### ADVISORY TITLE

Use of the dental hygiene interventions of scaling of teeth and root planing including curetting surrounding tissue, orthodontic and restorative practices, and other invasive interventions for persons with disorders of the adrenal gland.

### ADVISORY STATUS

Cite as: 
*College of Dental Hygienists of Ontario, CDHO Advisory Disorders of the Adrenal Gland, 2019-10-30*

### INTERVENTIONS AND PRACTICES CONSIDERED

Scaling of teeth and root planing including curetting surrounding tissue, orthodontic and restorative practices, and other invasive interventions (“the Procedures”).

### SCOPE

#### DISEASE/CONDITION(S)/PROCEDURE(S)

**Disorders of the adrenal gland**

### INTENDED USERS

- Advanced practice nurses
- Dental assistants
- Dental hygienists
- Dentists
- Denturists
- Dieticians
- Health professional students
- Nurses
- Patients/clients
- Pharmacists
- Physicians
- Public health departments
- Regulatory bodies

### ADVISORY OBJECTIVE(S)

To guide dental hygienists at the point of care relative to the use of the Procedures for persons who have disorders of the adrenal gland, chiefly as follows.

1. Understanding the medical condition.
2. Sourcing medications information.
3. Taking the medical and medications history.
4. Identifying and contacting the most appropriate healthcare provider(s) for medical advice.

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1 Persons includes young persons and children
5. Understanding and taking appropriate precautions prior to and during the Procedures proposed.
6. Deciding when and when not to proceed with the Procedures proposed.
7. Dealing with adverse events arising during the Procedures.
8. Record keeping.

TARGET POPULATION

Child (2 to 12 years)
Adolescent (13 to 18 years)
Adult (19 to 44 years)
Middle Age (45 to 64 years)
Aged (65 to 79 years)
Aged 80 and over
Male
Female

Parents, guardians, and family caregivers of children, young persons and adults with disorders of the adrenal gland.

MAJOR OUTCOMES CONSIDERED

For persons who have disorders of the adrenal gland: to maximize health benefits and minimize adverse effects by promoting the performance of the Procedures at the right time with the appropriate precautions, and by discouraging the performance of the Procedures at the wrong time or in the absence of appropriate precautions.

RECOMMENDATIONS

UNDERSTANDING THE MEDICAL CONDITION

Terminology used in this Advisory

Resources consulted

- Adrenal Crisis in Emergency Medicine, Medscape
- Adrenal Gland Disorders, NIH MedlinePlus
- Adrenal Gland Disorders, NIH National Institute of Child Health and Human Development
- Adrenal Insufficiency and Addison’s Disease, National Institute of Diabetes and Digestive and Kidney Diseases
- Androgen Excess, Medscape
- Congenital Adrenal Hyperplasia, Medscape
- Cushing’s Syndrome, Merck Manuals
- Cushing’s Syndrome, NIH National Institute of Child Health and Human Development
- Functions of the Adrenal Steroid Hormones, The Medical Biochemistry Page
- Hyperaldosteronism, Merck Manuals
- Hyperaldosteronism, Primary, Medscape
- Pheochromocytoma, Merck Manuals
- The Hormone Foundation, Pituitary Disorders Overview
Disorders of the adrenal gland chiefly comprise

1. **Addison’s disease**
2. **Congenital adrenal hyperplasia**
3. **Cushing’s disease**
4. **Cushing’s syndrome**
5. **Hyperaldosteronism**
6. **Pheochromocytoma**
7. **Virilization**

1. Adenoma, a benign tumor in glands.
2. Addisonian crisis, a severe, acute and potentially life-threatening condition that occurs when the adrenal glands fail to produce sufficient cortisol.
3. Addison's disease is
   a. a disorder that occurs when the adrenal glands do not produce enough of their hormones
   b. also called
      i. adrenal insufficiency
      ii. adrenocortical hypofunction
      iii. chronic adrenocortical insufficiency
      iv. primary adrenal insufficiency.
4. Adrenal glands, also called the suprarenal glands, which
   a. are situated at the top of the kidneys
   b. are responsible for
      i. maintaining metabolic processes, such as
         1. managing blood sugar levels
         2. regulating inflammation
      ii. regulating the balance of salt and water
      iii. controlling the “fight-or-flight” response to stress
      iv. maintaining pregnancy
      v. initiating and controlling sexual maturation during childhood and puberty
   c. comprise two parts, each with different functions
      i. outer, the adrenal cortex, which secretes corticosteroid hormones
      ii. inner, the adrenal medulla, which
         1. is not essential to life
         2. helps in combating physical and emotional stress
         3. secretes
            a. epinephrine (adrenaline), which
               i. increases the
                  1. heart rate
                  2. force of heart contractions
               ii. facilitates blood flow to the muscles and brain
               iii. relaxes smooth muscles
               iv. helps conversion of glycogen to glucose in the liver, and other activities
            b. norepinephrine (noradrenaline), which
               i. is strongly vasoconstrictive
               ii. increases blood pressure
   d. work with the hypothalamus, which
i. normally triggers the adrenal glands to release cortisol into the bloodstream in the right amount for the body's needs
ii. may cause the adrenal glands to produce excess cortisol when there are problems with the
   1. adrenal glands
   2. pituitary gland, which may cause it to over-stimulate the adrenal glands, setting up a harmful feedback loop
   3. the hypothalamus itself.

5. Adrenal hyperplasia, adrenal enlargement, of which the most common cause is Cushing’s syndrome, also occurs as congenital adrenal hyperplasia.

6. Adrenal insufficiency, when the adrenal glands do not produce enough of certain hormones
   a. primary adrenal insufficiency describes the cause of Addison’s disease
   b. secondary adrenal insufficiency occurs when the pituitary gland fails to produce enough adrenocorticotropin.

7. Adrenocorticotropin (ACTH), a hormone that stimulates the adrenal glands to produce cortisol.

8. Aldosterone, a mineralocorticoid hormone that
   a. is produced in the adrenal cortex in response to low salt levels
   b. regulates the balance of salt and water in the body.

9. Androgens, hormones associated with masculine characteristics, which
   a. are produced in
      i. males, from the testes
      ii. females, primarily from the adrenal glands and the ovaries
   b. in excess are responsible for the most common endocrine disorder in women of reproductive age, with various clinical features such as
      i. acne
      ii. hirsutism
      iii. reproductive dysfunction
      iv. virilization.

10. Catecholamines, powerful hormones that
    a. induce high blood pressure
    b. include
       i. dopamine
       ii. epinephrine (adrenaline)
       iii. norepinephrine (noradrenaline)

11. Congenital adrenal hyperplasia, a genetic disorder resulting in adrenal gland deficiency, in which the body
    a. produces insufficient cortisol
    b. may be affected by other hormone imbalances, such as
       i. insufficient aldosterone
       ii. excess androgens.

12. Corticosteroids, hormones that are chemically classed as steroids, which may be synthesized in the laboratory, and which include
    a. glucocorticoid hormones, such as cortisol, which
       i. maintain glucose control
       ii. suppress the immune response
       iii. help the body respond to stress
b. mineralocorticoid hormones, such as aldosterone, which regulate
   i. sodium balance
   ii. potassium balance

c. sex hormones, affecting sexual development and sex drive, called
   i. androgens
   ii. estrogens

13. Cushing’s disease, a form of Cushing’s syndrome, in which
   a. the pituitary gland releases too much adrenocorticotropic, leading to
      overproduction of cortisol by the adrenal cortex
   b. the pituitary gland usually has a small adenoma.

14. Cushing’s syndrome, a condition which
   a. results from excess of cortisol
   b. displays the clinical picture resulting from cortisol excess from any cause.

15. Estrogens, are
   a. produced in
      i. women, mainly in the ovaries, in the placenta during pregnancy and in the
         adrenals
      ii. in men, by the adrenal glands and testes
      iii. in both sexes by many tissues in the body, especially fat and muscle
   b. responsible for female sexual development and function, such as breast
      development and the menstrual cycle.

16. Glucocorticoids, hormones such as cortisol, which
   a. control inflammation
   b. govern the metabolism of carbohydrates and, to a lesser extent, fats and
      proteins
   c. are produced in the adrenal cortex or are manufactured chemically in the
      laboratory.

17. Hyperaldosteronism, overproduction of aldosterone which leads to fluid retention and
    increased blood pressure, weakness, and, rarely, periods of paralysis.

18. Hypothalamus, a region of the brain that controls numerous bodily functions.

19. Incidence, the total of new cases of an illness diagnosed during a specific time period.

20. Pheochromocytoma, a tumour that
   a. usually originates in the adrenal glands
   b. causes overproduction of catecholamines.

21. Pituitary gland, the size of a pea, the master gland of the body that
   a. is situated at the base of the brain
   b. produces hormones that stimulate other glands, including the adrenal glands, to
      produce various other hormones
   c. controls biochemical processes important to well-being.

22. Pituitary tumours, benign, which may
   a. restrict the release of hormones from the pituitary gland
   b. reduce
      i. the adrenal gland’s release of hormones needed for the “fight-or-flight”
         response to stress
      ii. the body’s ability to handle physiological stress resulting in Addison’s
          disease, which can be fatal
   c. lead to a form of Cushing’s syndrome called Cushing’s disease.

23. Prevalence, the number of people currently with an illness in a given year.

24. Thrush, also termed oral candidiasis or oral moniliasis, is
25. Virilization, the development of exaggerated masculine characteristics, usually in women, often as a result of the adrenal glands overproducing androgens.

Overview of disorders of the adrenal gland

**Resources consulted**
- Adrenal Crisis in Emergency Medicine, Medscape
- Adrenal Gland Disorders, NIH MedlinePlus
- Adrenal Gland Disorders, NIH National Institute of Child Health and Human Development
- Adrenal Insufficiency and Addison’s Disease, National Institute of Diabetes and Digestive and Kidney Diseases
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- The Hormone Foundation, Pituitary Disorders Overview

1. Addison’s disease
   a. results from damage to the adrenal cortex, which
      i. causes the cortex to produce less of its hormones
      ii. may be caused by
         1. autoimmune diseases, which may result from genetic defects, such as
            a. chronic thyroiditis (CDHO Advisory)
            b. dermatis herpetiformis
            c. Graves’ disease (CDHO Advisory)
            d. hypoparathyroidism
            e. hypopituitarism
            f. myasthenia gravis
            g. pernicious anemia (CDHO Advisory)
            h. testicular dysfunction
            i. type I diabetes (CDHO Advisory)
            j. vitiligo
         2. infections such as
            a. tuberculosis (CDHO Advisory)
            b. HIV (CDHO Advisory)
            c. thrush and other fungal infections
   3. hemorrhage
   4. tumours
   5. anticoagulants
   b. may produce a severe, potentially life-threatening acute state, the Addisonian crisis, which
      i. is characterized by
1. dehydration
2. loss of consciousness
3. low blood pressure
4. severe vomiting and diarrhea
5. sudden, penetrating pain in the lower back, abdomen, or legs

ii. may be the first indication of Addison’s disease

c. produces in the chronic state gradually developing symptoms or signs that
   i. start with the most common, which are
      1. loss of appetite
      2. muscle weakness
      3. persistent, worsening fatigue
      4. weight loss
   ii. include
      1. craving for salty foods, owing to salt loss
      2. diarrhea, which may be persistent
      3. fatigue
      4. headache
      5. hypoglycemia
      6. in women, irregular or absent menstrual periods
      7. irritability and depression
      8. orthostatic hypotension, low blood pressure that falls further with standing, resulting in acute manifestations such as
         a. dizziness
         b. fainting
      9. nausea
      10. sweating
      11. vomiting
      12. mouth lesions on the buccal mucosa
      13. movements that are slow, sluggish
      14. skin changes, such as
         a. hyperpigmentation, most visible on
            i. scars
            ii. skin folds
            iii. pressure points such as the elbows, knees, knuckles, and toes
            iv. lips and mucous membranes such as the buccal mucosa.
         b. patchy or unnatural colouring
         c. paleness
   iii. may be recognized only after a stressful event such as illness, accident, surgery or, possibly, invasive procedures in oral healthcare, which causes worsening of the condition
   d. in the chronic state is treated with hormone replacement therapy, using medications
      i. for the hormones that the adrenal glands are not producing, especially
         1. cortisol, replaced with a synthetic glucocorticoid
         2. aldosterone, replaced with a mineralocorticoid, which may require increase in oral salt intake
ii. except where the cause, such as tuberculosis (CDHO Advisory), is treatable
e. during an Addisonian crisis (also known as “adrenal crisis”) is treated with
   i. intravenous injections of glucocorticoids
   ii. large volumes of intravenous saline solution with dextrose
   iii. immediate post-crisis care with
      1. oral fluids and medications
      2. gradual adjustment of glucocorticoids and, if required, a mineralocorticoid.

2. Congenital adrenal hyperplasia
   a. is caused by an error on a single gene
   b. is inherited
   c. results in
      i. deficiency of
         1. cortisol
         2. aldosterone
      ii. excess of androgens
   d. presents symptoms and signs that vary from unnoticeable to severe
      i. in the mild form may include
         1. acne
         2. for children
            a. height shorter than that of parents at a similar age
            b. early signs of puberty
         3. for women
            a. irregular periods
            b. difficulty becoming pregnant
            c. excess facial hair
      ii. in the severe form may include
         1. dehydration
         2. blood pressure abnormally low
         3. blood sugar low
         4. external genitalia in girls: altered development noted at birth that may require surgical correction
         5. for children
            a. height shorter than that of parents at a similar age
            b. early signs of puberty
         6. for men
            a. benign testicular tumours
            b. infertility
         7. for women
            a. irregular periods
            b. difficulty becoming pregnant
            c. excess facial hair
         8. salt retention: impairment
   e. is routinely screened for in newborns in Ontario and elsewhere; signs include
      i. ambiguous genitalia
      ii. salt wasting while a diagnosis is being established
      iii. abnormal weight loss or lack of expected weight gain
f. is incurable but can be treated with medications, without which the severe form can be life-threatening.

3. Cushing’s disease
   a. is a form of Cushing’s syndrome in which the pituitary gland releases too much adrenocorticotropin, which results in excess production of cortisol
   b. is caused by lesions in the pituitary, including
      i. tumour
      ii. hyperplasia
   c. is treated by
      i. surgery to remove one or other of the
         1. pituitary tumour
         2. adrenal glands
      ii. radiotherapy (CDHO Advisory) to shrink or destroy the tumour
   d. may require medications
      i. during post-operative recovery
      ii. where surgery is incompletely successful.

4. Cushing’s syndrome
   a. in incidence
      i. for endogenous causes (including Cushing’s disease), ranges from 0.7 to 5.0 per million population per year
      ii. may be more common than previously thought (particularly when taking into account exogenous, iatrogenic causes)
   b. in populations of obese persons with type 2 diabetes (CDHO Advisory) especially those with poor blood glucose control and hypertension, the reported prevalence is between 2 percent and 5 percent, signalling that it is not rare in association with diabetes, especially when this is poorly controlled
   c. is hyperfunction of the adrenal cortex due to
      i. hypersecretion of adrenocorticotropin by the pituitary gland
      ii. secretion of adrenocorticotropin by a non-pituitary tumour
      iii. adrenal adenoma, tumours of the ovary, and other organs
      iv. therapeutic administration of corticosteroids
   d. is diagnosed by tests that show for cortisol
      i. increased production
      ii. abnormal suppression
   e. arises when medications
      i. cause the body to make too much cortisol
      ii. contain extra cortisol which has brought the body level above normal
   f. may occur with
      i. adrenal tumours
      ii. ectopic ACTH syndrome
      iii. genetic Cushing’s syndrome
      iv. pituitary tumours
   g. exhibits clinical manifestations which may be so variable that they are misinterpreted, with consequent delay in diagnosis that increases morbidity and mortality
   h. commonly exhibits signs and symptoms such as
      i. blood pressure, raised
      ii. blood sugar, raised
      iii. growth rates that are slow in children
iv. moodiness, irritability, or depression
v. muscle and bone weakness
vi. obesity of the upper body, roundness of the face and neck, and thinning of the arms and legs
vii. skin problems, such as acne or reddish-blue streaks in the skin
i. in women may cause
   i. growth of hair on the face and body
   ii. menstrual irregularities
j. in men may reduce
   i. fertility
   ii. sex drive
k. is medically investigated for excess cortisol production with
   i. blood, urine and, sometimes, saliva tests
   ii. examinations to determine the cause of the excess production
l. is treated for the cause of the excess of cortisol in the body resulting from
   i. medication used for the Cushing’s syndrome or another disorder, which is managed by
      1. dose reduction
      2. medication change
   ii. excess production by the body arising from
      1. surgery
      2. radiation
      3. combination of treatments
m. can usually be successfully treated with medications.

5. Hyperaldosteronism
   a. though rare is considered one of the more common causes of secondary hypertension *(CDHO Advisory)*
   b. may be
      i. caused by tumor in an adrenal gland
      ii. a response to various diseases
   c. may, through high aldosterone levels, cause
      i. high blood pressure
      ii. low potassium levels leading to
         1. weakness
         2. tingling
         3. muscle spasms
         4. periods of temporary paralysis
   d. is medically assessed with blood-level measurements of
      i. sodium
      ii. potassium
      iii. aldosterone
   e. is treated by
      i. removal of the tumour
      ii. medications to block the action of aldosterone.

6. Pheochromocytoma, the tumour, the effects of which are
   a. characterized by
      i. high blood pressure, the most important symptom
      ii. fast and pounding pulse
      iii. excessive sweating
iv. light-headedness when standing
v. rapid breathing
vi. severe headaches

b. medically investigated by
i. measurements of blood-level of catecholamines
ii. tumour detection by imaging

c. is treated by
i. medications to control blood pressure until the pheochromocytoma is removed
ii. surgical removal of the pheochromocytoma.

7. **Virilization** is
   
a. caused by excess production of androgens
   i. usually resulting from causes such as
      1. enlargement of the hormone-producing portions of the adrenal cortex (adrenal hyperplasia)
      2. hormone-producing tumour in the adrenal gland
   ii. occasionally resulting from
      1. a tumour outside the adrenal gland that produces androgens
      2. cystic enlargement of the ovaries
      3. enzyme abnormalities
   iii. sometimes resulting from consumption by athletes of large quantities of androgens, referred to as anabolic steroids, to increase muscle bulk

b. is characterized by
i. excess facial and body hair
ii. baldness
iii. acne
iv. deepening of the voice
v. increased muscularity
vi. increased sex drive associated with the development of exaggerated masculine characteristics, usually in women, often as a result of the adrenal glands overproducing androgens

c. is medically assessed by
i. the physical appearance of virilization
ii. the dexamethasone suppression test

d. is treated by
i. surgical removal of the tumor
ii. medications to reduce the excess hormone production.

**Multimedia and images**

[Hypothalamus](#)
[Pituitary](#)

**Comorbidity, complications and associated conditions**

Comorbid conditions are those which co-exist with disorders of the adrenal gland but which are not believed to be caused by it. Complications and associated conditions are those that may have some link with it. Distinguishing among comorbid conditions, complications and associated conditions may be difficult in clinical practice, especially with disorders of the adrenal gland.
1. **Addison’s disease**
   - a. anorexia nervosa
   - b. autoimmune disorders
   - c. irritability and depression
   - d. type 1 Diabetes

2. **Cushing’s disease**
   - a. cardiovascular disease
   - b. diabetes
   - c. hypertension, which may not fully recover following successful treatment of the Cushing’s disease
   - d. immune system disorders
   - e. psychiatric disorders

**Oral health considerations**

**Resources consulted**
- Addison Disease, Medscape
- Adrenal crisis provoked by dental infection: case report and review of the literature, PubMed
- Adrenal Disease and Pregnancy, Medscape
- Candidiasis, Medscape
- Dental management of patients with endocrine disorders, J Clin Exp Dent
- Management of patients with adrenocortical insufficiency in the dental clinic, PubMed
- Steroid cover for dental patients on long-term steroid medication: proposed clinical guidelines based upon a critical review of the literature, British Dental Journal
- Supplemental corticosteroids for dental patients with adrenal insufficiency, Journal of the American Dental Association

1. Addison’s disease
   - a. is a serious condition that requires the dental hygienist, as a matter of routine, to consult with the patient/client’s family physician
      - i. about the need for supplementary medication
         - 1. during pregnancy
         - 2. for children and adults with adrenal insufficiency
      - ii. to explain the nature of the intended dental hygiene procedures
   - b. may cause signs and symptoms that the dental hygienist should draw to the attention of the primary care physician, such as
      - i. mouth lesions, such as sores, including chronic mucocutaneous candidiasis
      - ii. patchy hyperpigmentation of the oral mucosa, and various skin sites, associated with increased melanin
      - iii. bronzing of the skin
   - c. requires oral healthcare to follow a general clinical plan that involves
      - i. recognizing the possibility of orthostatic hypotension
      - ii. providing treatment in the morning
      - iii. minimizing physical and psychological stresses, for which dental hygiene may be a cause
      - iv. interrupting treatment in an Addisonian crisis
   - b. is treated with a synthetic glucocorticoid to replace the missing endogenous cortisol, the effects of which may complicate oral healthcare procedures, including
i. delayed wound healing
ii. increased capillary fragility
iii. alveolar bone loss, with the possibility of pathological fractures

c. produces Addisonian crisis only rarely in oral healthcare though the risk
   i. may be increased with dental infection in children with adrenal
   insufficiency, and thus may require antibiotic treatment or prophylaxis
   ii. is somewhat higher with primary adrenal insufficiency than with
   secondary adrenal insufficiency

d. when resulting either from primary adrenal insufficiency or secondary adrenal
   insufficiency does not normally require cortisol supplementation or related
   cover for
   i. nonsurgical periodontal treatment
   ii. minor surgical procedures under local anesthesia

e. during pregnancy, treatment is continued throughout with glucocorticoid and
   mineralocorticoid replacement dosages; some patients/clients may require
   additional glucocorticoid in the third trimester

2. Cushing’s syndrome and Cushing’s disease
   a. are risk factors for oral candidiasis and may require antifungal prophylaxis
   b. require removal of dental appliances from the mouth during imaging for
      differential diagnosis
   c. require recognition that Cushing’s syndrome is not rare in association with
      diabetes (CDHO Advisory) especially when poorly controlled
   d. may increase the risk of
      i. infection with complex dental procedures
      ii. cardiovascular collapse, in which the heart stops pumping blood
   e. may be associated with
      i. hypertension, in connection with which the dental hygienist may measure
         the blood pressure prior to implementing procedures
      ii. hyperglycemia
   f. may display signs that the dental hygienist should report to the primary care
      physician if the patient/client is unaware of them and their possible significance,
      such
      i. facial edema (“moon face”)
      ii. skin that appears tanned
      iii. blotchy gingiva, palate, and buccal mucosa
   g. may in Cushing’s syndrome be caused by the effect of corticosteroids used to
      treat other conditions, resulting in the risk of
      i. delayed wound healing
      ii. increased capillary fragility
      iii. alveolar bone loss.

MEDICATIONS SUMMARY

Sourcing medications information

1. Adverse effect database
   - Health Canada’s Marketed Health Products Directorate
toll-free 1-866-234-2345
   - Health Canada’s Drug Product Database
2. Specialized organizations
   - US National Library of Medicine and the National Institutes of Health Medline Plus Drug Information
   - WebMD

3. Medications considerations
   All medications have potential side effects whether taken alone or in combination with other prescription medications, or as over-the-counter (OTC) or herbal medications.

4. Information on herbals and supplements
   - US National Library of Medicine and the National Institutes of Health Medline Plus Drug Information All Herbs and Supplements

Types of medications

1. Addison’s disease
   a. synthetic glucocorticoids
      - hydrocortisone (Cortef®, Hydrocortone®)
      - prednisone (Sterapred®)
      - Dexamethasone (Decadron®)
   b. mineralocorticoid
      - fludrocortisone acetate (Florinef® Acetate)

2. Cushing’s disease, following surgery
   - hydrocortisone (Cortef®, Hydrocortone®)
   - ketoconazole (Nizoral®)
   - mitotane (Lysodren®)

3. Cushing’s syndrome
   - cimetidine (Tagamet®)
   - famotidine (Pepcid)
   - ketoconazole (Nizoral®)
   - lansoprazole (Prevacid®)
   - mitotane (Lysodren®)
   - omeprazole (Prilosec®)
   - pantoprazole (Protonix®)
   - ranitidine (Zantac®)

4. Congenital adrenal hyperplasia
   a. mineralocorticoid
      - fludrocortisone acetate (Florinef® Acetate)
   b. synthetic glucocorticoid
      - hydrocortisone (Cortef®, Hydrocortone®)

5. Hyperaldosteronism
   - amiloride and hydrochlorothiazide (Moduretic®)
   - eplerenone (Inspra®)
   - nifedipine (Adalat®, Nifedica®)
   - spironolactone and hydrochlorothiazide (Aldactazide®, Spironazide®)
   - triamterene and hydrochlorothiazide (Dyazide®, Maxzide®)
6. Pheochromocytoma
   - atenolol (Tenormin®)
   - doxazosin mesylate (Cardura®)
   - phenoxybenzamine (Dibenzyline®)
   - propranolol oral (Inderal®, Pronol®)

7. Virilization
   - combinations of estrogen and progestin (synthetic progesterone)
   - dexamethasone oral (Dexamethasone Intensol®)

Side effects of medications
See the links above to the specific medications.

THE MEDICAL AND MEDICATIONS HISTORY

The dental hygienist’s medical and medications history-taking should
1. focus on screening the patient/client prior to treatment decision relative to
   a. key symptoms
   b. medications considerations
   c. contraindications
   d. complications
   e. comorbidities
   f. associated conditions
2. gather information needed preparatory to requests for advice from the primary or
   specialized care provider(s)
3. inquire about
   a. pointers in the history of significance to disorders of the adrenal gland, including
      i. Addison’s disease
      ii. Cushing’s syndrome and Cushing’s disease
      iii. diabetes, types 1 and 2
      iv. pheochromocytoma
      v. pregnancy
      vi. thyroid disease
   b. symptoms indicative of problematic control of Addison’s disease, Cushing’s
      syndrome and Cushing’s disease
   c. the patient/client’s understanding and acceptance of the need for oral
      healthcare
   d. medications considerations, including over-the-counter medications, herbals
      and supplements
   e. problems with previous dental/dental hygiene care
   f. problems with infections generally and specifically associated with
      dental/dental hygiene care
   g. the patient/client’s current state of health
   h. how the patient/client’s current symptoms relate to
      i. oral health
      ii. health generally
      iii. recent changes in the patient/client’s condition.
### IDENTIFYING AND CONTACTING THE MOST APPROPRIATE HEALTHCARE PROVIDER(S) FOR ADVICE

Identifying and contacting the most appropriate healthcare provider(s) from whom to obtain medical or other advice pertinent to a particular patient/client

The dental hygienist should
1. record the name of the physician/primary care provider most closely associated with the patient/client’s healthcare, and the telephone number
2. obtain from the patient/client, parent/guardian or substitute decision-maker written, informed consent to contact the identified physician/primary healthcare provider
3. use a consent/medical consultation form, and be prepared to fax the form to the provider
4. include on the form a standardized statement of the Procedures proposed, with a request for advice on proceeding or not at the particular time, and any precautions to be observed.

### UNDERSTANDING AND TAKING APPROPRIATE PRECAUTIONS

**Infection Control**

Dental hygienists are required to keep their practices current with infection control policies and procedures, especially in relation to

2. relevant occupational health and safety legislative requirements
3. relevant public health legislative requirements
4. best practices or other protocols specific to the medical condition of the patient/client.

### DECIDING WHEN AND WHEN NOT TO INITIATE THE PROCEDURES PROPOSED

The dental hygienist
1. should not implement the Procedures without prior consultation with the appropriate primary or specialist care provider(s)
2. may postpone the Procedures pending medical advice if the patient/client
   a. has not complied with pre-medication as directed by the prescribing physician
   b. has recently changed significant medications, under medical advice or otherwise
   c. has recently experienced changes in his/her medical condition such as medication or other side effects of treatment
   d. is unable to provide the dental hygienist with sufficient information about
      i. medications
      ii. the medical history
   e. has symptoms or signs of
      i. exacerbation of the medical condition
      ii. comorbidity, complication or an associated condition
   f. not recently or ever sought and received medical advice relative to oral healthcare procedures
   g. is deeply concerned about any aspect of his or her medical condition.
### DEALING WITH ANY ADVERSE EVENTS ARISING DURING THE PROCEDURES

Dental hygienists are required to initiate emergency protocols as required by the College of Dental Hygienists of Ontario’s Standards of Practice, and as appropriate for the condition of the patient/client.

First-aid provisions and responses as required for current certification in first aid.

### RECORD KEEPING

Subject to Ontario Regulation 9/08 Part III.1, Records, in particular S 12.1 (1) and (2), for a patient/client with a history of disorders of the adrenal gland, the dental hygienist should specifically record:

1. a summary of the medical and medications history
2. any advice received from the physician/primary care provider relative to the patient/client’s condition
3. the decision made by the dental hygienist, with reasons
4. compliance with the precautions required
5. all Procedure(s) used
6. any advice given to the patient/client.

### ADVISING THE PATIENT/CLIENT

The dental hygienists should:

1. urge the patient/client to alert any healthcare professional who proposes any intervention or test that he or she
   a. has a history of disorders of the adrenal gland, in particular Cushing’s syndrome, Cushing’s disease or adrenal insufficiency (including Addison’s disease)
   b. is taking cortisol or other medication
2. should discuss, as appropriate
   a. the importance of the patient/client’s
      i. self-checking the mouth regularly for new signs or symptoms
      ii. reporting to the appropriate healthcare provider any changes in the mouth
   b. the need for regular oral health examinations and preventive oral healthcare
   c. oral self-care including information about
      i. choice of toothpaste
      ii. tooth-brushing techniques and related devices
      iii. dental flossing
      iv. mouth rinses
      v. management of a dry mouth
   d. the importance of an appropriate diet in the maintenance of oral health
   e. for persons at an advanced stage of a disease or debilitation
      i. regimens for oral hygiene as a component of supportive care and palliative care
      ii. the role of the family caregiver, with emphasis on maintaining an infection-free environment through hand-washing and, if appropriate, wearing gloves
      iii. scheduling and duration of appointments to minimize stress and fatigue
f. comfort level while reclining, and stress and anxiety related to the Procedures
g. medication side effects such as dry mouth, and recommend treatment
h. mouth ulcers and other conditions of the mouth relating to disorders of the adrenal gland, comorbidities, complications or associated conditions, medications or diet
i. pain management.

**BENEFITS/HARMS OF IMPLEMENTING THE RECOMMENDATIONS**

**POTENTIAL BENEFITS**

1. Promoting health through oral hygiene for persons who have disorders of the adrenal gland.
2. Reducing the adverse effects, such as stress and anxiety by
   a. consultation with the primary or other care provider prior to implementation of the Procedures
   b. generally increasing the comfort level of persons in the course of dental-hygiene interventions
   c. using appropriate techniques of communication
   d. providing advice on scheduling and duration of appointments.
3. Reducing the risk that oral health needs are unmet.

**POTENTIAL HARMs**

1. Causing injury to a patient/client by failure to recognize the risk of postural hypotension.
2. Performing the Procedures at an inappropriate time, such as
   a. when the Cushing’s syndrome patient/client’s diabetes is poorly controlled
   b. when stress tolerance is low or concurrent infection is present in the patient/client with adrenal insufficiency (e.g., Addison’s disease), particularly in the absence of consideration of supplemental dose(s) of corticosteroid – an adrenal crisis is a life-threatening medical emergency
   c. in the presence of complications for which prior medical advice is required
   d. in the presence of acute oral infection without prior medical advice.
3. Disturbing the normal dietary and medications routine of a person with a disorder of the adrenal gland.
4. Inappropriate management of pain or medication.

**CONTRAINDICATIONS**

**CONTRAINDICATIONS IN REGULATIONS**

Identified in the [*Dental Hygiene Act, 1991 – O. Reg. 218/94 Part III*](#)

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