Disease/Medical Condition

HYPOTHYROIDISM

(also known as “underactive thyroid disease”; includes congenital hypothyroidism [also known as “neonatal hypothyroidism”] and Hashimoto’s thyroiditis [also known as “autoimmune thyroiditis”]; may manifest as “cretinism” [if onsets during fetal or early life; also known as “congenital myxedema”] or “myxedema” [if onset occurs in older children and adults])

Date of Publication: January 27, 2017

**Is the initiation of non-invasive dental hygiene procedures* contra-indicated?** No

■ Is medical consult advised? Yes, if previously undiagnosed hypothyroidism or enlarged (or shrunken) thyroid gland is suspected¹, in which case the patient/client should see his/her primary care physician. Detection early in childhood can prevent permanent intellectual impairment.

■ Yes, if previously diagnosed hypothyroidism is suspected to be under medicated (with manifest signs/symptoms of hypothyroidism) or overmedicated (with manifest signs/symptoms of hyperthyroidism²), in which case the patient/client should see his/her primary care physician or endocrinologist. Major stress or illness sometimes necessitates an increase in prescribed thyroid hormone.

**Is the initiation of invasive dental hygiene procedures contra-indicated?** Possibly, depending on the certainty of diagnosis and level of control.

■ Is medical consult advised? See above.

■ Is medical clearance required? Yes, if undiagnosed or severe hypothyroidism is suspected.

■ Is antibiotic prophylaxis required? No, in the absence of cardiac valvular pathology or atrial fibrillation.

■ Is postponing treatment advised? Yes, if undiagnosed hypothyroidism is suspected (necessitating medical assessment/management) or severe hypothyroidism is suspected (necessitating urgent medical assessment/management in order to avoid risk of myxedema coma). In general, the patient/client with mild symptoms of untreated hypothyroidism is not in danger when receiving dental hygiene therapy, and the well managed (euthyroid) patient/client requires no special regard.

**Oral management implications**

■ Palpation of the thyroid gland should be part of the head and neck examination by the dental hygienist. Diffuse enlargement or nodules may be detected.

■ Stress should be minimized by keeping appointments brief for non-euthyroid patients/clients.

■ Lethargy in hypothyroid patients/clients can lead to possible aspiration of dental/dental hygiene materials and/or lowering of respiratory rate when in the dental chair.

■ Patients/clients with untreated hypothyroidism are very sensitive to the actions of central nervous system depressants, including narcotic analgesics and sedatives/tranquillizers (e.g., benzodiazepines and barbiturates). These drugs should be avoided in all patients/clients with severe hypothyroidism and used sparingly (reduced dosage), if at all, in persons with mild hypothyroidism.

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¹ Diagnostic tests for hypothyroidism include serum measurement of thyroid stimulating hormone (TSH; also known as thyrotropin), thyroid hormone (usually free T₄), and, less commonly, administration of radioactive iodine to measure uptake by the thyroid gland (RAIU). Medical management involves administration of synthetic preparations of thyroid hormone (usually levothyroxine or T₄), typically orally but occasionally parenterally in severe cases.

² Signs/symptoms of increased thyroid activity include palpitations, sweating, restlessness, shakiness, and weight loss.
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Oral management implications (cont’d)

- Certain medications may decrease absorption of orally administered thyroid replacement drugs. These include fluoroquinolone antibiotics\(^3\); antacids\(^4\); calcium supplements; iron supplements\(^5\); laxatives; cholesterol lowering drugs\(^6\); phosphate binders (used in chronic kidney disease); sucralfate (used in gastroesophageal reflux disease and peptic ulcer disease); and raloxifene\(^7\). 
- Certain drugs used to manage epilepsy, including carbamazepine, phenytoin, and phenobarbital increase metabolism of thyroid replacement drugs. 
- Long-standing hypothyroidism may result in increased bleeding from infiltrated tissues\(^8\), resulting in a need for extended application of local pressure for hemostasis. 
- Myxedema coma – a medical emergency – may be precipitated by trauma, infections, surgical procedures, and cold in untreated or suboptimally treated patients/clients with severe hypothyroidism. 
- Once the hypothyroid patient/client receives ongoing appropriate medical care, no particular problems in terms of oral management remain, except for possibly the need to address malocclusion and/or enlarged tongue.

Oral manifestations

- Manifestations of cretinism include thickened lips, macroglossia (enlarged tongue), protruding tongue, delayed eruption of teeth, and malocclusions. 
- In older children and adults, hypothyroidism may result in macroglossia, dysgeusia (altered taste), hypogeusia (decreased taste), glossitis, salivary gland enlargement, and facial swelling. 
- Depending on the timing and severity of hypothyroidism, other manifestations include enamel hypoplasia in both dentitions, anterior open bite, impaction of the mandibular second molars (due to abnormalities of craniofacial growth and dental development), weakened oral and facial bones, swollen gums, and mouth breathing. 
- Poor periodontal health and delayed wound healing are common.

Related signs and symptoms

- Hypothyroidism occurs when the thyroid gland produces insufficient amounts of thyroid hormone\(^10\). Causes of primary hypothyroidism (intrathyroid defect) include congenital/developmental conditions (i.e., in persons born without a thyroid gland or a poorly functioning one); autoimmune destruction of the thyroid gland (e.g., Hashimoto’s thyroiditis\(^11\) and end-stage Graves’ disease); infiltrative destruction of the thyroid gland (e.g., amyloidosis, lymphoma, and scleroderma); iodine deficiency; medications (e.g., lithium and antithyroidal thioamide drugs such as carbimazole, methimazole, and...
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Related signs and symptoms

Propylthioracil); and treatments for hyperthyroidism or thyroid cancer (including surgical thyroidectomy, radioactive iodine therapy, and external beam radiation to thyroid gland). Secondary hypothyroidism results from certain disorders of the pituitary gland and hypothalamus.

More common than hyperthyroidism, hypothyroidism affects about 2% of the population, and prevalence increases with age, with mean age of diagnosis being 60 years. Both developmental and autoimmune hypothyroidism are more common in females than males. Subclinical hypothyroidism is diagnosed in 6% to 8% of women and 3% of men.

Congenital hypothyroidism (CH) occurs in about 1 in 4000 newborns. In Ontario and Canada (and many other developed jurisdictions), newborns are routinely screened for CH so that cretinism can be prevented with timely intervention.

Cretinism (rare in Canada) is characterized by dwarfism; excess weight; typical facial features such as broad and flat nose and wide-set eyes; protuberant tongue; pale skin; poor muscle tone and muscle weakness; stubby hands; delayed bone age and skeletal dystrophy; hoarse cry; umbilical hernia; thick, dry skin; alopecia (hair loss); poor vision; lethargy; and intellectual disability.

With onset of hypothyroidism in older children and adults, myxedematous features include: a dull expression; puffy eyelids and facial appearance; dry, brittle, and coarse hair; alopecia (hair loss) of the outer third of the eyebrows; dry, scaly, cool, and pale skin; accumulation of subcutaneous fluid (nonpitting edema referred to as myxedema); yellowing of the palms; and brittle nails.

In adults, the onset of hypothyroidism is usually insidious. Manifestations over time include weight gain despite decreased appetite; constipation; slowing of physical and mental activity (including poor memory retention, as well as myxedema dementia in severe cases); croaky, hoarse, and slurred speech; anemia; cold intolerance; increased capillary fragility; muscle cramps and weakness; slow reflexes; hypotension; bradycardia (abnormally slow heart rate); decreased respiratory rate; cardiomegaly (abnormally enlarged heart); paresthesia; headache; fatigue; sleepiness; and depression. In females, menstrual irregularities occur – varying from menorrhagia (abnormally heavy menstrual bleeding) to amenorrhea (abnormal absence of periods) – and fertility may be impaired.

Depending on the underlying cause of hypothyroidism, the size of the thyroid gland can be normal, increased (goitre), or decreased.

In untreated patients/clients with severe hypothyroidism, myxedema coma may result, which can lead to death. Myxedema coma is characterized by hypothermia, hypoventilation (with associated hypercapnia, or excessive carbon dioxide in the blood), bradycardia (slow heart rate), cardiac arrhythmias, hypotension, and epileptic seizures. It occurs most often in elderly persons during winter months and, while rare, carries a mortality rate of up to 50%.

The slowing of metabolism over time, if untreated, is associated with cardiovascular disease (from arteriosclerosis and elevated low-density lipoprotein [LDL] cholesterol), obesity, and joint pain.

12 Under normal circumstances, thyrotropin-releasing hormone (TRH) is released by the hypothalamus in response to external stimuli (e.g., metabolic demand and low levels of thyroid hormone). TRH in turn stimulates the pituitary to release thyroid-stimulating hormone (TSH), which causes the thyroid gland to secrete T4 and T3.

13 Goitre is generalized enlargement of the thyroid gland, and may be either diffuse or nodular. It is found in some causes of hypothyroidism, such as Hashimoto’s thyroiditis and chronic fibrosing [Riedel’s] thyroiditis.

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References and sources of more detailed information

- CDHO Knowledge Network Advisory
  http://www.cdho.org/Advisories/CDHO_Advisory_Hypothyroidism.pdf

- Thyroid Foundation of Canada
  http://www.thyroid.ca/hypothyroidism.php
  http://www.thyroid.ca/thyroiditis.php
  http://www.thyroid.ca/pregnancy_fertility.php
  http://www.thyroid.ca/childhood.php
  http://www.thyroid.ca/surgical_treatment.php
  http://www.thyroid.ca/thyroid_cancer.php
  http://www.thyroid.ca/Thyroid%20Function%20in%20Health%20and%20Psychiatric%20Disorders.pdf

- Newborn Screening Ontario
  https://www.newbornscreening.on.ca/en/disease

- RDH Magazine, Dentistry IQ Network


* Includes oral hygiene instruction, fitting a mouth guard, taking an impression, etc.

** Ontario Regulation 501/07 made under the Dental Hygiene Act, 1991. Invasive dental hygiene procedures are scaling teeth and root planing, including curetting surrounding tissue.

Date: October 10, 2016