis is the enlargement of the gingiva and it is usually limited to the interdental papillae.
Gum Problems

• Pregnancy Gingivitis
  – Red edges
  – Swollen or puffy
  – Tender
  – Bleed easily during brushing
Pregnancy Granuloma (*epulis gravidarum*)

Clinical appearance:
- red
- mulberry like surface
- bleeds with slight probing
- It is supported on a stalk
- white covered areas
• This condition as a hyperplastic lesion that bleeds and grows profusely.

• It will usually appear during the second trimester as a result of irritation. The increased hormone levels during pregnancy cause an exacerbated tissue response and possibly mobility of dentition that is in close proximity.

• This condition also and states it is no cause for alarm and will usually disappear after birth or need to be lanced.
Surgical excisionepulis gravidarum
Oral Diseases Can Effect Pregnancy

- Preterm, low birth weight (LBW) linked to periodontal disease
- Thorough calculus removal in pregnant women with periodontitis may reduce pre-term births
The bacteria associated with periodontal disease are capable of stimulating excessive production of cytokines and prostaglandins – initiating preterm labor and delivery.
Spontaneous preterm birth in pregnant women with gum disease

• The **third trimester** is usually an uncomfortable stage for the pregnant patient particularly being supine in the dental chair.

• According to Mason (1988), lying the patient down in the supine position at this late stage of pregnancy may cause "**Supine Hypertensive Syndrome**".
"Supine Hypertensive Syndrome" resulted in symptoms such as an abrupt fall in blood pressure, a slow and or irregular heart rate, sweating and a generally unwell feeling.

Hunter & Hunter (1997) describe this as a result of "impaired venous return to the heart resulting from compression of inferior vena cava by the uterus".
To prevent "Supine Hypertensive Syndrome" the patient should follow the postions seen below. Treatment during this stage should be limited to emergencies only for this reason and also as there is a risk of early term labour.
Guidelines for Health Care Professionals

• Advise that dental care is safe and effective during pregnancy
• Can be done any time during pregnancy with no additional risk as compared to not providing care
• Don’t delay treatment
Radiographs

• The use of radiographs as a diagnostic tool is at times a necessity.

• Hunter and Hunter (1997) believe that there is the view that any radiation exposure to an unborn foetus is a good thing to avoid.

• However, also states that “there has been no increase in congenital abnormalities or intrauterine growth retardation as a result of exposures totalling 5-10 Gray's during pregnancy."

• The National Health and Medical Research Council further support the diagnostic use of radiographs stating "where necessary for assessment or diagnosis of infection or trauma OR for treatment of these conditions, there is no reason on radiation protection grounds to defer dental radiographs during pregnancy."
Safe Dental Treatment

• Most treatments considered safe
• Diagnostic x-rays can be used during pregnancy
• Xylocaine with epinephrine can be used during pregnancy
• Chlorhexidine rinse
<table>
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<th>Drugs that can be prescribed during pregnancy</th>
<th>Drugs that are Contraindicated during pregnancy</th>
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<tr>
<td><strong>Antibiotics:</strong> Penicillin, Cephalosporin, Amoxicillin, Clindamycin, Erythromycin (except estole form)</td>
<td>Tetracycline, Doxycyclines, Chloramphenicol</td>
</tr>
<tr>
<td><strong>Analgesics:</strong> Acetaminophen</td>
<td>Aspirin, Ibuprofen</td>
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Tetracycline staining of the teeth
### Oral manifestations of endocrine disorders - summary

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<th>Oral manifestations</th>
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<td>Microdontia, Retarded tooth eruption</td>
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<td>Gigantism/acromegaly</td>
<td>Spaced teeth, Mandibular prognathism, Macroglossia</td>
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<td>Congenital hypothyroidism</td>
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<td>Bone rarefaction, Brown tumours</td>
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<tr>
<td>Addison’s disease</td>
<td>Mucosal hyperpigmentation</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Periodontal disease, Xerostomia, Candidiasis, Sialosis, Lichen planus</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Gingivitis, Epulis</td>
</tr>
</tbody>
</table>
Oral manifestations of liver diseases
OVERVIEW

- Liver
- Common liver Diseases
- Risk factors
- Signs and symptoms
- Dental Management & Considerations
## Oral manifestations of liver diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcoholic cirrhosis</td>
<td>Bleeding tendency, Sialosis</td>
</tr>
<tr>
<td>Chronic active hepatitis</td>
<td>Lichen planus</td>
</tr>
<tr>
<td>Primary biliary cirrhosis</td>
<td>Sjögren’s syndrome, Lichen planus</td>
</tr>
<tr>
<td>Hepatitis C</td>
<td>Lichen planus, Sjogren’s syndrome</td>
</tr>
</tbody>
</table>
Oral manifestations of gastrointestinal diseases
OVERVIEW

• Gastrointestinal System
• Common gastrointestinal Diseases
• Risk factors
• Signs and symptoms
• Dental Management & Considerations
## Oral manifestations of gastrointestinal diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pernicious anaemia</td>
<td>Ulcers, Glossitis, Angular stomatitis, Erythema</td>
</tr>
<tr>
<td>Any malabsorption</td>
<td>Ulcers, Glossitis, Angular stomatitis</td>
</tr>
<tr>
<td>Chronic regurgitation</td>
<td>Tooth erosion, Halitosis</td>
</tr>
<tr>
<td>Crohn’s disease</td>
<td>Mucosal tags, Gingival hyperplasia, Cobblestoning of mucosa, Ulcers, Glossitis, Angular stomatitis</td>
</tr>
<tr>
<td>Coeliac disease</td>
<td>Ulcers, Glossitis, Angular stomatitis, Dental hypoplasia</td>
</tr>
<tr>
<td>Chronic pancreatitis</td>
<td>Sialosis</td>
</tr>
<tr>
<td>Cystic fibrosis</td>
<td>Salivary gland swelling</td>
</tr>
<tr>
<td>Gardner’s syndrome (familial colonic polyposis)</td>
<td>Osteomas</td>
</tr>
</tbody>
</table>
• **Crohn disease**
  – diffuse labial, gingival or mucosal swelling
  – „cobblestoning“ of buccal mucosa and gingiva
  – aphtous ulcers
  – mucosal tags
  – angular cheilitis
  – oral granulomas

• **Ulcerative colitis**
  – oral signs are present in periods of exacerbation of disease
  – aphtous ulceration or superficial hemorrhagic ulcers
  – angular stomatitis
  – pyostomatitis vegetans, pyostomatitis gangrenosum
• **Gastroesophageal reflux**
  
  – reduction of the pH of the oral cavity below 5.5
  – enamel damage
  – damage of the dentin – higher sensitivity (to temperature..), caries

• **Chronic liver diseases**
  
  – jaundice
  – petechiae or gingival bleeding (hemostasis disorder)
Oral manifestations of renal diseases
OVERVIEW

• Renal System
• Common Renal Diseases
• Risk factors
• Signs and symptoms
• Dental Management & Considerations
### Oral manifestations of renal diseases

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Chronic renal failure</strong></td>
<td>Xerostomia, Halitosis/taste disturbance, Leukoplakia</td>
</tr>
<tr>
<td></td>
<td>Dental hypoplasia, Bleeding tendency</td>
</tr>
<tr>
<td><strong>Post renal transplant</strong></td>
<td>Infections( herpetic, candidal), Bleeding tendency,</td>
</tr>
<tr>
<td></td>
<td>Gingival hyperplasia, Kaposi’s sarcoma</td>
</tr>
<tr>
<td></td>
<td>Hairy leukoplakia</td>
</tr>
<tr>
<td><strong>Renal rickets</strong></td>
<td>Delayed tooth eruption, Dental hypoplasia, Enlarged pulp</td>
</tr>
<tr>
<td>(vitamin D resistant)</td>
<td></td>
</tr>
<tr>
<td><strong>Nephrotic syndrome</strong></td>
<td>Dental hypoplasia</td>
</tr>
</tbody>
</table>
Dental hypoplasia
Uremic stomatitis
Uremic stomatitis

- rare
- in undiagnosed and untreated chronic renal failure
- irritation and chemical injury of mucosa by ammonia or ammonium compounds

Signs:
- painful plagues and crusts – bucal mucosa, the floor or dosrum of the tongue, floor of the mouth

- Type I
  - generalized or localized erythema
  - exudate
  - pain, burning, xerostomia, halitosis, gingival bleeding, candidiosis

- Type II
  - ulceration
  - secondary infection
  - anemia
Renal osteodystrophy
Renal osteodystrophy
Gingival hyperplasia due to Ciclosporine A in transplanted patients.

Treatment is only surgical.
Oral manifestations hematological diseases
OVERVIEW

• Common Hematological Diseases
• Risk factors
• Signs and symptoms
• Dental Management & Considerations
## Oral manifestations haematological diseases

<table>
<thead>
<tr>
<th>Disease</th>
<th>Oral Manifestations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency of haematinics (iron, folic acid or vitamin B12)</td>
<td>Burning sensation, Ulcers, Glossitis, Angular stomatitis</td>
</tr>
<tr>
<td>Sickle-cell anaemia</td>
<td>Jaw deformities, Osteomyelitis</td>
</tr>
<tr>
<td>Aplastic anaemia</td>
<td>Ulcers, Bleeding tendency</td>
</tr>
<tr>
<td>Leukaemia/lymphoma</td>
<td>Infections, Ulcers, Bleeding tendency, purpura, Gingival swelling</td>
</tr>
<tr>
<td>Multiple myeloma</td>
<td>Bone pain, Tooth mobility, Amyloidosis</td>
</tr>
<tr>
<td>Amyloid disease</td>
<td>Enlarged tongue, Purpura</td>
</tr>
</tbody>
</table>
Hematologic diseases

- **Anemias**
  - folate and vit. B12 deficiency
  - iron deficiency
  - glossitis
    - red colour
    - athrophic papilae
    - recurrent aphthae
  - candidal infection
  - angular stomatitis
  - oral pain
Hematologic diseases

• **Leukemia**
  
  – gingival hypertrophy
  – petechiae
  – mucosal ulcers
  – hemorrhage
Summary of oral manifestations of gastrointestinal and hematologic diseases

Angular cheilitis
• Iron-deficiency anemia

Hemorrhage
• Pyostomatitis vegetans
• Scurvy
• Ulcerative colitis

Aphthous ulcers
• Crohn's disease
• Pernicious anemia
• Ulcerative colitis

Intraoral burning
• Iron-deficiency anemia
• Pernicious anemia

Candidiasis
• Crohn's disease (steroid therapy)
• Iron-deficiency anemia
• Pyostomatitis vegetans (steroid therapy)
• Ulcerative colitis (steroid therapy)
Summary of oral manifestations of gastrointestinal and hematologic diseases

Labial swelling
• Crohn's disease

Erosion of enamel and dentin
• Anorexia nervosa/bulimia
• Gastroesophageal reflux

Gingivitis
• Anorexia nervosa/bulimia
• Crohn's disease
• Scurvy

Glossitis
• Crohn's disease
• Iron-deficiency anemia
• Pernicious anemia
• Ulcerative colitis

Ulcerations and erosions
• Crohn's disease
• Iron-deficiency anemia
• Pernicious anemia
• Pyostomatitis vegetans
• Ulcerative colitis
Connective-tissue diseases

• **Sjögren syndrome**
  – autoimmune disease
  – men : women - 1 : 9, 50 years and older

Main signs
  – sicca syndrome
  – keratoconjunctivitis sicca
  – xerostomia

Oral signs
  – decrease in saliva
    • xerostomia
      – dry, red, wrinkled mucosa
    • difficulty in swallowing and eating
    • disturbance in taste and speech
    • increased dental caries
    • infections
    • atrophy of the papilae
    • candidiasis
Connective-tissue diseases

• Sclerodermia
  – diffuse sclerosis of the skin, GIT, heart muscle, lungs, kidney

Oral signs
  – pursed lips – difficult to open the mouth
  – esophageal sclerosis → gastroesophageal reflux – damage of enamel
  – pale, rigid mucosa
  – teleangiectasias
  – decreased mobility of tongue
  – salivary hypofunction

Limited mouth opening and decreased tongue mobility

Gingival retraction
Connective-tissue diseases

• **Lupus erythematosus**
  – autoimmune disease

Oral signs

– ulcerations
– oral lesions of lichen planus – painful
– petechiae
– damage of salivary glands - xerostomia

ulcer

lichen planus lesions
Pulmonary diseases

- **Cystic fibrosis**
  
  Oral signs
  - disorder of salivary glands
  - swelling lips
  - gingivitis
  - dryness
Pulmonary diseases

• **Sarcoidosis**
  
  Oral signs
  
  – multiple, nodular, painless ulcerations of the gingiva, bucal mucosa, labial mucosa and palate
  
  – tumorlike swelling of salivary glans
  
  – swelling of the tongue
  
  – xerostomia
  
  – facial nerve palsy