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1. Introduction and Purpose

1.1 Introduction

The College of Optometrists of Ontario is the regulatory body for the optometric profession in Ontario. In order to assist the College in meeting its objects, documents relating to optometric practice are periodically developed and published. This Optometric Practice Reference (OPR) represents a complete revision of The Guide to the Practice of Optometry and supersedes previous versions of The Guide. It will be periodically updated in response to changes in public need, economic forces, advances in health care sciences, and statutory and regulatory requirements.

1.2 The Purpose of the OPR

The OPR fulfills four key functions, as follows:

- **To provide information to the public and patients** and/or their representatives regarding the services and behaviour that can be expected from a member of the College.

- **To inform members of the College** of the principles and criteria which underlie the standards of practice and behaviour of the profession and to provide guidelines which the members may use in determining best practices for specific situations.

- **To assist committees of the College** to carry out their work. Some statutory committees of the College are required to assess the practice of members in the course of fulfilling their mandate to protect the public. The principles, standards, and guidelines described herein serve as a basis for their assessment. The Quality Assurance Committee employs regulatory and professional standards when assessing the practice of individual members and uses the clinical guidelines to help members move towards best practices. The Complaints and Executive Committees consider standards and guidelines for the purpose of case disposition. An alleged breach of a regulatory or professional standard is usually required before a member will be referred to either the Quality Assurance or Discipline Committee.

- **To promote ongoing discussion** and education among optometrists, ultimately leading to improvements in the quality of care and best practice for services provided to patients.
2. **The Practice of Optometry**

2.1 **Scope of Practice**

The *Optometry Act* specifies the scope of practice of optometry as follows:

The practice of optometry is the assessment of the eye and vision system and the diagnosis, treatment and prevention of:

a) disorders of refraction;

b) sensory and oculomotor disorders and dysfunctions of the eye and vision system;

and

c) prescribed diseases.

2.2 **Authorized Acts**

The Province of Ontario uses the concept of *controlled acts* to describe healthcare procedures and responsibilities that are not within the domain of the public. This forms the basis for regulation of healthcare services in the province. Fourteen of these acts are described in the *Regulated Health Professions Act* and each profession-specific act, such as the *Optometry Act*, specifies those that are authorized to the professional group.

In the course of engaging in the practice of optometry, optometrists are authorized, subject to the terms, conditions and limitations imposed on their certificate of registration, to perform the following:

1. Communicating a diagnosis identifying, as the cause of a person’s symptoms, a disorder of refraction, a sensory or oculomotor disorder of the eye or vision system or a prescribed disease.

2. Applying a prescribed form of energy.

2.1 Prescribing drugs designated in the regulations.

3. Prescribing or dispensing for vision or eye problems, subnormal vision devices, contact lenses or eye glasses.

2.3 **The Practice of Optometry**

There are several key principles that form the foundation for the optometric profession. The practice of optometry is:

**Professionally based**

Above all, the purpose of the optometric profession is to provide for the healthcare needs of patients, by placing the patient’s best interest foremost.
2.4 The Practitioner/Patient Relationship

**Scientifically based**
The profession of optometry is founded on research and education in the life and vision sciences, combined with scientific and technological expertise.

The College supports the use of evidenced-based techniques, instrumentation and therapies that have the support of peer-reviewed literature.

**Primary health care**
Optometrists are independent practitioners who work within Ontario's healthcare system in co-operation with other providers of related services for the ultimate benefit of patients.

**Related to eyes and vision**
The services generally provided in primary care optometry include:

- the assessment, diagnosis, management and prevention of conditions of the eye and vision system;
- the treatment, correction or rehabilitation of conditions of the eye and vision system;
- the dispensing of eye glasses, contact lenses, and low vision devices;
- referral to, or shared care with, allied health professionals; and
- the promotion of good vision and health through education.

**Accountable to the public**
The practice of optometry in Ontario is governed by the College of Optometrists of Ontario under the authority of the Regulated Health Professions Act and the Optometry Act. Accountability is assured in a number of ways including public representation on Council and College committees, and open (public) Council meetings and Discipline hearings. In addition, the College publishes an Annual Report and provides annual reports to the Minister of Health and Long-Term Care.

2.4 The Practitioner/Patient Relationship

With reference to the practitioner/patient relationship, the optometrist will:

**Be accountable**
Optometrists are accountable to their individual patients and to the College for all services provided, both personally and by others who are under their direction and supervision.

**Act in the patient’s best interest**
Optometrists are responsible for fostering a relationship of trust with the patient and putting the patient’s interest above their own. The Professional Misconduct
Regulations protect such interests. Examples of acts that are considered to be professional misconduct include:

- treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence; \( \text{(O.Reg. 119/94 Part I under the Optometry Act (1. s.10))} \)
- failing to refer a patient to a regulated health professional when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral and examination. \( \text{(O. Reg. 119/94 Part I under the Optometry Act (1. s.11))} \)

**Encourage patient decision-making**

Consistent with patient-centered care, optometrists give patients the information and counselling necessary for them to make informed choices about treatment and ongoing care, and respect the choices their patients make.

When employing techniques, instrumentation and/or therapies that lack the support of peer-reviewed literature, optometrists are expected to discuss the risks and benefits with the patient and obtain informed consent with documentation where appropriate.

**Protect confidentiality**

Historical and clinical information is gathered in a manner respecting patient privacy. All records are kept confidential and secure. Release of information requires the consent of the patient or their representative(s), except as required or allowed by law, such as the *Personal Health Information Protection Act*.

**Be ethical**

Optometrists’ behaviour and business practices conform to the profession’s accepted ethical standards. This is emphasized in the Professional Misconduct Regulation which includes the following as an act of professional misconduct:

- engaging in conduct or performing an act that, having regard to all the circumstances, would reasonably be regarded by members as disgraceful, dishonourable, unprofessional or unethical. \( \text{(O. Reg. 119/94 Part I under the Optometry Act (1. s.39))} \)
3. **Standards and Guidelines: Definitions**

The Optometric Practice Reference contains standards of practice (both regulatory and professional) and clinical guidelines.

### 3.1 Regulatory Standards

Regulatory standards are found in the legislation of the Province of Ontario, such as the *Regulated Health Professions Act*, the *Ontario Regulations*, and the *Optometry Act*. These standards are mandatory requirements for the profession, and must be complied with by the optometrist. Non-compliance with these standards could result in an allegation of professional misconduct.

### 3.2 Professional Standards

Professional standards describe what a consensus of prudent practitioners would do in certain circumstances. Every profession has standards of practice that come from a variety of sources such as educational programs, clinical training, evidence-based literature, informal professional dialogue, and the decisions of a College and the Courts. In addition to writing standards into a regulation, a College may also publish documents that describe the existing generally accepted standards on recurring and/or significant issues. These publications are more valuable if they are the result of a consultation process.

The requirement to maintain the standards of practice is supported by the Professional Misconduct Regulation under the Optometry Act. While the strongest evidence of professional standards of practice is usually expert testimony, College publications and evidence-based literature may support or reinforce the expert testimony and make it more likely to be accepted.

### 3.3 Clinical Guidelines

Guidelines are not mandatory; they are suggestions that will assist the prudent practitioner to reach the level of best practice. Guidelines evolve with current research and are shared through various professional publications and communications. While guidelines usually describe desirable practice, their application may be limited by the scope of practice allowed within a given jurisdiction.

Revised: April 2014
PART 2. Optometric Care
4. General Clinical Matters

4.1 Clinical Equipment

**Description**
Optometrists are expected to be equipped with the instrumentation and supplies required to provide services that meet the standards of practice of the profession.

**Regulatory Standard**
The Professional Misconduct Regulation *(O. Reg. 119/94 Part I under the Optometry Act)* includes the following acts of professional misconduct:

11. Failing to refer a patient to another professional whose profession is regulated under the *Regulated Health Professions Act, 1991* when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**
Optometrists have access to, and ensure proficient use of equipment, instrumentation, drugs and supplies for the following:

- measurement of visual acuity at distance and near;
- evaluation of visual fields and colour vision;
- determination of refractive status of the eyes, both objectively and subjectively;
- measurement of corneal curvature and thickness;
- assessment of ocular motility and binocular function;
- examination of the eye and ocular adnexa, including
  - a biomicroscope;
  - ophthalmoscopes (both direct and indirect);
  - accessory lenses;
- measurement of intraocular pressure;
- pupillary dilation, cycloplegia, topical ocular anesthesia, ophthalmic disclosing agents;
- measurement of the parameters of spectacles and contact lenses;
- in-office treatment of common primary ocular emergencies;
- disinfection of instruments and diagnostic contact lenses;
- infection control and cleanliness *(OPR 4.7).*

When optometrists do not have a specific instrument, they must have arrangements in place whereby the tests may be performed elsewhere, by requisition or referral, and the results obtained for analysis and retention in the clinical record.
Optometrists are expected to maintain their equipment and instrumentation in good working order, including the provision of regular re-calibration.

**Clinical Guideline**
Scientific and technological advances will bring changes to the equipment available. It is recommended that optometrists stay current with the new technology.
4.2 **Required Clinical Information**

The provision of optometric care relies on acquiring, updating and maintaining a complement of information about each patient. Analysis of these data enables optometrists to develop an accurate understanding of the ocular status of patients and devise appropriate management plans. Standards relating to required clinical information are intended to ensure the provision of optimal and efficient patient care.

**Regulatory Standard**

The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

2. Exceeding the scope of practice of the profession.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the *Regulated Health Professions Act, 1991* when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

Required clinical information to be obtained about patients at their first presentation includes:

- the chief concern or request(s);
- a review of ocular or visual symptoms or experiences;
- a general health history, with emphasis on eyes and vision, including medications used and applicable family history;
- the occupational and avocational visual environment and demands;
- the measurement and description of their ophthalmic appliances including purpose and effectiveness; and
- the results of the observation, examination or measurement of:
  - apparent and relevant physical, emotional and mental status;
  - the external eye and adnexa;
  - pupillary function;
  - the anterior segment *(OPR 6.1)* and, when indicated, corneal thickness;
  - ocular media;
  - the posterior segment *(OPR 6.2)*;
  - intraocular pressure in adults and, when indicated, in children;
  - presenting monocular visual acuities at distance and near;
  -
4.2 Required Clinical Information

- refractive status and best-corrected monocular visual acuity;
- accommodative function;
- oculomotor status and, when indicated, fusional reserves;
- other sensory functions, when indicated, such as visual fields, colour vision, stereoacuity, sensory fusion and contrast sensitivity.

All required clinical information must be clearly documented in the patient’s health record (OPR 5.1). In situations where it is not possible to obtain specific required information, justification must be documented.

The information will be kept current by re-evaluation at subsequent examinations. Patient signs, symptoms and risk factors influence decisions optometrists make about the frequency of re-evaluation.

In emergency or urgent situations, it may be impractical to obtain all information at the first visit. In such cases, a specific assessment is appropriate (OPR 4.6). Also, the full complement of required clinical information may not be necessary when providing specific assessments or consultation services for referring optometrists, physicians or nurse practitioners. The same applies to patients who have not been directly referred but are already under the established care of another optometrist or ophthalmologist. In such cases, optometrists will determine what is clinically necessary based on the reason for presentation.

Clinical Guideline

At specific assessment, consultation or emergency visits, where patients have not been directly referred but report being under the established care of another optometrist or ophthalmologist, optometrists should request confirmation of the care provided by the other practitioner(s). In all situations, clear and timely communication between practitioners ensures that patient care is optimized while duplication of testing is minimized.

Optometrists may choose to employ ancillary procedures in addition to those required to obtain the normal complement of required clinical information in order to enhance or refine a clinical diagnosis or management plan. This is particularly true when the rapid pace of scientific and technological advancement in equipment and instrumentation is considered (OPR 4.1). Examples of such procedures include, but are not limited to:

- fundus photography, scanning laser polarimetry, optical coherence tomography, scanning laser ophthalmoscopy, and similar high-technology imaging/mapping systems;
- corneal topography;
- ophthalmic ultrasonography (A or B scan), ultrasound biomicroscopy;
• advanced refractive technologies (e.g. wavefront analysis, aberrometry, etc);  
• visual electrophysiology (e.g. electroretinograms, visually evoked potentials, 
  electro-oculograms).

While these procedures may contribute valuable information in the assessment of specific clinical presentations, optometrists are reminded that patients should not be required or coerced to undergo ancillary procedures. Prior informed consent is necessary.

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4.3 Delegation and Assignment

Introduction

The Province of Ontario utilizes the concept of “controlled acts” to control who may perform healthcare procedures and responsibilities that have a high risk of harm associated with their performance. The controlled acts are listed in the Regulated Health Professions Act, 1991 (RHPA). Each profession-specific act, such as the Optometry Act, 1991, specifies any controlled acts that the members of the profession are authorized to perform (the profession’s “authorized acts”). Each regulated profession has a defined scope of practice and some have corresponding authorized acts set out in the profession-specific Act.

There are also numerous non-controlled procedures, some of which are limited to objective data collection and others, which carry a potential risk of harm to the patient. Although these procedures are in the public domain (i.e. they are NOT controlled acts), they may require specific training and skills.

The term delegation refers to the process whereby a regulated health professional (RHP), who has a controlled act within his/her scope of practice, orders another person who would not otherwise be authorized to do so to perform this act.

The term assignment refers to the process of an RHP assigning the performance of a non-controlled procedure to another person.

Both delegation and assignment of optometric procedures in appropriate circumstances may allow a more timely and efficient delivery of optometric care, making optimal use of time and personnel. In every instance of delegation and assignment, the primary consideration should be the best interests of the patient.

It is a general expectation that optometrists will be responsible for, and appropriately supervise all delegated and assigned activities within their practices. The level of supervision varies with the risk associated with the delegated or assigned procedure. Direct supervision refers to situations in which the optometrist is physically present in the same clinical location. This allows the optometrist to immediately intervene when necessary. Direct supervision is expected for ALL delegation (controlled acts), and of any assigned activities, which require interpretation in the performance of the procedure and/or may present a risk of harm to the patient. Remote supervision refers to situations in which the presence of the optometrist is not necessarily required since there is no potential risk of harm to the patient. This would be appropriate for certain clinical procedures and objective data collection.

The responsibility for all aspects of any delegated acts or assigned procedures always remains with the optometrist.

Optometrists may also receive delegation of a controlled act not authorized to optometry.
**Quality Assurance**
The optometrist is expected to ensure there is an ongoing quality assurance mechanism.

**Assignment**

**Optometrist-Patient Relationship**
Assignment of certain procedures that are not controlled acts may occur as part of the optometric examination and may occur prior to the optometrist assessing the patient. For example, pre-testing using automated instruments may occur prior to the optometrist seeing the patient.

**Presence of the Optometrist**
Procedures that are completely objective, present no inherent risk of harm and require no interpretation by the person performing the procedure may be performed without the presence of the optometrist and are considered to be *remotely supervised*. This could include automated procedures such as objective auto-refraction, auto-perimetry and non-mydriatic retinal photography. However, the optometrist is expected to review the results of these remotely supervised procedures and communicate appropriately with the patient.

Direct supervision *must* occur whenever clinical interpretation is necessary during the procedure (i.e. subjective refraction), or when the procedure poses a potential risk of harm (i.e. applanation tonometry).

**Process for assignment**
As with delegation, it is expected that assignment will only occur with certain processes in place, including:

- education and assessment ensuring the currency of the assignee's knowledge, skills and judgement;
- documentation/references for performance of procedures; and
- ensuring only those procedures that form part of the optometrist's regular practice are assigned.
4.3 Delegation and Assignment

Professional Standard for Receiving Delegation of Controlled Acts

In the public interest, there are situations when an optometrist could receive delegation from another regulated health professional (RHP) to perform a controlled act not authorized to optometry. Other RHP’s have delegation regulations and established protocols for delegation of which the member should be aware. In order for an optometrist to receive delegation from another RHP, all of the following criteria must be met:

i. a process for receiving delegation is in place;

ii. the member will have a reasonable belief that the RHP delegating the act is authorized to delegate the act, has the ability to perform the act competently, and is delegating in accordance with relevant regulations governing his or her profession;

iii. the optometrist should be competent to perform the act safely, effectively, and ethically;

iv. appropriate resources, such as equipment and supplies, are available and serviceable;

v. the delegated act is clearly defined;

vi. the delegated act is within the assessment of the eye and vision system and the diagnosis, treatment and prevention of disorders of refraction, prescribed diseases, and sensory and oculomotor disorders and dysfunctions of the eye and vision system;

vii. the duration of the delegation will be clearly defined and relate to a specific patient;

viii. the optometrist ensures that patient consent to having the act performed under delegation to the optometrist is obtained and recorded in the patient’s health record;

ix. a mechanism exists to contact the RHP who delegated the act if there is an adverse or unexpected outcome; and

x. the identity of the RHP delegating the controlled act and of the member performing the controlled act will be recorded in the patient health record.
Guideline for Delegation by an Optometrist

The optometrist remains responsible for all activity within his/her office, including delegated and assigned procedures. It is prudent to always ensure that any activities being delegated or assigned are appropriately supervised and performed in a safe, effective and accurate manner.

Good communication skills for both the optometrist and staff members are essential for effective delivery of patient care, particularly when procedures are delegated or assigned. Formal courses in procedures and communication are very helpful to complement appropriate staff training. Regular staff training, assessment and an effective office policy and procedural manual are also helpful resources to promote competence.

It is also wise to ensure that the person performing the delegated or assigned procedure is clearly indicated within the patient health record. This is essential for both quality assurance and medico-legal reasons.
4.4 The Use and Prescribing of Drugs in Optometric Practice

Description
Optometrists use diagnostic and therapeutic drugs in the course of providing patient care. The College recognizes that there is a distinction between the use of drugs within a clinical setting and the prescribing of drugs for treatment. Optometrists with authority to prescribe drugs can do so to manage patients with diseases and disorders of the eye and vision system. Such drugs are usually topically applied eye drops or ointments and oral medications for corneal or eyelid infections only.

Regulatory Standard
The Optometry Act, 1991 states that in the course of engaging in the practice of optometry, optometrists are authorized, subject to terms, conditions and limitations imposed on his or her certificate of registration, to perform the following controlled act:

2.1 Prescribing drugs designated in the regulations.
The Designated Drugs and Standards of Practice Regulation, (O.Reg. 112/11 under the Optometry Act, 1991) describes the following conditions under which an optometrist may prescribe drugs and the drugs that may be prescribed:

Drugs that may be prescribed
1. For the purposes of paragraph 2.1 of section 4 of the Act, and subject to sections 2, 3 and 4 and Part II of this Regulation, a member may prescribe a drug set out under a category and sub-category heading in Schedule 1.

Limitation
2. Where a limitation or a route of administration is indicated in the sub-category heading set out in Schedule 1, a member shall only prescribe a drug listed under that subcategory in compliance with the limitation and in accordance with the route of administration specified.

Training required
3. No member may prescribe any drug unless he or she has successfully completed the relevant training in pharmacology that has been approved by the Council.

Recording
4. Every time a member prescribes a drug, the member shall record the following in the patient’s health record as that record is required to be kept under section 10 of Ontario Regulation 119/94 (General) made under the Act:

1. Details of the prescription, including the drug prescribed, dosage and route of administration.

2. Details of the counselling provided by the member to or on behalf of the
4.4 The Use And Prescribing Of Drugs In Optometric Practice

patient respecting the use of the drug prescribed.

Non-prescription drugs

5. In the course of engaging in the practice of optometry a member may prescribe any drug that may lawfully be purchased or acquired without a prescription.

The standards of practice related to the prescribing of drugs for the treatment of glaucoma are as follows:

Prescribing of antiglaucoma agents

6. It is a standard of practice of the profession that in treating glaucoma a member may only prescribe a drug set out under the category of “Antiglaucoma Agents” in Schedule 1.

Open-angle glaucoma

7. (1) Subject to subsection (2) and to section 8, it is a standard of practice of the profession that a member may only treat a patient with glaucoma where the patient has primary open-angle glaucoma the treatment of which is not complicated by either a concurrent medical condition or a potentially interacting pharmacological treatment.

(2) It is a standard of practice of the profession that a member may only treat a patient having open-angle glaucoma, the treatment of which is complicated by either a concurrent medical condition or a potentially interacting pharmacological treatment, in collaboration with a physician with whom the member has established a comanagement model of care for that patient and who is,

(a) certified by the Royal College of Physicians and Surgeons of Canada as a specialist in ophthalmology; or

(b) formally recognized in writing by the College of Physicians and Surgeons of Ontario as a specialist in ophthalmology.

Referral to physician or hospital

8. (1) Subject to subsections (2) and (3), it is a standard of practice of the profession that a member shall immediately refer a patient having a form of glaucoma other than primary open angle glaucoma to a physician or to a hospital.

(2) It is a standard of practice of the profession that a member may initiate treatment for a patient having angle-closure glaucoma only in an emergency and where no physician is available to treat the patient.

(3) It is a standard of practice of the profession that a member shall immediately refer any patient being treated in accordance with subsection (2) to a physician or hospital once the emergency no longer exists or once a physician becomes available, whichever comes first.

(4) In this section, “hospital” means a hospital within the meaning of the Public Hospitals Act.
4.4 The Use and Prescribing of Drugs in Optometric Practice

SCHEDULE 1

ANTI-INFECTIVE AGENTS

Antibacterials (topical)
- azithromycin
- besifloxacin
- ciprofloxacin
- erythromycin
- framycetin
- fusidic acid
- gatifloxacin gentamicin
- moxifloxacin
- ofloxacin
- polymyxin B/gramicidin/neomycin
- polymyxin B/neomycin/bacitracin
- polymyxin B/trimethoprim
- sulfacetamide
- tetracycline
- tobramycin

Antifungals (topical)
- natamycin

Antivirals (topical)
- trifluridine
- Acyclovir

Antibacterials (oral) – for corneal or eyelid infections only and for a duration not exceeding 14 days
- amoxicillin
- amoxicillin/clavulanic acid
- azithromycin
- cephalixin
- ciprofloxacin
- clarithromycin
- clindamycin
- cloxacillin
- doxycycline
- erythromycin
- levofloxacin
- minocycline
- moxifloxacin
- tetracycline

Antivirals (oral) – for corneal or eyelid infections only
- acyclovir

Effective Date: April 2014
famciclovir
valacyclovir

**ANTI-INFLAMMATORY AGENTS**

**Corticosteroids (topical)**
- dexamethasone
- fluorometholone
- loteprednol
- prednisolone
- rimexolone

**Nonsteroidal anti-inflammatory agents (topical)**
- diclofenac
- ketorolac
- nepafenac

**ANTI-INFECTIVE/ANTI-INFLAMMATORY AGENTS**

**Antibacterials /corticosteroids (topical)**
- framycetin/gramicidin/dexamethasone
- gentamicin/betamethasone
- neomycin/fluorometholone
- neomycin/polymyxin B/dexamethasone
- neomycin/bacitracin/polymyxin B/hydrocortisone
- sulfacetamide/prednisolone
- tobramycin/dexamethasone

**MYDRIATICS**

**Mydriatics (topical)**
- atropine
- cyclopentolate
- homatropine

**ANTI-ALLERGIC AGENTS**

**Anti-allergic agents (topical)**
- emedastine
- ketotifen
- levocabastine
- lodoxamide
- nedocromil
4.4 The Use And Prescribing Of Drugs In Optometric Practice

The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.(3)

8. Failing to reveal the exact nature of a secret remedy or treatment used by the member following a patient’s request to do so.

9. Making a misrepresentation with respect to a remedy, treatment or device.
10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard

Optometrists utilizing drugs within their practices for diagnostic and therapeutic purposes will:

- use only drugs for which they have been appropriately trained, establish a diagnosis and management plan based upon case history, clinical findings and accepted treatment modalities
- not dispense a drug
- document the drug(s) used, including concentration (when applicable) and dosage
- provide appropriate patient counselling including:
  - general information, including management options, a description of the treatment(s), expected outcomes and normal healing course
  - specific information including any potential significant risks and complications requiring urgent or emergency care (OPR 4.6)
    - how to access after-hours support and emergency care
    - arrange appropriate follow-up care as indicated
- refer the patient to an appropriate health care provider when clinically indicated

Prescribing of Drugs by Optometrists with Authority to Prescribe Drugs

In addition to the above conditions, those with authority to prescribe drugs:

- will maintain appropriate continuing education relevant to the treatment of eye disease by drug therapy as specified by the College
- may issue a prescription (OPR 5.2) and document the treatment and counselling in the patient health record (OPR 5.1)
Use of Drugs by Optometrists without Authority to Prescribe Drugs

Optometrists without authority to prescribe drugs have several options for the treatment of patients with conditions requiring drug therapy, such as:

- refer to another optometrist with authority to prescribe drugs;
- refer to another regulated health care provider who can provide such care appropriate to the condition;
- initiate office treatment, then, make a referral, as above, if required for the condition.

It is professional misconduct if a prescription for drugs is issued by an optometrist without authority to prescribe drugs.

Clinical Guideline

Optometrists should be familiar with and adhere to accepted diagnostic and treatment considerations for diseases and disorders of the eye and vision system. Current literature and Clinical Practice Guidelines are helpful to guide diagnostic and therapeutic considerations.

Frequency of follow-up examinations

The frequency of follow-up examinations for conditions of the eye and vision system requiring treatment with drugs varies greatly. Optometrists should use sound clinical judgement to determine an appropriate schedule. Factors that should be considered include:

- the severity and morbidity of the condition;
- the potential adverse complications;
- the patient’s systemic health considerations; and
- expected progress of therapy.

Emergency and After-hours care

Patients may require emergency or after-hours care if the condition is not responsive to therapy or if an unexpected response to treatment occurs. During usual working hours it would be appropriate to have patients contact the optometrist’s office for instructions. Optometrists should ensure that office staff has appropriate training and direction on arranging care for emergency presentations.
Outside business hours, consideration could be given to:

- having an accessible emergency contact system, answering service or other after-hours communication modality;
- having formal arrangements with qualified practitioners to provide accessible after-hours consultation when the prescribing optometrist is not available; and
- directing patients to hospital emergency rooms when appropriate.

Additional references relevant to this topic are available on the American Optometric Association website ([www.aoa.org](http://www.aoa.org)):

- CPG 5 Care of the Patient with Primary Angle Closure Glaucoma
- CPG 7 Care of the Patient with Anterior Uveitis
- CPG 9 Care of the Patient with Open Angle Glaucoma
- CPG 10 Care of the Patient with Ocular Surface Disorders
- CPG 11 Care of the Patient with Conjunctivitis

First published: April 2004 (The Guideline for the Use of Drugs by Optometrists)
Revised: April 2011 (The Use and Prescribing of Drugs in Optometric Practice)
April 2014
4.5 Referrals

Description
A referral is a request for consultation and/or the provision of treatment made to another regulated health professional when a patient requires care that exceeds the optometrist’s scope of practice or ability.

Regulatory Standard
The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

2. Exceeding the scope of practice of the profession.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
Optometrists must be proficient in determining the necessity of appropriate referral for care. Their decisions, about the urgency and choice of consultant are influenced by the ocular and/or systemic conditions and risk factors of patients, the community in which optometrists practise and the availability of appropriate consultation.

Once the decision has been made to make a referral, appropriate documentation in the patient’s health record (OPR 5.1) is necessary, including:

- confirmation of when the referral was requested (e.g. fax information or written documentation of telephone conversation);
- appointment date, time, and consultant;
- confirmation with the patient of the appointment time and location; and
- a copy of the pertinent clinical information forwarded to the consultant.
4.5 Referrals

Timeliness of Referral

Acute conditions that pose an immediate threat to the health and/or vision of the patient require a prompt referral. Examples of these conditions include, but are not limited to:

- acute glaucoma;
- retinal detachment;
- papilledema;
- central corneal ulcer;
- sudden, unexplained vision loss; or
- vision-threatening trauma.

If the patient is placed at risk because the referral appointment is not available within an appropriate amount of time, optometrists are required to advocate on their patient’s behalf to attempt to arrange a more timely appointment. Otherwise, optometrists may need to seek an alternative source of care such as a hospital emergency department.

Clinical Guideline

When a referral letter has been written, it is appropriate in most cases to send a copy to the patient’s primary healthcare provider.

Many consultants have printed material that includes maps, directions, and office policies. Making these available may be helpful to patients attending these appointments.

If the patient has a specific request regarding the choice of consultant, this request should be honoured where possible and/or appropriate.

First Published: January 2007
Revised: April 2014
September 2014
4.6 Ocular Urgencies and Emergencies

Description
Urgencies and emergencies represent potential threats to the ocular and/or systemic health and well being of patients if not dealt with appropriately. Accordingly, specific examinations are performed to provide prompt assistance, intervention, and/or action to limit potential sequelae.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

2. Exceeding the scope of practice of the profession.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
In urgent or emergency situations, any treatment initiated by optometrists will be within the profession’s scope of practice (OPR 2.1), and will not exceed their experience or competence. An exception to this would be if a controlled act has been delegated (OPR 4.3) by a member of another regulated health profession with that authority; optometrists receiving such delegation must be properly trained to do so. Generally, optometrists are expected to:

- establish appropriate protocols and ensure that staff members are trained to recognize and respond to urgent and emergency situations;
- conduct a specific examination to evaluate the immediate problem;
- counsel ‘at-risk’ patients about signs and symptoms that may require further care (for example, possible retinal detachment symptoms following a posterior vitreous detachment);
- counsel patients to whom they have prescribed drugs regarding potential adverse reactions, and when the need for emergency services may be required; and
- make themselves available for contact by patients to whom they have initiated treatment of an urgent condition.
If the treatment involves a referral (OPR 4.5) to another health professional, the timeliness of the appointment will be appropriate to the condition and remains the responsibility of optometrists even if a staff member makes the appointment.

**Clinical Guideline**

When a referral (OPR 4.5) to another health professional is required, optometrists are expected to attempt to arrange the most appropriate consultation available. In all cases, information concerning the nature of the urgency or emergency is expected to be communicated to the practitioner receiving the referral. Unless patients are sent to the local emergency department for care, urgent or emergency referral appointments usually require a greater degree of assurance that the appointment time and date are accurately communicated to patients, and that patients attend the appointments. In cases where it is not possible to confirm an appointment, referral to the local emergency department with a note stating the reason for referral, may be necessary. In addition, it is recommended that optometrists follow up with patients on the results of appointments.

Optometrists may establish an after-hours communication strategy to guide patients in need of urgent or emergency ocular care. This may be in the form of additional recorded phone messages or signs on the office door.

Additional references relevant to urgent and emergency care are available on the American Optometric Association website (www.aoa.org):

- CPG 5 Care of the Patient with Primary Angle Closure Glaucoma
- CPG 7 Care of the Patient with Anterior Uveitis
- CPG 10 Care of the Patient with Ocular Surface Disorders
- CPG 11 Care of the Patient with Conjunctivitis
- CPG 13 Care of the Patient with Retinal Detachment and Peripheral Vitreoretinal Disease

First Published: September 2007
Revised: May 2009
February 2013
April 2014
4.7 Infection Control in the Optometric Office

Description
Within all health care facilities there is a risk of transmission of infectious agents. Standards demand that all health care workers must mitigate that risk by being educated and proactive in the area of infection control. Documents and guidelines on the topic of infection control are published and periodically updated by government agencies, health care groups and academic institutions. All optometrists must be cognizant of current information on infection control and take appropriate measures within their practices.

Regulatory Standard
The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

14. Failing to maintain the standards of practice of the profession.

39. Engaging in conduct or performing an act that, having regard to all the circumstances, would reasonably be regarded by members as disgraceful, dishonourable, unprofessional or unethical.

Professional Standard
Optometrists must take reasonable and appropriate measures to minimize the risk of contamination and subsequent transmission of infectious agents within their professional practices.

Clinical Guidelines
Optometrists should have specific Standard Operating Procedures (SOP) documented, applied and monitored that define routine practices and additional precautions for the prevention of transmission of infectious agents in an optometric office. All staff should be appropriately educated regarding the SOP.

An SOP should be developed for each office which details the:

1. techniques used to disinfect the office and control transmission of infectious agents
2. frequency of and specific responsibility for disinfection of the office and instrumentation
3. specification of the disinfection substances to be used
4. additional precautions for specific situations (e.g. patients or staff with a possible contagion)
5. plans to monitor compliance with and efficacy of the recommended precautions

Health Canada uses the term Routine Precautions to describe the system of infection prevention recommended to prevent transmission of infections in health care settings.

Routine Precautions should be applied to all patients at all times, regardless of diagnosis or infectious status. The basics of Routine Precautions are:

- hand washing (hand hygiene);
- using personal protective equipment (e.g. gloves, gowns, disposable resuscitation devices or pocket masks) when handling blood, body substances, excretions and secretions;
- appropriate handling of patient care equipment and soiled linen;
- preventing needle stick/sharp injuries;
- environmental cleaning;
- appropriately handling of waste;
- adopting personal care strategies (e.g. immunization, stay home when you are sick); and
- covering one's mouth and possibly wearing a surgical mask when coughing or sneezing.

The MOHLTC has a website specifically for Health Professionals where provincial infection control guidelines and health alerts, including the Ontario Health Pandemic Influenza Plan, may be accessed:


**Hand-washing**

Hands should be washed before and after every patient contact, with soap and warm water, for 15 – 30 seconds.

Hand sanitizers may be used if hand-washing with soap and water is unavailable or impractical.

**Gloves**

Gloves are not a substitute for hand washing and are not required for routine patient care activities in which contact is limited to a patient's intact skin.

Sterile gloves are used for surgical purposes, are individually wrapped and are not generally required for optometric purposes. Non-sterile single-use gloves are normally used in optometric offices.

Non-sterile, single use gloves should be worn for contact with blood, body fluids, secretions and excretions, mucous membranes, open skin lesions or exudative rash, for handling visibly soiled items, or if anyone involved inpatient care has open skin lesions that can pose a risk to patients or other care providers.

Gloves should be put on immediately before the procedure and removed immediately after use, before touching any environmental surfaces.
4.7 Infection Control in the Optometric Office

Transmission Based Precautions

Transmission may occur through the air or by direct contact with environmental surfaces (professional equipment, office furniture, skin to skin). Considerations for transmission based precautions may include:

- optometric support staff can play a role in initial triage of patients who are suspected of having airborne-transmitted infectious disease.
- rescheduling patients with suspected airborne-transmitted infectious disease upon entry into office; infectious particles can remain in the room for long periods of time.
- installing air exchange systems venting outside the office; a step, which may help to reduce the number of airborne pathogens.
- developing guidelines for disinfection of environmental surfaces (see sample SOP)

Infectious Material Spills

Patients can attend an optometric office in various states of poor health and various spills may occur, for example, as minor as the bleeding of a small cut, or as significant as vomiting. Optometric support staff should employ all precautions in treating and cleaning up such spills by using as necessary proper gloves, masks, gowns and disposing of contaminated materials such that no one else could come in contact with them.

Sterilization, Disinfection and Antisepsis

Sterilization

- defined as the destruction of all forms of microbial life including bacteria, viruses, spores and fungi; usually applied to situations where the epithelium has been breached and/or blood products and/or infectious tissues are involved. Sterilization may be accomplished by:
  - autoclave
  - 6% hydrogen peroxide x 30 mins
  - 2% gluteraldehyde x 10 hrs

Disinfection (after disinfection, saline-rinse then air dry)

- high-Level Disinfection destroys vegetative bacteria, mycobacterium, fungi, enveloped (lipid) and non-enveloped (non-lipid) viruses but it does not destroy bacterial spores. It is accomplished by:
  - 2% gluteraldehyde x 20 mins
  - 1:50 dilution household bleach (hypochlorites) x 20 mins
  - 6% hydrogen peroxide x 10 mins
  - 7% AHP (accelerated hydrogen peroxide = Virox®) x 20 mins
  - 0.2% Peracetic acid x 30 – 40 mins
  - formaldehyde (37% formalin)

- intermediate–Level Disinfection does not destroy mycobacteria or enveloped viruses; it is accomplished by:
4.7 Infection Control in the Optometric Office

- 1:100 dilution household bleach (hypochlorites) x 20 mins
- 3% hydrogen peroxide x 10 mins
- 0.5% AHP x 5 mins
- 60-90% alcohol x 10 mins
- iodophors (iodine or povidone-iodine)

- low-Level Disinfection destroys most vegetative bacteria and some fungi as well as enveloped (lipid) viruses **but does not destroy mycobacteria or bacterial spores.** It involves general housekeeping chores and is accomplished by:
  - QUAT (quaternary ammonium cation); multiple commercial types, i.e. Fantastik
  - phenoics (i.e. Lysol, Pine Sol)
  - 1:500 dilution household bleach

**Antisepsis**
- chemical agents intended for skin or tissue
  - isopropyl alcohol
  - chlorhexidine gluconate
  - iodophors (iodine or povidone-iodine)
### Organisms & Recommended Level of Sterilization or Disinfection*

<table>
<thead>
<tr>
<th>Organisms</th>
<th>Level of Sterilization/Disinfection</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BACTERIA WITH SPORES</strong></td>
<td>High Level Disinfection</td>
</tr>
<tr>
<td>(Bacillus subtilis, Clostridium tetani, C. difficile C. botulinum)</td>
<td></td>
</tr>
<tr>
<td><strong>PROTOZOA WITH CYSTS</strong></td>
<td>Intermediate Level Disinfection</td>
</tr>
<tr>
<td>(Giardia lamblia, Cryptosporidium parvum)</td>
<td></td>
</tr>
<tr>
<td><strong>MYCOBACTERIA</strong></td>
<td>Low Level Disinfection</td>
</tr>
<tr>
<td>(Mycobacterium tuberculosis</td>
<td></td>
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<tr>
<td>M. avium-intracellulare,</td>
<td></td>
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<tr>
<td>M. chelonae)</td>
<td></td>
</tr>
<tr>
<td><strong>NON-ENVELOPED VIRUSES</strong></td>
<td></td>
</tr>
<tr>
<td>(Coxsackieviruses, polioviruses,</td>
<td></td>
</tr>
<tr>
<td>rhinoviruses, rotaviruses,</td>
<td></td>
</tr>
<tr>
<td>Norwalk virus, hepatitis A virus</td>
<td></td>
</tr>
<tr>
<td><strong>FUNGI</strong></td>
<td></td>
</tr>
<tr>
<td>(Candida species, Cryptococcus species, Aspergillus species, Dermatophytes)</td>
<td></td>
</tr>
<tr>
<td><strong>VEGETATIVE BACTERIA</strong></td>
<td></td>
</tr>
<tr>
<td>(Staphylococcus aureus, Salmonella typhi, Pseudomonas aeruginosa, coliforms)</td>
<td></td>
</tr>
<tr>
<td><strong>ENVELOPED VIRUSES</strong></td>
<td></td>
</tr>
<tr>
<td>(Herpes simplex, varicella-zoster virus, cytomegalovirus, Epstein-Barr virus, measles virus, mumps virus, rubella virus, influenza virus, respiratory syncytial virus, hepatitis B and C viruses, hantaviruses and human immunodeficiency virus)</td>
<td></td>
</tr>
</tbody>
</table>

*Canada Communicable Disease Report
### Assessing the Risk of Patient Contact

<table>
<thead>
<tr>
<th>Situation</th>
<th>Infection Control Strategy (escalating)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Routine Patient Care</strong></td>
<td><strong>Routine Precautions</strong></td>
</tr>
<tr>
<td>No physical contact</td>
<td>Handwashing</td>
</tr>
<tr>
<td>Communication with patients &gt; 1 metre away</td>
<td>Respiratory etiquette (cover mouth/nose when coughing or sneezing, followed by proper handwashing)</td>
</tr>
<tr>
<td><strong>Physical Contact with patients (intact skin)</strong></td>
<td><strong>Contact Precautions</strong></td>
</tr>
<tr>
<td><strong>Routine Precautions</strong></td>
<td>Handwashing</td>
</tr>
<tr>
<td><strong>Physical contact with patients, where optometrist or patient has infected or open wound, non-intact skin, but no respiratory concerns</strong></td>
<td><strong>Contact Precautions</strong></td>
</tr>
<tr>
<td>Handwashing</td>
<td></td>
</tr>
<tr>
<td>Respiratory etiquette (cover mouth/nose when coughing or sneezing, followed by proper handwashing)</td>
<td></td>
</tr>
<tr>
<td><strong>Physical Contact with patients, where procedure may involve body fluids, and/or droplets</strong></td>
<td><strong>Droplet Precautions</strong></td>
</tr>
<tr>
<td>Handwashing</td>
<td></td>
</tr>
<tr>
<td>Use professional judgement (personal protective equipment (PPE)):</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Surgical Mask</td>
<td></td>
</tr>
<tr>
<td>Eye protectors</td>
<td></td>
</tr>
<tr>
<td>Gowns</td>
<td></td>
</tr>
<tr>
<td>Proper removal and disposal of PPE followed by handwashing</td>
<td></td>
</tr>
<tr>
<td><strong>Close contact with patients, respiratory symptoms</strong></td>
<td><strong>Droplet Precautions</strong></td>
</tr>
<tr>
<td>Handwashing</td>
<td></td>
</tr>
<tr>
<td>Respiratory etiquette (cover mouth/nose when coughing or sneezing, followed by proper handwashing)</td>
<td></td>
</tr>
<tr>
<td>Use professional judgement (PPE):</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Surgical mask for you and/or your patient</td>
<td></td>
</tr>
<tr>
<td>Eye protectors</td>
<td></td>
</tr>
<tr>
<td><strong>Close contact with patients, fever and respiratory symptoms</strong></td>
<td><strong>Droplet Precautions</strong></td>
</tr>
<tr>
<td>Handwashing</td>
<td></td>
</tr>
<tr>
<td>Respiratory etiquette (cover mouth/nose when coughing or sneezing, followed by proper handwashing)</td>
<td></td>
</tr>
<tr>
<td>Use professional judgement (PPE):</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td></td>
</tr>
<tr>
<td>Surgical mask for you and/ or your patient</td>
<td></td>
</tr>
<tr>
<td>Eye protectors</td>
<td></td>
</tr>
<tr>
<td>Follow health alerts if applicable</td>
<td></td>
</tr>
<tr>
<td><strong>Contact with patients with known airborne infection e.g. active TB</strong></td>
<td><strong>Airborne Precautions</strong></td>
</tr>
<tr>
<td>Handwashing</td>
<td></td>
</tr>
<tr>
<td>Respiratory etiquette (cover mouth/nose when coughing or sneezing, followed by proper handwashing)</td>
<td></td>
</tr>
<tr>
<td>Use professional judgement (PPE):</td>
<td></td>
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<tr>
<td>Gloves</td>
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<tr>
<td>Surgical mask for you and/ or your patient</td>
<td></td>
</tr>
<tr>
<td>Eye protectors</td>
<td></td>
</tr>
<tr>
<td>Follow health alerts if applicable</td>
<td></td>
</tr>
<tr>
<td><strong>HEALTH ALERT IN EFFECT</strong></td>
<td><strong>FOLLOW MOHLTC GUIDELINES</strong></td>
</tr>
</tbody>
</table>
## 4.7 Infection Control in the Optometric Office

### Disinfectant Uses, Advantages and Disadvantages

**Effective Date:** April 2014

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Uses</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alcohols</strong></td>
<td>Intermediate level disinfectant</td>
<td>Fast acting</td>
<td>Volatile, evaporation may diminish concentration</td>
</tr>
<tr>
<td></td>
<td>Disinfect thermometers, external surfaces of some equipment</td>
<td>No residue, non staining</td>
<td>May harden rubber or cause deterioration of glues</td>
</tr>
<tr>
<td></td>
<td>Equipment used for home health care</td>
<td></td>
<td>Intoxicating</td>
</tr>
<tr>
<td></td>
<td>Used as a skin antiseptic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Advantages</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fast acting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low cost</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fast acting</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Readily available in non hospital settings</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Chlorine</strong></td>
<td>Intermediate level disinfectant</td>
<td>Low cost</td>
<td>Corrosive to metals</td>
</tr>
<tr>
<td></td>
<td>Disinfect environmental surfaces</td>
<td>Fast acting</td>
<td>Inactivated by organic material</td>
</tr>
<tr>
<td></td>
<td>Effective disinfectant following blood spills; aqueous solutions (5,000 ppm / 1:10 bleach) used to decontaminate area</td>
<td>Readily available in non hospital settings</td>
<td>Irritant to skin and mucous membranes</td>
</tr>
<tr>
<td></td>
<td>After blood has been removed; sodium dichloroisocyanurate powder sprinkled directly on blood spills for decontamination and subsequent cleanup</td>
<td></td>
<td>Use in well-ventilated areas</td>
</tr>
<tr>
<td></td>
<td>Equipment used for home health care</td>
<td></td>
<td>Shelf life shortens when diluted (1:9 parts water)</td>
</tr>
<tr>
<td></td>
<td>Undiluted bleach can be used as a high level disinfectant</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Formaldehyde</strong></td>
<td>Very limited use as chemisterilant</td>
<td>Active in presence of organic materials</td>
<td>Carcinogenic, toxic, strong irritant, pungent odour</td>
</tr>
<tr>
<td></td>
<td>Sometimes used to reprocess hemodialyzers</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gaseous form used to decontaminate laboratory safety cabinets</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Gluteraldehydes</strong></td>
<td>2% formulations — high level disinfection for heat sensitive equipment</td>
<td>Noncorrosive to metal</td>
<td>Extremely irritating and toxic to skin and mucous membranes</td>
</tr>
<tr>
<td></td>
<td>Most commonly used for spuds, lacrimal dilators, tweezers, Alger brush tips</td>
<td>Active in presence of organic material</td>
<td>Shelf life shortens when diluted (effective for 14 — 30 days depending on formulation)</td>
</tr>
<tr>
<td></td>
<td>Sterilization may be accomplished in 6 – 10 hours</td>
<td></td>
<td>High cost, monitor concentration in reusable solutions</td>
</tr>
<tr>
<td><strong>Hydrogen peroxide</strong></td>
<td>Low level disinfectant (3%) Equipment used for home health care</td>
<td>Strong oxidant</td>
<td>Can be corrosive to aluminum, copper, brass or zinc</td>
</tr>
<tr>
<td></td>
<td>Cleans floors, walls and furnishings</td>
<td>Fast acting, breaks down into water and oxygen</td>
<td>Surface active with limited ability to penetrate</td>
</tr>
<tr>
<td></td>
<td>High level disinfectant (6%) Disinfection of soft contact lenses, tonoprobos</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Higher concentrations used as chemisterilants in specially designed machines for decontamination of heat sensitive medical devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stabilized hydrogen peroxide (0.5%) is used a high level surface disinfectant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### 4.7 Infection Control in the Optometric Office

#### Iodophors
- Intermediate level disinfectant for some equipment (hydrotherapy tanks, thermometers)
- Low level disinfectant for hard surfaces and equipment that does not touch mucous membranes
- Rapid action
- Relatively free of toxicity and irritancy
- Note: Antiseptic iodophors are NOT suitable for use as hard surface disinfectant
- Corrosive to metal unless combined with inhibitors
- Disinfectant may burn tissue
- Inactivated by organic materials
- May stain fabrics and synthetic materials

#### Peracetic acid
- High level disinfectant or sterilant for heat sensitive equipment
- Higher concentrations used as chemical sterilants in specially designed machines for decontamination of heat sensitive medical devices
- Innocuous decomposition (water, oxygen, acetic acid, hydrogen peroxide)
- Rapid action at low temperature
- Active in presence of organic materials
- Can be corrosive
- Unstable when diluted

#### Phenolics
- Low/intermediate level disinfectants
- Clean floors, walls and furnishings
- Clean hard surfaces and equipment that does not touch mucous membranes
- Leaves residual film on environmental surfaces
- Commercially available with added detergents to provide one-step cleaning and disinfecting
- Do not use in baby nurseries
- Not recommended for use on food contact surfaces
- May be absorbed through skin or by rubber
- Some synthetic flooring may become sticky with repetitive use

#### Quaternary ammonium compounds
- Low level disinfectant
- Clean floors, walls and furnishings
- Clean blood spills
- Generally non-irritating to hands
- Usually have detergent properties
- DO NOT use to disinfect instruments
- Non-corrosive
- Limited use as disinfectant because of narrow microbiocidal spectrum
Definitions

**Antiseptics:** chemicals that kill microorganisms on living skin or mucous membranes.

**Bactericidal:** chemical agents capable of killing bacteria. Similarly agents that are virucidal, fungicidal or sporicidal are agents capable of killing these organisms.

**Bacteriostatic:** chemical agents that inhibit the growth of bacteria but do not necessarily kill them.

**Cleaning:** the physical removal of foreign material, e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms. Cleaning generally removes rather than kills microorganisms. It is accomplished with water, detergents and mechanical action. The terms “decontamination” and “sanitation” may be used for this process in certain settings, e.g., central service or dietetics. Cleaning reduces or eliminates the reservoirs of potential pathogenic organisms.

**Critical items:** instruments and devices that enter sterile tissues, including the vascular system. Critical items present a high risk of infection if the item is contaminated with any microorganisms. Reprocessing critical items involves meticulous cleaning followed by sterilization.

**Decontamination:** the removal of disease-producing microorganisms to leave an item safe for further handling.

**Disinfection:** the inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Disinfectants are used on inanimate objects in contrast to antiseptics, which are used on living tissue. Disinfection usually involves chemicals, heat or ultraviolet light. The nature of chemical disinfection varies with the type of product used.

**High level disinfection:** High level disinfection processes destroy vegetative bacteria, mycobacteria, fungi and enveloped (lipid) and non-enveloped (non lipid) viruses, but not necessarily bacterial spores. High level disinfectant chemicals (also called chemical sterilants) must be capable of sterilization when contact time is extended. Items must be thoroughly cleaned prior to high level disinfection.

**Intermediate level disinfection:** Intermediate level disinfectants kill vegetative bacteria, most viruses and most fungi but not resistant bacterial spores.

**Low level disinfection:** Low level disinfectants kill most vegetative bacteria and some fungi as well as enveloped (lipid) viruses (e.g., hepatitis B, C, hantavirus, and HIV). Low level disinfectants do not kill mycobacteria or bacterial spores. Low level disinfectants are typically used to clean environmental surfaces.

**Noncritical items:** those items that do not directly contact the patient, or come in contact with only intact skin but not mucous membranes. Reprocessing of noncritical items involves cleaning and/or low level disinfection.

**Sanitation:** a process that reduces microorganisms on an inanimate object to a level below that of infectious hazard (e.g., dishes and eating utensils are sanitized).
Semi-critical items: devices that come in contact with non-intact skin or mucous membranes but ordinarily do not penetrate them. Reprocessing semi-critical items involves meticulous cleaning followed preferably by high-level disinfection.

Sterilization: the destruction of all forms of microbial life including bacteria, viruses, spores and fungi. Items should be cleaned thoroughly before effective sterilization can take place.

References


4) Spaulding's Classification. Cindy Wigston, Infection Prevention & Control Coordinator/Quality Leader, Orillia Soldier's Memorial Hospital.


6) Best Practices for Cleaning, Disinfection and Sterilization of Medical Equipment/Devices in all Health Care Settings, Provincial Infectious Diseases Advisory Committee (PIDAC), Ministry of Health and Long-Term Care, Published-April, 2006, Reviewed and revised February, 2010. www.health.gov.on.ca/en

First published: April 2011
Revised: February 2013
April 2014
SAMPLE Standard Operating Procedure

Levels of disinfection are commensurate with patient risk factors. When in doubt, use of high level disinfection is recommended.

<table>
<thead>
<tr>
<th>Area</th>
<th>Sub-Area</th>
<th>Device</th>
<th>Level of Disinfection</th>
<th>Freq.</th>
<th>Who</th>
<th>DA</th>
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<tbody>
<tr>
<td>Professional</td>
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<td>Exam Room</td>
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<td></td>
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<td>(↑ disinfection commensurate with patient’s infection)</td>
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<td>Spuds, Alger Brush, Lacrimal Dilators, Cannulas</td>
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<td></td>
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<td>Sinks</td>
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<td>Exam Chair &amp; Unit</td>
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<td>Hand Held Instruments</td>
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<td>Contact Lens Cases</td>
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<td>Frame warmer</td>
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<td>Frames on Display</td>
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<td></td>
<td></td>
<td>Computer Keyboards, Mouse &amp; Telephone</td>
<td>Low</td>
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<td>VISA Device</td>
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<td></td>
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<td>Staples, Tape Dispensers</td>
<td>Low</td>
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<td>Toys</td>
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<td>Door Handles</td>
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<td>Washrooms</td>
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<td></td>
<td>Light Switches</td>
<td>Low</td>
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</tbody>
</table>

Freq. Codes
- 1: After direct patient contact
- 2: End of day
- 3: Weekly
- 4: Monthly

Who
- A: Individuals directly involved in patient care
- B: Designated office staff/cleaning staff

Disinfecting Agent (DA)
- 2% Glutaraldehyde: H 1
- 1:50 bleach: H 2
- 0% H2O2: H 3
- Vine: H 4
- 1:100 bleach: I 5
- 3% H2O2: I 6
- 60 – 90% alcohol: I 7
- Iodine/Povidone: I 8
- Germ. Cleaner: L 9

Effective Date: April 2014
4.8 Collaboration and Shared Care

Description

The term “collaboration” has arisen to describe sharing of care between professionals. Such shared care is usually complementary. It has become apparent that professionals who provide complementary health care services to patients often will find ways to work together to co-manage/share care of patients. This is often beneficial to patients as it may allow better accessibility to the health care system, lower costs to the system and patients and allow more specialized practitioners to devote more time to their area of expertise.

Optometrists collaborate with many health care professionals including other optometrists, ophthalmologists, family physicians, other medical practitioners, nurse practitioners and opticians. This document describes the characteristics and conditions of collaboration as they apply to the profession of optometry.

History

Optometrists have the regulatory obligation to refer patients to an appropriate regulated health professional (RHP) when the patient’s condition and/or treatment is beyond the scope of practice of the optometrist. This has usually resulted in referral to family physicians or ophthalmologists to institute medical and/or surgical care. Various shared care relationships have developed in this regard including glaucoma management (OPR 7.2), cataract surgery (OPR 7.3) and refractive surgery (OPR 7.8). Although these relationships are common, formal arrangements are usually not developed.

The Health Professions Regulatory Advisory Counsel (HPRAC) made recommendations in its New Directions report (2006) that optometrists and physicians develop formal collaborative relationships with opticians regarding the latter professional group providing refractive data to assist in the development of a prescription (OPR 6.3) for vision correction. HPRAC also recommended that optometrists and ophthalmologists develop collaborative relationships with regards to the management of glaucoma patients. (OPR 7.2)

Regulatory Standards

Controlled Acts

The Regulated Health Professions Act (RPHA) identifies 13 controlled acts that may only be performed by members of certain regulated health professions. Optometrists are authorized by the Optometry Act to perform 4 of the 13 controlled acts, as follows:

- communicating a diagnosis identifying as the cause of a person's symptoms, a disorder of refraction, a sensory or oculomotor disorder of the eye or vision system, or a prescribed disease;
- applying a prescribed form of energy;
- prescribing or dispensing, for vision or eye problems, subnormal vision devices,
contact lenses or eye glasses; and
• prescribing a drug designated in the regulation.

The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

2. Exceeding the scope of practice of the profession.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

7. Engaging in the practice of the profession while in a conflict of interest as described in Part II.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

15. Delegating a controlled act in contravention of the Act, the Regulated Health Professions Act, 1991 or the regulations under either of those Acts.

16. Performing a controlled act that the member is not authorized to perform.

17. Permitting, counselling or assisting a person who is under the supervision of a member to perform an act in contravention of the Act, the Regulated Health Professions Act, 1991 or the regulations under either of those Acts.

18. Permitting, counselling or assisting any person who is not a member to perform a controlled act which should be performed by a member

Professional Standard
When an optometrist establishes a collaborative relationship with another RHP, that relationship must be in the best interests of the patient. A formal collaborative relationship will:
• have a verifiable agreement between collaborating professionals which outlines the various responsibilities, accountabilities and exchange of appropriate information for each person;
• ensure that patients fully understand the roles and responsibilities of the professionals involved and any associated fees;
• ensure that patients understand their options for care;
• have a mechanism for conflict resolution amongst all parties; and
4.8 Collaboration and Shared Care

• ensure the collaborating professionals adhere to any applicable standards of practice and conflict of interest regulations for each profession.

Clinical Guideline

Although all health professionals are required to maintain the standards of practice set by their own profession, optometrists entering into formal collaborative relationships should take all necessary steps to ensure that the other professionals involved are competent to perform the necessary procedures and services. This could include:

• ensuring that formal qualifications and provincial licensure exist;
• jointly participating in training/education activities;
• developing a joint quality assurance process; and
• regularly reviewing and revising the collaborative agreement.

Conflict of Interest and Fee Issues

When health professionals collaborate, a potential for various conflicts of interest will develop. These include:

• inappropriate referrals (for example referral to your collaborating professional when another RHP would be more appropriate); and
• fee sharing and/or referral fees.

Optometrists should ensure that any potential conflicts of interest are minimized by ensuring that patients fully understand the roles, responsibilities and fees for each professional.

Responsibility

In a collaborative relationship, the professionals providing care share joint responsibility for the assessments and care provided. The formal collaborative agreement will outline this, but members should ensure that all parties involved have a complete understanding. Although the collaborative agreement would not necessarily be in writing, it should be verifiable to a third party if the question arose. It is expected that collaborating professionals will agree on a process for resolving patient problems. If any inconsistency or irregularity in clinical findings and/or care arise, it is the responsibility of all the professionals involved to ensure that appropriate clinical investigations and treatments are performed, however the prescribing professional should take the leading role in these steps.

First published: May 2009
Revised: April 2014
5. Documentation

5.1 The Patient Record

Description

The Patient Record is comprised of two essential parts: the Patient Health Record, including all clinical documentation, and the Financial Record, summarizing diagnostic and treatment fees charged to and paid by the patient. The record is a legal document, with a purpose of meeting professional regulatory requirements, and shall be available for use in the following College processes: Inquiries, Complaints and Reports, Discipline and Quality Assurance.

Regulatory Standard

Optometrists shall take all reasonable steps necessary (including verification at reasonable intervals) to ensure that records in relation to their practice are kept in accordance with the regulations.

The regulations governing record keeping are contained in O.Reg.119/94, Part IV, s. 7-12 as follows:

PART IV RECORDS

7. (1) A member shall take all reasonable steps necessary to ensure that records in relation to his or her practice are kept in accordance with this Part.  O. Reg. 749/94, s. 3.

(2) Reasonable steps under subsection (1) shall include the verification by the member, at reasonable intervals, that the records are kept in accordance with this Part.  O. Reg. 749/94, s. 3.

8. Every member shall keep a daily appointment record that sets out the name of each patient whom the member examines or treats or to whom the member provides any service.  O. Reg. 749/94, s. 3.

9. (1) Every member shall keep a financial record for each patient.  O. Reg. 749/94, s. 3.

(2) The financial record must include the member’s fees for services and any commercial laboratory costs charged to the member.  O. Reg. 749/94, s. 3.

10. (1) Every member shall keep a patient health record for each patient.  O. Reg. 749/94, s. 3.

(2) The patient health record must include the following:

1. The name and address of the patient and the name of the member who provided the service.

2. The date of each visit of the patient.
3. The name and address of any referring health professional.
4. The patient’s health and oculo-visual history.
5. The clinical procedures used.
6. The clinical findings obtained.
7. The diagnosis, when possible.
8. Every order made by the member for examinations, tests, consultations or treatments to be performed by any other person.
9. Particulars of every referral to or from another health professional.
10. Information about every delegation of a controlled act within the meaning of subsection 27 (2) of the Regulated Health Professions Act, 1991, delegated by the member.
11. Information about a procedure that was commenced but not completed, including reasons for non-completion.
12. A copy of every written consent to treatment.  O. Reg. 749/94, s. 3.

(3) Every part of a patient health record must be dated and have a reference identifying the patient or the patient health record.  O. Reg. 749/94, s. 3.

(4) Every entry in the patient health record must be dated and the person who made the entry must be readily identifiable.  O. Reg. 749/94, s. 3.

(5) Every patient health record shall be retained for at least 10 years following,

(a) the patient’s last visit; or

(b) if the patient was less than 18 years old at the time of his or her last visit, the day the patient became or would have become 18 years old.  O. Reg. 749/94, s. 3.

11. (1) The following are acts of professional misconduct for the purposes of clause 51 (1) (c) of the Health Professions Procedural Code:

1. Allowing any person to examine a patient health record or giving a copy of a document or any information from a patient health record to any person except as required by law or as required or allowed by this section.

2. Failing to provide copies from a patient health record for which the member has primary responsibility, as required by this section.  O. Reg. 749/94, s. 3.

(2) A member shall provide copies from a patient health record for which the member has primary responsibility to any of the following persons on request:

1. The patient.

2. A personal representative who is authorized by the patient to obtain copies from the record.

3. If the patient is dead, the patient’s legal representative.

4. If the patient lacks capacity to give an authorization described in paragraph 2,
5.1 The Patient Record

- a committee of the patient appointed under the Mental Incompetency Act,
- a person to whom the patient is married,
- a person, with whom the patient is living in a conjugal relationship outside marriage, if the patient and the person,
  - have cohabited for at least one year,
  - are together the parents of a child, or
  - have together entered into a cohabitation agreement under section 53 of the Family Law Act,
- the patient’s son or daughter,
- the patient’s parent. 0. Reg. 749/94, s. 3; O. Reg. 390/06, s. 1.

(3) It is not an act of professional misconduct under paragraph 2 of subsection (1) for a member to refuse to provide copies from a patient health record until the member is paid a reasonable fee.

(4) A member may provide copies from a patient health record for which the member has primary responsibility to any person authorized by or on behalf of a person to whom the member is required to provide copies under subsection (2).

(5) A member may, for the purposes of providing health care, allow a health professional to examine the patient health record or give a health professional a copy of a document or any information from the record. 0. Reg. 749/94, s. 3.

12. For record keeping required by this Part, a member may use computer, electronic or other equipment for recording, storing and retrieval of records if,

(a) the record keeping system provides ready access by an authorized investigator, inspector or assessor of the College, or the patient or the patient’s representative to the records;

(b) ancillary equipment is readily available for the making of hard copies of the record at no expense to an authorized investigator, inspector or assessor of the College;

(c) the equipment or software being used is such that no amendment, correction, addition or deletion can be made to any record which obliterates the original record or does not show the date of the change. 0. Reg. 749/94, s. 3.

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following act of professional misconduct:

27. If a member closes his or her office or retires from practice, failing to make reasonable efforts to make arrangements with a patient or his or her authorized representative to transfer the patient’s records to,

- the patient or his or her authorized representative,
- another member, if the patient or his or her authorized representative so requests, or
iii. another member, with notice to the patient that his or her records have been transferred to that other member.

Optometrists maintain the information contained within their records in trust, and in compliance with Ontario’s Personal Health Information Protection Act (PHIPA).

Professional Standard

In addition to the regulatory requirements, the patient health record shall also:

• be legible and complete;
• be maintained in either English or French;
• include the date of birth;
• include proposal(s) for care and advice offered;
• include a description of the care rendered and recommendations for ongoing care;
• include details of all patient communication (both in person and electronic);
• be maintained to allow for easy identification and location of all documentation related to the provision of care;
• indicate deviations from usual care due to patient refusal or inability to cooperate; and
• make specific notation in the event that a test was performed or a question asked and the result was ‘negative’ or ‘normal’.

Patient Access to Records

The right of patients to access the information in their record or direct that the information be transferred to another health care provider must not be limited in any manner, except as allowed by regulation. It is the right of patients to choose who provides care to them.

Relocation of a Patient Health Record

In situations where optometrists relocate their practice or entrust the custody of records to another optometrist in another location, optometrists entrusted with the maintenance of the records must make a reasonable attempt to inform patients of the location of the records.

Electronic Records

Members must produce complete financial records and patient health records (as defined by the regulation [O. Reg. 119/94 Part IV, S.12]) upon request.

In addition to the regulatory requirements, optometrists are expected to utilize reasonable and reliable backup systems.

Where patient information is stored on mobile devices or offsite in an identifiable form, the information must be encrypted.

Clinical Guideline

Custodianship of the Patient Health Record

The delivery of quality health care benefits from access to historical clinical information. It is important that optometrists working in a multi-practitioner setting are clear on their rights, responsibilities, and obligations regarding the custodianship of patient health records.

With regard to custodianship of records, optometrists working together should
obtain legal advice to develop a business agreement that articulates the rights, responsibilities, and obligations of each party in the event of a practice break-up.

In the absence of an existing business agreement, the College has adopted the following Guidelines for members:

- **Practice Owner**
  The optometrist is the custodian of the record.

- **Partnerships**
  When two or more optometrists carry on practice in a partnership, the partnership is the custodian of the records. If a partnership dissolves, all partners are equal custodians of all records.

- **Associates**
  In the absence of an agreement, associates have no inherent right to have access to patient information, and the practitioner with primary responsibility for the records is not required to provide patient information to associates if they leave the practice. The practice and the owner(s) of the practice retain custodianship of the records, including clinical and contact information. The patient health record must only be released with the consent of the patient, or as required by law.

- **Cost Sharing Arrangements**
  Where two (or more) members are in a cost sharing arrangement, both optometrists are the custodian of the records they made.

- **Optometry Professional Corporations**
  If a practice is being conducted under an Optometry Professional Corporation, the corporation is the custodian of all the patient health records associated with the practice.

**Electronic Records**

Hardware and software provisions for data protection are often part of the manufacturer’s purchase options. Such protection may vary as follows:

- the safety of the hardware from lightning strikes, hydro brownouts, water damage, theft;

- restriction to access through the use of passwords, the positioning of terminals to restrict the observation of sensitive data by unauthorized people (i.e. the data terminal at the front desk being seen by other patients standing there), and read-only format of data for the protection of its original content;

- a reliable backup through some form of secure off-premises data storage, which may be cloud-based;

- virus and spyware protection; and

- security of patient personal and financial information with any online transactions.

Optometrists should be diligent in maintaining current technology to protect the security of electronic patient data.

College of Optometrists of Ontario documents relevant to this topic are:
Records: Practice Breakup

http://collegeoptom.on.ca/images/pdfs/Records.pdf
5.2 The Prescription

Description
A prescription is a therapeutic directive between an optometrist and a patient. A prescription is based upon the analysis of all available clinical information and subsequent diagnoses from optometric examination. Optometrists may issue two distinct types of prescriptions: **optical prescriptions**, which when combined with further appliance-specific information, enable the patient to obtain eyeglasses, contact lenses or subnormal vision devices; and **prescriptions for drugs**, which specify topical or oral drugs used to treat certain ocular diseases.

Regulatory Standard
The Optometry Act, 1991 (as amended 2007) lists four authorized acts that can be performed by optometrists subject to the terms, conditions and limitations on their certificate of registration. Two of those acts are:

- Prescribing or dispensing, for vision or eye problems, subnormal vision devices, contact lenses or eyeglasses. (1991, c. 35, s. 4*)
- Prescribing drugs designated in the regulations

The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act, 1991) includes the following acts of professional misconduct:

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eyeglasses after the patient’s eyes have been assessed by the member and where such a prescription is clinically indicated.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

The Designated Drugs and Standards of Practice Regulation, (O.Reg. 112/11 under the Optometry Act) describes the following conditions under which optometrists may prescribe drugs:

**Drugs that may be prescribed**

1. For the purposes of paragraph 2.1 of section 4 of the Act, and subject to sections 2, 3 and 4 and Part II of this Regulation, a member may prescribe a drug set out under a category and sub-category heading in Schedule 1.

**Limitation**

2. Where a limitation or a route of administration is indicated in the sub-category heading set out in Schedule 1, a member shall only prescribe a drug listed under that sub-category in compliance with the limitation and in accordance with the route of administration specified.
5.2 The Prescription

Training required

3. No member may prescribe any drug unless he or she has successfully completed the relevant training in pharmacology that has been approved by the Council.

Recording

4. Every time a member prescribes a drug the member shall record the following in the patient’s health record as that record is required to be kept under section 10 of Ontario Regulation 119/94 (General) made under the Act:
   1. Details of the prescription, including the drug prescribed, dosage and route of administration.
   2. Details of the counselling provided by the member to or on behalf of the patient respecting the use of the drug prescribed.

Non-prescription drugs

5. In the course of engaging in the practice of optometry, a member may prescribe any drug that may lawfully be purchased or acquired without a prescription.

Professional Standard

Optometrists issue a prescription only after establishing a professional relationship with the patient, completing an appropriate examination and obtaining a full understanding of the relevant aspects of the patient’s needs, ocular health, refractive status and/or binocular condition. The prescribed therapy must be within the scope of practice of the optometrist and in the patient’s best interest. Optometrists are responsible to counsel their patients in the use of any prescribed therapy and required follow-up. The prescription and appropriate counselling must be documented in the patient record. In the event that a patient experiences an adverse or unexpected response to the prescribed therapy, optometrists will provide additional diagnostic and/or counselling services and, if required, make appropriate modifications to the management plan.

All prescriptions must contain information that:

- Clearly identifies the prescribing optometrist, including name (with degree and profession), address, telephone number, license (registration) number and signature;
- Clearly specifies the identity of the patient; and
- Specifies the date prescribed.

If optometrists determine that a prescribed therapy is required, a prescription must be provided as part of the assessment without additional charge, regardless of whether the examination is an insured or uninsured service.

Patients have the right to fill their prescriptions at the dispensary or pharmacy of their choice.
An optical prescription must also:

- Contain information that is used by a regulated professional to dispense eyeglasses, contact lenses or a subnormal vision device that will provide the required vision correction (OPR 6.3) for the patient; and
- Specify an expiry date.

If optometrists specify an expiry date that is other than as recommended under the Clinical Guideline, information must be communicated to the patient so it is understood why it is not appropriate to fill the prescription after the specified date.

A spectacle prescription (prescription for eyeglasses) must be provided to the patient without request and without additional charge, regardless of whether the examination is an insured or uninsured service. Charges for additional copies of the prescription are at the discretion of the optometrist.

When optometrists have performed the necessary services to prescribe a specific appliance (e.g. contact lens), an appliance-specific prescription including the parameters of that appliance must be provided to the patient upon request. Optometrists may withhold this information pending payment for the related service.

A prescription for drugs must also contain:

- the drug name, dose, dose form;
- directions to the pharmacist such as quantity to be dispensed, refills allowed and an indication if no substitutions are permitted;
- directions to the patient; and
- the optometrist’s original signature.

To provide timely care, it may be necessary to fax a prescription for drugs to a pharmacy. This fax must contain appropriate information verifying that it originates at the prescribing optometrist’s office.

When it is necessary to verbally communicate a prescription for drugs to a pharmacy, the details must be fully documented in the patient record, including the name of the pharmacy and any staff members assisting in the call.

Clinical Guideline

It may be advantageous for optometrists to include additional information on the prescription such as fax and email information and office hours.

Optometrists should consider retaining a copy of every issued prescription with the patient health record (OPR 5.1).

Optical Prescriptions:

Recommended Prescription Expiry for all Optical Prescriptions

<table>
<thead>
<tr>
<th>Patient Age</th>
<th>Expiry</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤ 19</td>
<td>One year</td>
</tr>
<tr>
<td>20 to 64</td>
<td>Two years</td>
</tr>
<tr>
<td>≥ 65</td>
<td>One year</td>
</tr>
</tbody>
</table>
5.2 The Prescription

Spectacle Prescriptions

The spectacle prescription should include all items that are necessary for the preparation of the spectacles. The sphere, cylinder and axis are essential to most spectacle prescriptions. Other elements are essential in some cases: for example, reading addition, prismatic power, bicentric prism, or vertex distance of the refraction.

Appliance-Specific Prescriptions

Clinical justification should exist when a prescription contains appliance-specific information.

Contact Lens Prescriptions

The contact lens (appliance-specific) prescription should include those items necessary for the preparation of contact lenses. These may include lens type, base curve, diameter and power.

Prescriptions for drugs:

Clinical justification should exist when optometrists indicate “no substitutions” for a prescribed medication.

Prescription forms with pre-printed lists of medications should generally be avoided to reduce the possibility of alteration by patients.

Optometrists should consider using clear, modern language to avoid the potential for errors and misinterpretation often found with abbreviations and antiquated Latin abbreviations.

Optometrists should consider reporting medications prescribed for patients to their primary health care provider to enhance the provision and coordination of care.

They should also consider including, where appropriate, a printed recommendation to discard the unused portion of the medication once the treatment is completed.

First Published: September 2007
Revised: April 2011
April 2014
September 2014
April 2015
6. General Procedures

6.1 Anterior Segment Examination

Description
The anterior segment can be considered as the front third of the eye, encompassing the structures in front of (that is, anterior to) the vitreous humour, including, the lids and lashes, conjunctiva and sclera, cornea, anterior chamber, iris, and crystalline lens. The anterior segment examination consists of a thorough assessment of these structures to facilitate the diagnosis of diseases, disorders and dysfunctions of the eye and vision system. Information obtained from an anterior segment examination is part of the required clinical information (OPR 4.2).

Regulatory Standard
The Professional Misconduct Regulation (O. Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
Optometrists must be proficient in and equipped for examining the anterior segment. The equipment customarily used for the assessment is the slit-lamp biomicroscope.

A complete anterior segment examination must include an inspection of the following anatomical areas:
- lids, lashes and adnexa;
- conjunctiva and sclera;
- tear film;
- cornea, (and corneal thickness when indicated);
- anterior chamber and angle;
- iris; and
- crystalline lens.
All patients will receive an anterior segment examination as a part of initial and ongoing optometric care. Emphasis is given to the evaluation of the anterior chamber angle prior to pupillary dilation and in patients with diagnosed or suspected glaucoma. The optometrist’s decision regarding the frequency and extent of the examination and the specific techniques utilized will be influenced by a patient’s signs, symptoms and risk factors.

An anterior segment examination is an essential component of all contact lens assessments (OPR 6.5).

Clinical Guideline
Gonioscopy, or use of reliable imaging technology, may be employed when a detailed assessment of the anterior chamber angle is required. Additional technologies and techniques are available for specialized assessment, including but not limited to corneal topography, wavefront analysis, specular microscopy, optical coherence tomography, and ultrasound biomicroscopy. Ophthalmic dyes and optical filters are often helpful in diagnosing diseases and disorders affecting the ocular surface.

Additional references relevant to this topic are available on the American Optometric Association website (www.aoa.org):

- Care of the Patient with Primary Angle Closure Glaucoma (CPG 5)
- Care of the Patient with Anterior Uveitis (CPG 7)
- Care of the Patient with Open Angle Glaucoma (CPG 9)
- Care of the Patient with Ocular Surface Disorders (CPG 10)
- Care of the Patient with Conjunctivitis (CPG 11)
- Care of the Contact Lens Patient (CPG 19)
6.2 Posterior Segment Examination

**Description**

The posterior segment can be considered as the back two-thirds of the eye, encompassing the structures behind (that is, posterior to) the crystalline lens, including the vitreous humour, optic nerve head and retina. The posterior segment examination consists of a thorough assessment of these structures to facilitate the diagnosis of diseases, disorders, and dysfunctions of the eye and visual system. Information obtained from a posterior segment examination is part of the required clinical information. (OPR 4.2).

**Examination Procedures**

<table>
<thead>
<tr>
<th>METHOD</th>
<th>CHARACTERISTICS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Direct Ophthalmoscopy</td>
<td>Maximum magnification</td>
</tr>
<tr>
<td></td>
<td>Minimum field of view</td>
</tr>
<tr>
<td>2 Binocular Indirect Ophthalmoscopy</td>
<td>Maximal field of view</td>
</tr>
<tr>
<td></td>
<td>Minimal magnification</td>
</tr>
<tr>
<td></td>
<td>Scleral indentation view</td>
</tr>
<tr>
<td></td>
<td>Minimal range of condensing lens, fixed objective lens</td>
</tr>
<tr>
<td>3 Monocular Indirect Ophthalmoscopy</td>
<td>Moderate field of view</td>
</tr>
<tr>
<td></td>
<td>Moderate magnification</td>
</tr>
<tr>
<td>4 Slit Lamp Biomicroscopy (slit lamp photography)</td>
<td>High magnification and a very bright light source permit better appreciation of the optic nerve, macula, retinal vessels and other posterior pole structures.</td>
</tr>
<tr>
<td>5 Fundus Photography</td>
<td>Moderate field of view and magnification with a wide range of filters and recording media. Colour, black and white, film or digital recording.</td>
</tr>
<tr>
<td>6 Imaging Technologies</td>
<td>Include:</td>
</tr>
<tr>
<td></td>
<td>• optical coherence tomography (OCT)</td>
</tr>
<tr>
<td></td>
<td>• confocal scanning laser ophthalmoscopy (SLO)</td>
</tr>
<tr>
<td></td>
<td>• scanning laser polarimetry (GDx)</td>
</tr>
<tr>
<td></td>
<td>• multi-spectral imaging</td>
</tr>
</tbody>
</table>

**Regulatory Standard**

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require
such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

Optometrists must be proficient, and equipped (OPR 4.1), to examine the posterior segment.

A complete posterior segment examination must include an inspection of the following anatomical structures:

- vitreous humour
- optic nerve head
- macula and fovea
- retinal vasculature
- retinal grounds including, posterior pole, mid-periphery and where clinically indicated and/or possible, peripheral retina, and ora serrata.

All patients will receive a posterior segment examination as a part of initial and ongoing optometric care. An optometrist’s decision about the frequency of examination, extent of view and methods of examination of the posterior segment, including the use of pharmacological pupillary dilation, will be influenced by a patient’s signs, symptoms and risk factors.

**Pharmacologic Dilation**

*Pharmacologic dilation (OPR 4.4)* of the pupil is generally required for a thorough evaluation of the ocular media and posterior segment. Dilation can also facilitate examination of the anterior segment structures when certain conditions are present or suspected. The results of the initial dilated examination usually indicate the appropriate timing for subsequent pupillary dilation.

The following lists some of the situations/patient symptoms that indicate dilation is required (unless contraindicated) with the informed consent of the patient. These situations/patient symptoms include but are not limited to:

- symptoms of flashes of light (photopsia), onset of or a change in number or size of floaters;
- unexplained or sudden vision change, loss, or distortion (metamorphopsia);
- the use of medication that may affect ocular tissues (including but not limited to hydroxychloroquine, phenothiazine, long-term steroids);
- the presence of systemic disease that may affect ocular tissues (including but not limited to diabetes, hypertension);
- a history of significant ocular trauma, or ocular surgery that increases risk to the posterior segment;
- a history of moderate to high axial myopia;
• when a better appreciation of the fundus is required (including but not limited to choroidal nevus, optic nerve anomaly);
• when the ocular fundus is not clearly visible through an undilated pupil (including but not limited to cataract);
• when there is a known or suspected disease of:
  the ciliary body (including but not limited to melanoma);
  the vitreous (including but not limited to vitreous hemorrhage);
  the optic nerve (including but not limited to glaucoma);
  the macula (including but not limited to age-related macular degeneration);
  the peripheral retina (including but not limited to lattice degeneration).

Optometrists choose the dilating agent after considering the extent of pupillary dilation desired, the patient's health history and clinical ocular characteristics, as well as the implications of expected side effects on the patient's activities and safety.

**Clinical Guideline**

In general, patients should undergo a dilated fundus examination (DFE) upon their initial presentation to a practitioner. DFE should also be performed periodically thereafter as circumstances warrant.

The name and concentration of the dilating agent used and time of instillation should be recorded in the patient record. The procedure(s) used to examine the posterior segment should also be recorded.

Fundus photography and/or other reliable imaging technologies are becoming more common within optometric practice and are meant to complement, but not to replace, the required elements of an oculo-visual assessment (ophthalmoscopy). In many situations they are of great clinical benefit. Practitioners should be familiar with, and be in the position to provide patients with, or refer patients for, such services when indicated.

Additional references relevant to urgent and emergency care are available on the American Optometric Association website ([www.aoa.org](http://www.aoa.org)):

- Care of the Patient with Diabetes Mellitus (CPG 3)
- Care of the Patient with Age-Related Macular Degeneration (CPG 6)
- Care of the Patient with Open Angle Glaucoma (CPG 9)
- Care of the Patient with Retinal Detachment and Peripheral Vitreoretinal Disease (CPG 13)
6.3 Refractive Assessment and Prescribing

Description
Assessing the patient’s refractive error and, where required, prescribing (OPR 5.2) an optical correction is an integral part of optometric care. Assessment methods include objective and subjective techniques.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eye glasses after the patient’s eyes have been assessed by the member and where such a prescription is clinically indicated.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
The process of obtaining required clinical information (OPR 4.2) includes determination of the refractive status and best-corrected visual acuities. When possible, objective and subjective refraction techniques are used to assess the refractive status of the eye, at the initial visit and as clinically indicated thereafter. Cycloplegic refraction is employed when clinically necessary. (OPR 7.6)

Refractive assessment alone does not provide sufficient information to allow an optometrist to issue an appropriate prescription for subnormal vision devices, contact lenses or eyeglasses. The effects of ocular and systemic health conditions, binocular vision status and the occupational and avocational visual environment and demands must also be considered.

The College standard on delegation and assignment (OPR 4.3) and collaboration (OPR 4.8) must be followed when refractive data is obtained from a person to whom the procedure has been assigned, including another regulated health professional (RHP). Specifically, there must be direct supervision of the subjective refractive assessment when this procedure is assigned.
Clinical Guideline

Refraction Techniques

Refraction techniques fall into two broad categories. Objective techniques generally require no decision-making by the patient and include:

- retinoscopy
- auto-refraction
- wave-front assessment

Subjective techniques depend on responses from the patient and may include:

- trial frame methods
- phoroptor methods
- auto-refractor with subjective capability

New and advanced techniques for the assessment of the refractive status of the eye and vision system continue to be developed. It is recommended that optometrists maintain current knowledge of new technologies.

Prescribing for Subnormal Vision Devices, Contact Lenses or Eyeglasses

Although the objective and subjective refractive results are important in formulating a prescription for subnormal vision devices, contact lenses or eyeglasses, the optometrist should consider a number of other factors prior to issuing the prescription including:

- ocular health: A number of ocular health conditions, such as cataract formation (OPR 7.3), may affect the refractive error. These may cause temporary or permanent refractive changes.
- systemic health: Some systemic health conditions may influence the refractive error by circulatory changes and/or osmotic balance of the eye and other parts of the vision system. A common example of this is diabetes (OPR 7.4).
- binocular vision: Binocular vision anomalies, such as accommodative, or convergence dysfunctions or anisometropia, may affect the final prescription. (OPR 6.7)
- occupational and avocational visual environment and demands: Many occupations or avocations have specific visual demands that require patients to view certain working distances on a regular basis or assume certain postures posing specific optical requirements. For example, a computer operator requires specific optical correction for viewing the computer monitor.

First Published: May 2009
Revised: April 2014
6.4 Spectacle Therapy

Description
Optometrists are authorized to dispense spectacles for the treatment of disorders of refraction and/or sensory and oculomotor disorders and dysfunctions of the eye and vision system. The patient must present a valid prescription written by an optometrist or physician.

Regulatory Standard
The Optometry Act (1991) authorizes optometrists to perform the following controlled act:

- Prescribing or dispensing, for vision or eye problems, subnormal vision devices, contact lenses or eye glasses (1991, c.35,s.4).

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act, 1991) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which consent is required by law, without such a consent.

9. Making a misrepresentation with respect to a remedy, treatment or device.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eye glasses after the patient’s eyes have been assessed by the member and where such a prescription is clinically indicated.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

29. Charging or allowing a fee to be charged that is excessive or unreasonable in relation to the professional services performed.

30. Failing to issue a statement or receipt that itemizes an account for professional goods or services to the patient or a third party who is to pay, in whole or in part, for the goods or services provided to the patient.

33. Charging or accepting a fee, in whole or in part, before providing professional services to a patient unless

i. the fee relates to the cost of professional goods to be used in the course of performing the services, or,
the member informs the patient, before he or she pays the fee, of the patient’s right to choose not to pay the fee before the professional services are performed.

**Professional Standard**

**The provision of spectacle therapy involves:**

- Reviewing with the patient any relevant environmental, occupational, avocational, and/or physical factors affecting spectacle wear
- Reviewing the details of the prescription
- Advising the patient regarding appropriate ophthalmic materials
- Taking appropriate measurements (including but not limited to interpupillary distance and segment height) to ensure proper function of the spectacles
- Confirming the suitability of the order and arranging for the fabrication of the spectacles
- Verifying the accuracy of the completed spectacles to ensure that they meet required tolerances
- Fitting or adjusting the spectacles to the patient
- Counselling the patient on aspects of spectacle wear including, but not limited to: the use, expectations, limitations, customary adaptation period and maintenance requirements of the spectacles

The principle of informed consent applies to spectacle therapy with respect to ophthalmic materials, costs and fees.

Patients experiencing unexpected difficulty adapting to new spectacles should be counselled to seek re-examination by the prescriber to assess the appropriateness of the prescription. Optometrists dispensing appliances based on a prescription from another practitioner are expected to ensure that this has been filled appropriately, however they are not responsible for the efficacy or accuracy of that practitioner’s prescription.

**Internet Sites:** Where the internet is used in the provision of spectacle therapy (Appendix I), websites must:

- Comply with College advertising guidelines and relevant paragraphs in the Professional Misconduct regulation (O. Reg. 119/94, Part I under the Optometry Act);
- Identify the website as belonging to or referring to a member registered with the College of Optometrists of Ontario;
- Collect and record patient information in a private and secure manner respecting patient confidentiality;
- Identify the physical location of the clinic/dispensary, including address and city/town, and the hours of operation of the clinic; and
- Include the telephone number to contact the clinic/dispensary.
Expired Prescriptions:
Optometrists must use professional judgment when deciding to provide spectacle therapy to patients with expired prescriptions. Optometrists must advise patients of any appreciated risks and obtain their informed consent before dispensing their expired prescriptions.

Clinical Guideline
In order to advise patients of products appropriate for their specific needs, optometrists are encouraged to maintain up-to-date knowledge with respect to advances in optical products including, but not limited to, lens designs, spectacle lens materials, coatings, tints and frames. Consideration of additional factors may be made in special circumstances:

1. High Refractive Error:
   a. Lens materials with higher refractive indices and/or aspheric designs may be recommended for prescriptions indicating higher refractive error.
   b. A specific size or shape of frame may be selected to better support higher power prescription lenses.
   c. Additional specific measurements may be taken to ensure the effectiveness of the prescription (including but not limited to monocular interpupillary distances, pantascopic tilt, optical centre height and vertex distance).

2. Presbyopia:
   a. Determination of multifocal fitting height may require consideration of specific patient characteristics, such as stature, posture, vocation and avocation.
   b. A specific progressive-addition lens design may be recommended for an individual patient to reduce adaptation difficulties and/or maximize visual performance.
   c. Specialty multifocal lenses, including computer progressive-addition lenses, may be recommended for patients with extensive intermediate and near vision demands.
   d. Specialty vocational lenses may be considered where patients have unique or non-standard vision tasks.

3. Anisometropia:
   a. Special consideration should be given to the effect of base curve and thickness of lenses in affecting the patient’s adaptation to and visual performance with spectacles. Manipulation of such parameters may be made to optimize the effectiveness of the prescription.
   b. Special consideration should be given to vertical prismatic imbalance. Alternative lens designs, such as bicentric grind, may be recommended to the patient.
c. Special consideration should be given to cost and/or cosmetic appearance when choosing the power and optical parameters of a balance lens.

4. Accommodative and Binocular Vision Disorders: (OPR 6.7)
   a. The multifocal style and height prescribed for young children may be altered from standard practices, to maximize the effectiveness of the prescription.
   b. The use of high index lens materials and/or Fresnel prisms may be considered for prism prescriptions.

5. Low Vision Aids: (OPR 6.6)
   a. Spectacle mounted low vision devices, including microscopes, telemicroscopes and telescopes may be provided.
   b. The use of Fresnel prisms and lenses may be considered for special prescriptions.
   c. A specific size or shape of frame may be selected to adequately support the low vision aid.
   d. Adequate counselling and training in the use of the spectacles should be provided to the low vision patient.

6. Safety Requirements:
   a. Occupational safety lenses and frames should meet Canadian Standards Association (CSA) Z94.3 standards.
   b. Sports spectacles and goggles should meet CSA Z94.3 standards.
   c. Impact resistant lenses should be utilized whenever possible. Special consideration should be given to the use of highly impact resistant materials (such as polycarbonate) for children and monocular patients.

7. Other:
   a. Custom frames may be obtained for patients with special needs and/or facial deformities.
   b. A ptosis crutch may be fitted to a spectacle frame to provide support for a ptotic eyelid.

Expired Prescriptions:
Optometrists providing spectacle therapy to patients with expired prescriptions should obtain the express (written) consent of patients.

First published: May 2009
Revised: April 2014
September 2014
October 2015
Spectacle Therapy using the Internet

Professional and Regulatory Standards Interpreted

Introduction
This document describes how optometrists may utilize their website and/or the internet in spectacle dispensing practices, while meeting the standards of practice of the profession. Ophthalmic dispensing is defined as “the preparation, adaptation and delivery” of vision correction, and is a controlled act in Ontario authorized to optometrists, physicians and opticians:

3. Prescribing or dispensing, for vision or eye problems, subnormal vision devices, contact lenses or eye glasses.

Standard of Practice for Spectacle Therapy
Section 6.4 Spectacle Therapy in the Optometric Practice Reference (OPR) describes the professional standards for spectacle therapy. Optometrists providing spectacle therapy must satisfy the following standards, regardless of whether or not technology is used as a tool to facilitate the provision of spectacle therapy to patients:

• Reviewing with the patient any relevant environmental, occupational, avocational, and/or physical factors affecting spectacle wear;

• Reviewing the details of the prescription;

• Advising the patient regarding appropriate ophthalmic materials;

• Taking appropriate measurements (including but not limited to interpupillary distance and segment height) to ensure proper function of the spectacles;

• Arranging for the fabrication of the spectacles;

• Verifying the accuracy of the completed spectacles to ensure that they meet required tolerances;

• Fitting or adjusting the spectacles to the patient;

• Counselling the patient on aspects of spectacle wear including, but not limited to: the use, expectations, limitations, customary adaptation period and maintenance requirements of the spectacles.

Application of the Standard when providing Spectacle Therapy using the Internet

Reviewing factors affecting spectacle wear: Optometrists must review, with patients, factors affecting spectacle wear. This can be done either in-person, or by telephone, video conference, or online questionnaire. If this review is not performed in-person, optometrists should include a precaution for patients that in-person reviews are recommended for individuals with special needs or atypical facial and/or postural features. If optometrists choose specific patient factors by which to limit their internet dispensing services, including, but not limited to, a
specific age range, this should be disclosed on the website where patients can easily find it.

**Reviewing the details of the prescription:** Optometrists must review prescription details. This can be done in-person or using the internet. Optometrists are responsible for confirming the validity and/or veracity of prescriptions and must have a mechanism in place to do so. Prescriptions provided using the internet must be provided in a secure manner and collected in an unaltered form (pdf/image). All prescriptions must contain information that clearly identifies the prescriber (including name, address, telephone number and signature), and specifies the identity of the patient and the date prescribed **(OPR 5.2 The Prescription)**. All prescriptions must include an expiry date.

**Advising the patient regarding appropriate ophthalmic materials:** Optometrists must advise patients regarding appropriate ophthalmic materials. This may be done in-person or by an online algorithm. In the latter scenario, patients must be given clear directions on how to contact the office/optometrist with any questions they may have.

**Taking appropriate measurements:** Optometrists must take appropriate measurements when providing spectacle therapy. These can be done in-person or by computer application. If computer applications are used (in-office or remotely) to determine dispensing measurements, optometrists must be satisfied that the application determines these measurements with equal accuracy to traditional in-person measurements, including the production of supportable evidence should this matter come to the attention of the College.

**Arranging for the fabrication of the spectacles:** Optometrists must review the suitability of patient orders before arranging for the fabrication of spectacles.

**Verifying the accuracy of the completed spectacles:** Optometrists must verify the accuracy of completed spectacles.

**Fitting or adjusting the spectacles to the patient:** Fitting or adjusting the spectacles to patients must be performed in-office and cannot be performed virtually, by tutorial and/or video conferencing. Optometrists providing spectacle therapy will possess the equipment required to fit and adjust spectacles. In-person fitting and adjusting of spectacles provides a final verification and mitigates risk of harm by confirming that patients leave the clinic with spectacles that have been properly verified, fit and adjusted. In-person delivery of spectacles establishes a patient/practitioner relationship in circumstances where patients are new to the clinic and spectacle therapy was initiated through the optometrist’s website.

**Counseling the patient regarding spectacle wear:** Counseling regarding spectacle wear is ongoing and involves in-office, telephone, and/or electronic communications.
Additional Considerations

Delegation: Optometrists who delegate elements of spectacle dispensing (for example, the fitting and adjusting of spectacles) to staff who are not authorized to independently perform the controlled act, must be present in the same physical location as their patient and able to intervene, unless another optometrist is present to provide appropriate delegation (OPR 4.3 Delegation and Assignment).

Most Responsible Dispenser: In collaborative or multi-optometrist practices, where multiple optometrists may participate in dispensing spectacles to an individual patient, the College considers that the last optometrist to provide care, or “touch the patient”, typically the optometrist fitting or adjusting the spectacles, is the most responsible dispenser. This optometrist is responsible for all preceding steps in the dispensing process, as well as the performance of the spectacles and any potential risk of harm to the patient. Similarly, where optometrists practice in working arrangements with opticians, the most responsible dispenser is the last professional to provide care to the patient.

Jurisdiction: Ontario-based optometrists providing care to patients in other jurisdictions (provinces/states) may need to be registered in those jurisdictions and should consult with the appropriate regulatory authorities. Optometrists participating in any aspect of ophthalmic dispensing in Ontario must be registered with the College of Optometrists of Ontario.

The Patient Record: Internet prescriptions and orders must be maintained in the patient record (OPR 5.1 The Patient Record).

Internet Sites: Where the internet is used in the provision of spectacle therapy, websites must:

- comply with College advertising guidelines and relevant paragraphs in the Professional Misconduct regulation (O. Reg. 119/94, Part I under the Optometry Act);
- identify the website as belonging to or referring to a member registered with the College of Optometrists of Ontario;
- collect and record patient information in a private and secure manner respecting patient confidentiality;
- identify the physical location of the clinic/dispensary, including address and city/town, and the hours of operation of the clinic; and
- include the telephone number to contact the clinic/dispensary.

First published: June 2014
Revised: June 2015
6.5 Contact Lens Therapy

Description
Optometrists are authorized to prescribe and dispense contact lenses for the treatment of:

- disorders of refraction, and/or sensory and oculomotor dysfunctions of the eye and vision system, and/or
- diseases/disorders affecting ocular health, and/or
- anatomical, structural and/or cosmetic concerns

The provision of this service to patients involves an initial assessment to determine suitability of patients for contact lens therapy, a determination of the parameters of a contact lens appropriate for patients, and ongoing monitoring of the efficacy of treatment. Contact lenses are classified by Health Canada as a medical device, not a consumer commodity, and should be treated accordingly.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eye glasses after the patient’s eyes have been assessed by the member and where such a prescription is clinically indicated.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
Initial Contact Lens Fitting
Before contact lens fittings, optometrists obtain required clinical information (OPR 4.2) to determine the suitability of patients for contact lens wear. Special emphasis is given to the analysis of:

- the health of the cornea, conjunctiva, lids, tarsal and bulbar conjunctiva, and the integrity of the tear layer;
6. Contact Lens Therapy

• corneal curvature;
• refractive status and visual acuity;
• the effects that contact lens wear may have on the function of the accommodative, oculo-motor and sensory systems; and
• relevant environmental, occupational, avocational, emotional and systemic health factors affecting contact lens wear.

To allow patients to make informed decisions about proceeding with treatment, optometrists provide information about the advantages, risks, limitations, and costs of contact lens wear and on the prognosis for successful treatment. Patients may choose to proceed with the contact lens fitting by their optometrist, or may obtain a copy of the spectacle prescription to be used for contact lens fitting by other qualified practitioners.

In fitting contact lenses, optometrists will determine, by diagnostic fitting or calculation, lenses that are appropriate for their patients. The initial lenses are evaluated on a patient’s eyes and subsequent modifications of the lens parameters are made as required.

Instructions are provided to patients with respect to:
• hygiene;
• lens insertion and removal;
• use of specific lens care products;
• recommended wearing times and replacement schedules;
• normal and abnormal adaptive symptoms;
• contraindications to lens use;
• progress evaluations; and
• appropriate instructions on how and when to access emergency care (OPR 4.6).

Patients are examined during the adaptation period to assess lens performance, adaptation and compliance.

Once optometrists are satisfied that the adaptation process is complete, and that the parameters of the contact lenses are correct, a contact lens prescription can be finalized. Optometrists are entitled to remuneration for all professional services involved in the determination of these prescriptions. At this point, patients have the option of obtaining contact lenses from their optometrist, or requesting a copy of the contact lens prescription in order to obtain contact lenses elsewhere.

Continuing Care
Optometrists provide continuing care to established contact lens patients. In providing continuing care, optometrists:
• maintain a history concerning:
  • the specifications, age and wearing schedule of current contact lenses;
  • the current lens care regime;
  • any adverse reactions associated with contact lens wear; and
• any health or medication changes.

• assess patients to determine if they are achieving acceptable:
  • lens appearance and fit;
  • wearing time;
  • comfort with lenses in place;
  • corneal clarity and integrity;
  • stable corneal curvature;
  • conjunctival and lid appearance;
  • tear characteristics;
  • over-refraction for best visual acuity;
  • spectacle acuity; and
  • compliance with recommendations on lens handling, lens care, lens
    replacement and wearing times.

• identify any problems and counsel patients as necessary.

• provide and implement management plans for any problems identified, making
  recommendations for further care.

Replacement Contact Lens Services
When providing replacement contact lens services, optometrists are responsible
for:
• determining the currency of clinical information and providing diagnostic
  services as required;
• determining the need for alteration of previous lens specifications and
  makes adjustments accordingly;
• advising patients as to the need for and extent of continuing care;
• confirming the parameters of contact lenses as ordered; and
• providing follow-up services as needed.

The College standards on Delegation and Assignment (OPR 4.3) and Collaboration
(OPR 4.8) must be followed when any procedures are assigned, including to another
regulated health professional (RHP).

Internet Sites
Where the internet is used in the provision of contact lens therapy, websites must:
• comply with College advertising guidelines and relevant paragraphs in the
  Professional Misconduct regulation (O. Reg. 119/94, Part I under the Optometry
  Act);
• identify the website as belonging to or referring to a member registered with the
  College of Optometrists of Ontario;
• collect and record patient information in a private and secure manner respecting
patient confidentiality;

- identify the physical location of the clinic/dispensary, including address and city/town, and the hours of operation of the clinic; and

- include the telephone number to contact the clinic/dispensary.

The College standards on Delegation and Assignment (OPR 4.3) and Collaboration (OPR 4.8) must be followed when any procedures are assigned, including to another regulated health professional (RHP).

**Clinical Guideline**

**Frequency**

Patients using contact lenses generally require, at minimum, annual assessments. Frequent monitoring is particularly important for patients on a continuous wear schedule.

**Consent**

Optometrists should obtain informed consent from all patients electing to wear contact lenses.

**Instrumentation**

In addition to the normal complement of required clinical equipment (OPR 4.1), the following may be helpful in contact lens practice:

- instrumentation for the verification of contact lens parameters; and

- instrumentation to assess corneal topography and thickness.

**Special considerations**

Patients using contact lenses require:

- more frequent follow-up examinations;

- counselling regarding the increased risk of potentially sight-threatening complications and precautionary measures for avoiding them; and

- appropriate instructions on how and when to access emergency care (OPR 4.6).

**Management of Adverse Outcomes**

Although infrequent, adverse ocular complications may occur with contact lens wear. Treatment options may include:

- discontinuation of lens wear or modification of wearing schedule;

- modification of lens design, material or care system;

- appropriate ocular or systemic therapy; and/or

- referral (OPR 4.5) to another regulated health practitioner.
Optometrists should maintain current knowledge of contact lens therapy and are encouraged to consult peer-reviewed literature and professionally developed guidelines.

Additional references relevant to this topic are available on the American Optometric Association website (www.aoa.org):

- Care of the Patient with Ocular Surface Disorders (CPG 10)
- Care of the Contact Lens Patient (CPG 19)

College of Optometrists of Ontario documents relevant to this topic are:

- Contact Lens Advisory: Contact Lenses — Questions and Answers

First Published: January 2007
Revised: February 2013
April 2014
September 2014
6.6 Low Vision Assessment and Therapy

Description
Patients are considered visually impaired when best-corrected vision is inadequate for an individual’s daily needs. These patients may benefit from a low vision evaluation. This includes extended evaluation of visual function, review of ocular health and systemic health conditions that may impact visual function, treatment with various optical and/or non-optical low vision aids and/or rehabilitation strategies directed towards specific needs and demands, as well as counselling and education.

The need for a low vision evaluation will generally be determined as the result of specific clinical findings from an optometric examination (see OPR 4.2 - Required Clinical Information). Other possible reasons for conducting a specific low vision evaluation include referral from another practitioner or direct referral from a patient or family member. Repeat or ongoing examinations may be required to determine the response to treatment or to monitor the status of patients with low vision.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eye glasses after the patient’s eyes have been assessed by the member and where such a prescription is clinically indicated.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

24. Failing to make or maintain records in accordance with Part IV.
Professional Standard

A low vision examination generally will include the following components:

- a comprehensive patient history that explores specific visual concerns, risk factors, visual and ocular history, family ocular history, general health history, social history, medications, and vocational/educational/avocational requirements
- a review of the results of the patient's optometric examination, and reassessment, as necessary, of visual acuity at distance and at near, refraction, binocular and oculomotor status, ocular health and the effectiveness of current spectacles and low vision devices
- patient education regarding visual status, treatment options and prognosis.
- management plan individualized for the patient's needs.
- discussion and/or demonstration of potential optical, non-optical, and electronic aids and devices
- Appropriate follow-up, arranged as needed, to assess the effectiveness of treatment and to monitor the visual condition and needs.

Clinical Guideline

Specialized Testing and Considerations

Several specialized or non-standard test procedures may be utilized in a low vision evaluation:

1. Visual acuity
   a. Distance visual acuity charts may include the Feinbloom, Bailey-Lovie, ETDRS and Lea Symbols charts
   b. Near visual acuity charts may include the Lighthouse, ETDRS and MN Read near acuity charts
   c. Specialized techniques, include preferential looking and visually evoked potentials,
   d. The effect on visual acuity of variations in viewing posture, illumination and test distance may be explored

2. Refraction
   a. Objective techniques such as radical retinoscopy, off-axis retinoscopy, and near retinoscopy
   b. Subjective techniques such as trial frame refraction, just-noticeable-difference technique, hand-held Jackson crossed cylinder, stenopaic slit, and multiple pinhole
   c. Refraction techniques may be performed at non-standard distances

3. Ocular Motility and Binocular Vision
   a. Specific testing for ocular motility and binocular vision may be done to
6.6 Low Vision Assessment and Therapy

Evaluate these aspects of vision:

b. Low vision devices designed for monocular or binocular use, or for use in specific positions of gaze, according to binocular status

4. Visual fields
   a. Automated perimetry
   b. Goldmann perimetry
   c. Tangent Screen
   d. Amsler Grid

5. Supplemental tests
   a. Contrast sensitivity testing
   b. Glare testing
   c. Colour vision testing
   d. Electrodiagnostic testing: VEP, ERG, EOG
   e. Micro-perimetry

Management

Management of low vision and severe visual impairment may involve the use of optical aids, electronic and computerized devices and non-optical techniques and training.

**Optical and Electronic aids**

- spectacle lenses
- tints, filters, lens coatings
- hand magnifiers
- stand magnifiers
- microscopes
- telescopes
- telemicroscopes
- prisms
- mirrors
- reverse telescopes and minus lenses
- electronic devices

Complex optical devices may be prescribed, where indicated:

1. Spectacle mounted microscopes and telemicroscopes can enhance near vision
2. Spectacle mounted telescopes can enhance distance vision
3. Prisms, mirrors, reverse telescopes and minus lens systems may be used to expand peripheral visual fields

Effective Date: April 2014
4. Biconvex aspheric lenses and achromatic doublets can reduce glare
5. Electronic devices such as CCTVs, adaptive computer hardware and software and head-mounted devices can be effective for vocational and educational needs
6. The use of lenses, prisms or occlusion can be designed for cases of nystagmus, strabismus, diplopia or substandard binocular vision

Low vision aids may be prescribed for binocular, biocular or monocular viewing. Instructions and training for the proper use and maintenance of aids and devices is necessary.

Non-optical Aids and Devices
- Lighting, reading guides, large print materials, audio devices, etc.
- Rehabilitation services involves training the patient to adopt non-standard viewing practices such as:
  - eccentric viewing;
  - vertical or diagonal scanning;
  - blur interpretation; and
  - enhanced saccades and pursuits.

Additional Services
Patients with low vision often benefit from the assistance of other health professionals and accordingly a referral for additional services may be indicated including:

1. Orientation and mobility training
2. Occupational therapy
3. Social and community services
4. Counselling
5. Genetic counseling
6. Surgical consultation

Additional Information and Reference
Additional references relevant to this topic include:

Care of the Patient with Visual Impairment (Low Vision Rehabilitation)
Prepared by the American Optometric Association Consensus Panel on Care of the Patient with Low Vision, revised 2007:

First published: April 2011
Revised: April 2014
6.7 **Binocular Vision Assessment and Therapy**

**Description**

Binocular vision is defined as the ability to maintain visual focus on an object with both eyes, creating a single visual image. Optometrists diagnose and treat both congenital and acquired disorders of binocular vision. Clinically, binocular vision is assessed within an optometric examination (see OPR 4.2 - Required Clinical Information) through investigation of the oculomotor and sensory systems.

**Regulatory Standard**

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

The initial optometric examination (OPR 4.2) will yield enough information to reach a diagnosis or indicate the need for further specific binocular vision assessment. Optometrists must use appropriate examination techniques and instrumentation to reach a diagnosis and will inform patients of any recommended treatment options.

Binocular vision assessment includes:

- appropriate case history;
- refraction and best-corrected visual acuities, including use of cycloplegic (OPR 7.6) agents, when indicated;
- assessment of ocular alignment;
- assessment of ocular motility;
- assessment of saccadic and pursuit function;
- assessment of vergence function;
- assessment of accommodative function;
- assessment of sensory function; and
- consideration of etiology (congenital versus acquired disorders).
Management of binocular vision disorders includes:

- refractive and prismatic corrections;
- amblyopia (OPR 7.12) therapy;
- vision therapy; and/or
- tertiary care referral, including but not limited to surgery and/or imaging, when indicated.

**Clinical Guideline**

The scope of a binocular vision assessment/investigation will depend upon the clinical findings of the initial optometric exam. Many binocular conditions require only an initial diagnosis, followed by periodic re-assessment to ensure stability. Other conditions will require ongoing assessment to monitor changes or treatment progress.

**Patient History**

The patient history may include any or all of the following:

- visual demands of the patient;
- presence or absence of signs or symptoms related to binocular vision dysfunction and their impact on daily activities, including the use of validated questionnaires, when possible;
- a family history of binocular disorders;
- pre and perinatal risk factors;
- history of trauma or exposure to toxins;
- previous medical, ocular or surgical treatments;
- general medical status;
- learning abilities;
- gross and fine motor skills; and
- needs, goals and expectations of the patient (and their family, if applicable).

**Testing Distances and Comitancy**

At a minimum, a baseline binocular vision assessment includes distance and nearpoint testing in primary gaze. Consideration should be given to the evaluation of the binocular status at various additional test distances and positions of gaze.

**Instrumentation and Techniques**

A variety of instruments and techniques may be used for binocular vision evaluation and treatment, including:

- phoropters;
- ophthalmic lenses and prisms;
- polarized and anaglyphic filter instruments including computer based methods;
- various methods to assess comitance, retinal correspondence and the nature of monocular fixation (centred vs. eccentric), often involving the use of after images,
entoptic phenomena, and/or comparison of objective vs. subjective measures of the angle of deviation.

Assessment of Binocular Vision Disorders

Non-Strabismic Disorders
The characteristics of symptomatic orthophorias or abnormal heterophorias, including:

- magnitude and direction of phoria;
- accommodative amplitude, facility and response;
- vergence amplitude and facility;
- fixation disparity and/or associated phoria(s);
- any associated sensory disorders or adaptations.

Ocular Motility Disorders
Non-comitant deviations and nystagmus should be fully described and, where possible, underlying causes determined. Any abnormal sensory or postural adaptations should be documented.

Strabismic Disorders
When strabismus is identified, optometrists should investigate and describe the following for various test distances and positions of gaze:

- magnitude;
- direction;
- frequency;
- laterality; and
- associated sensory disorders or adaptations.

Analysis and Treatment
An analysis of the clinical findings of a binocular vision assessment should include a description or diagnosis and may also include consideration of:

- ocular or systemic disease;
- risk of development of amblyopia;
- if known, the etiology of the binocular vision disorder (congenital or acquired);
- refractive error;
- learning abilities;
- patient needs;
- realistic prognosis; and
- referral (if indicated).

Patients with binocular vision disorders vary significantly in their presentations, so each treatment plan should be individualized in consideration of patients' needs and resources.
The treatment plan may include optometric treatment of binocular vision disorders using lenses, prisms and/or vision therapy.

Optometrists should provide counseling with respect to:
- treatment options;
- realistic prognosis; and
- expected duration of treatment and associated costs.

**Referrals for Strabismus Surgery**

Optometrists referring patients for strabismus surgery should provide counseling with respect to risks and benefits.

**Patient Counselling**

Counselling enables patients to make informed decisions about their status and treatment options. Counselling is based upon an appropriate case history, clinical examination and analysis of visual demands.

Presurgical counselling should include, but is not limited to:
- general information including a description of the procedure, expected range of outcomes, normal healing course, and expected postoperative care schedule and procedures;
- benefits\(^1\)\(^-\)\(^4\) including potential improvement in:
  - psychosocial well-being as a result of improved appearance;
  - gross stereopsis; and
  - binocular visual field;
- potential risks\(^2\)\(^-\)\(^7\) including:
  - possible surgical and healing complications;
  - over or under correction;
  - iatrogenic diplopia;
  - potential need for repeated surgeries; and
  - persistent subnormal binocular vision;
- potential need for perioperative vision, refractive and/or prism therapy;
- provider options such as available surgical facilities and surgeons, as well as those qualified to provide preoperative and/or postoperative care;
- practitioner responsibilities so patients are informed of who will provide each aspect of their care; and
- details of any referral (OPR 4.5) to a strabismus surgeon.
Additional references relevant to this topic include:
American Optometric Association (www.aoa.org) Clinical Guidelines:
- CPG-4—Care of the Patient with Amblyopia
- CPG-12—Care of the Patient with Strabismus
- CPG-18—Care of the Patient with Accommodation and Vergence Dysfunction

6.8  Visual Field Assessment

Description
Optometrists may perform an assessment of the field of vision as part of an evaluation of the oculo-visual system. Assessment strategies used may be either screening or detailed (threshold) in nature, utilizing manual or computerized instruments and can be done to assess patients’ central and/or peripheral field of vision. Visual field assessment is used in the diagnosis and monitoring of conditions of the eye and vision system including, but not limited to, glaucoma, neurological and retinal disease, and to fulfil third party reporting requirements. Information obtained from visual field assessment and analysis is part of the patient health record (OPR 5.1) and must be retained.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or health-related purpose in a situation in which a consent is required by law, without such consent

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice for the profession.

Professional Standard
The required clinical information (OPR 4.2) includes the results and analysis of visual field assessment when indicated by patient signs, symptoms or history. The nature of the signs, symptoms or history will determine the test strategy used and the frequency of re-assessment.

Indications for visual field assessment may include, but are not limited to:
- assessment of visual disability
- assessment of patients’ ability to operate a motor vehicle
- unexplained headaches
- unexplained photopsia or other visual disturbances
- use of medications with potential neuro-ophthalmic toxicity
- eyelid or anterior segment anomalies that may affect the visual field
6.8 Visual Field Assessment

- some retinal diseases and abnormalities
- glaucoma or risk factors for glaucoma
- diseases of the optic nerve and visual pathway
- neurological disease

Visual field screening provides a rapid assessment of the sensitivity and/or extent of the visual field to determine if a more detailed evaluation of the visual field is required. Screening strategies include, but are not limited to:

- confrontation methods
- amsler grid
- tangent screen and arc perimeter methods
- automated techniques specifically designed for screening

When a more detailed evaluation is required, it is appropriate to utilize techniques including but not limited to:

- Goldmann perimetry (kinetic and/or static)
- automated threshold perimetry

If optometrists do not have the required instrumentation, arrangements must be in place whereby the appropriate testing will be performed elsewhere in a timely fashion. A requisition for visual field testing must include the visual field test strategy requested and pertinent clinical information. Upon receipt of visual field results, the optometrist providing ongoing care will communicate the results to patients in a timely fashion.

Optometrists accepting requisitions for stand-alone visual field assessments must maintain a patient health record including the requisition information and visual field test results.

Optometrists, accepting referrals and assuming the ongoing care for patients who require visual field testing, must review the results of the patient's optometric and/or medical examination(s) as provided by the referring practitioner, and assess, or re-assess, should any additional clinical information or clarification be necessary.
Clinical Guideline

Macular conditions
Testing of the central visual field is useful in assessing the status and progression of macular pathologies. Self-monitoring using an Amsler grid is often advisable. Threshold testing can also be performed if quantification of abnormalities is desired.

Glaucoma
Early detection of glaucoma may be facilitated by the use of alternative perimetric strategies, including but not limited to frequency doubling technology (FDT). However, threshold perimetry of the central 24 to 30 degrees is usually indicated for the diagnosis and ongoing management of glaucoma. Serial testing to monitor for progression is an integral part of glaucoma diagnosis and management. Patients deemed clinically stable usually require visual field assessment at least once a year. In advanced glaucoma, visual field defects encroaching upon fixation may be monitored through more frequent and detailed central analyses (for example, central 10-degree testing strategies).

Peripheral Field Assessment
Peripheral field assessment may be indicated to:
- fulfil third party reporting requirements;
- evaluate unexplained visual symptoms;
- assess some peripheral retinal pathologies;
- assess neurological conditions.

Kinetic perimetry
Kinetic perimetry is often useful for patients when static methods prove inadequate.

Computerized perimeters will typically archive results; however, optometrists should ensure that effective back-up methods are being utilized and/or hard copies are retained in the patient health record (OPR 5.1).

Additional references relevant to this topic are:
American Optometric Association Clinical Practice Guidelines (www.aoa.org):
- Care of the Patient with Primary Angle Closure Glaucoma (CPG 5)
- Care of the Patient with Open Angle Glaucoma (CPG 9)
7. Specific Diseases, Disorders and Procedures

7.1 Patients with Age-related Macular Degeneration

Description
Age-related Macular Degeneration (AMD) is an acquired retinal disorder that affects central visual function. Nonexudative AMD, also known as “dry” AMD, results in a gradual, progressive loss of central visual functioning, whereas patients with exudative AMD, also known as “wet” AMD, notice a more profound and rapid decrease in central visual functioning.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg.119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
In addition to required clinical information, the evaluation of patients with retinal changes suggestive of AMD, or patients suspected of having AMD, includes:

- patient history of any symptoms associated with AMD; and
- ocular examination including the following:
  - measurement of best corrected monocular visual acuity, distance and near;
  - additional assessment of macular function (for example Amsler grid testing); and
  - posterior segment examination with pupillary dilation (OPR 6.2).

The management of patients with AMD includes:

- continued assessment for differential diagnosis;
- monitoring patients at a frequency that is dependent on the risk of progression of the disease;
- educating patients to be aware of symptoms such as decreased vision, scotoma
and dysmorphopsia by monocular assessment;

- educating patients on the potential benefits of the use of supplements (vitamins, antioxidants) where clinically indicated;
- educating patients on the benefit of lifestyle changes (use of UV protection, cessation of smoking) where indicated;
- instructing patients on the importance of monitoring for the onset of new symptoms between in-office assessments, and to return immediately for assessment should they be noted; and
- making a timely referral (OPR 4.5) for treatment assessment for patients suspected of having choroidal neovascularization (CNV), particularly given the advent of anti-vascular endothelial growth factor (anti-VEGF) treatments that may afford an improvement in central vision.

In developing a treatment plan, consideration should be given to the patient’s visual demands and abilities.

**Clinical Guideline**

For patients with macular degeneration examination with a fundus contact lens is useful in assessing the presence of macular edema. The use of advanced techniques to assess macular structure (for example, serial photography and/or optical coherence tomography (OCT)) and/or macular function (for example, microperimetry) may also be helpful in establishing a diagnosis, and/or monitoring disease progression and/or response to treatment.

Some patients may be candidates for low vision rehabilitation including the use of specialized optical devices and training. These patients may benefit from a consultation with a practitioner who has advanced training or clinical experience in low vision. When extensive visual loss occurs, optometrists should also consider referral for rehabilitation, occupational, vocational and independent living counselling services.

Management of patients with AMD may also include:

- home Amsler grid testing;
- education regarding current and emerging treatment options; and/or
- risk counselling for relatives.

Research in the area of macular degeneration is advancing quickly and it is recommended that members stay current with new diagnostic and treatment strategies as they become available.

Additional references relevant to this topic include:

Care of the Patient with Age-Related Macular Degeneration (CPG 6), American Optometric Association (www.aoa.org).

Preferred Practice Pattern – Age-Related Macular Degeneration, American Academy of Ophthalmology (www.aao.org).
7.2 Patients with Glaucoma

Description
Glaucoma* is a clinical term referring to a spectrum of conditions resulting in damage to the optic nerve and progressive reduction in sensitivity within the field of vision. Patients with glaucoma or patients with significant risks of having glaucoma (hereafter referred to as “glaucoma suspects” for consistency with current professional literature) are commonly encountered in optometric practice. Early diagnosis and therapy may reduce the rate of progression of this disease.

When glaucoma develops without an identifiable cause, it is termed primary. Primary open angle glaucoma is the most common form of this disease and may be managed by optometrists with therapeutic qualifications. Glaucoma with an identifiable cause is termed secondary.

Regulatory Standard
The Optometry Act, 1991 states that in the course of engaging in the practice of optometry optometrists are authorized, subject to terms, conditions and limitations imposed on his or her certificate of registration, to perform the following controlled act:

2.1 Prescribing drugs designated in the regulations.

The Designated Drugs and Standards of Practice Regulation (O. Reg. 112/11 under the Optometry Act) describes the following conditions under which an optometrist may prescribe drugs for the treatment of glaucoma:

PART II
STANDARDS OF PRACTICE — GLAUCOMA

Prescribing of antiglaucoma agents

6. It is a standard of practice of the profession that in treating glaucoma a member may only prescribe a drug set out under the category of “Antiglaucoma Agents” in Schedule 1.

*Glaucoma is a clinical term referring to a variety of conditions with the common feature of an optic neuropathy (i.e. glaucomatous optic neuropathy [GON]) characterized by a distinctive loss of retinal nerve fibres and optic nerve changes. GON can develop under a number of circumstances with varying contributions by several known and as yet unidentified risk factors. The clinical term glaucoma is sometimes used when 1 risk factor, intraocular pressure (IOP) is very extreme and GON is impending but not yet present (i.e. acute glaucoma). Glaucoma is often pluralized to reflect the variety of clinical presentations of this optic neuropathy. (Canadian Ophthalmological Society)2.
Open-angle glaucoma

7. (1) Subject to subsection (2) and to section 8, it is a standard of practice of the profession that a member may only treat a patient with glaucoma where the patient has primary open-angle glaucoma the treatment of which is not complicated by either a concurrent medical condition or a potentially interacting pharmacological treatment.

(2) It is a standard of practice of the profession that a member may only treat a patient having open-angle glaucoma, the treatment of which is complicated by either a concurrent medical condition or a potentially interacting pharmacological treatment, in collaboration with a physician with whom the member has established a co-management model of care for that patient and who is,

(a) certified by the Royal College of Physicians and Surgeons of Canada as a specialist in ophthalmology; or

(b) formally recognized in writing by the College of Physicians and Surgeons of Ontario as a specialist in ophthalmology.

Referral to physician or hospital

8. (1) Subject to subsections (2) and (3), it is a standard of practice of the profession that a member shall immediately refer a patient having a form of glaucoma other than primary open angle glaucoma to a physician or to a hospital.

(2) It is a standard of practice of the profession that a member may initiate treatment for a patient having angle-closure glaucoma only in an emergency and where no physician is available to treat the patient.

(3) It is a standard of practice of the profession that a member shall immediately refer any patient being treated in accordance with subsection (2) to a physician or hospital once the emergency no longer exists or once a physician becomes available, whichever comes first.

(4) In this section, "hospital" means a hospital within the meaning of the Public Hospitals Act.

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.
11. Failing to refer a patient to another professional whose profession is regulated under the *Regulated Health Professions Act, 1991* when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

Optometrists must be knowledgeable and competent in the diagnosis and management of glaucoma.

The examination of patients with either glaucoma, or a suspicion of developing glaucoma, must include an appropriate assessment of any patient-specific risk factors. The core considerations for the examination of glaucoma include:

- case history
- measurement of the intraocular pressure
- evaluation and description of the optic nerve head through dilated pupils
  
  (OPR 6.2)
- biomicroscopy examination of the anterior segment and anterior chamber angle
- gonioscopy, when clinically indicated
- investigation of threshold visual fields, when clinically indicated; and
- measurement of central corneal thickness, when clinically indicated.

Members are expected to use instrumentation and techniques consistent with current professional standards of practice.

**Management Options**

For patients with glaucoma or glaucoma suspects, options include:

1. follow-up examinations at suitable intervals

2. drug therapy when indicated:
   
   a. by referral to an ophthalmologist,
   
   b. by an optometrist with authority to prescribe drugs for the treatment of primary open angle glaucoma
   
   c. by an optometrist with authority to prescribe drugs in collaboration *(OPR 4.8)* with an ophthalmologist for the treatment of primary open angle glaucoma when complicated by a concurrent medical condition or potentially interacting pharmacological treatment;
   
   d. by referral to a physician or hospital, for secondary glaucomas
   
   e. the immediate application of drugs in an emergency situation, such as angle-closure glaucoma, where no physician is available, then, immediately refer the patient to a physician or hospital once the emergency no longer
exists or once a physician becomes available, whichever comes first.

Optometrists must discuss the appropriate option(s) with the patient and obtain informed consent.

The management plan must be clearly documented in the patient health record (OPR 5.1)

In summary:

**Optometrists with authority to prescribe drugs are required to refer patients with primary open angle glaucoma to an ophthalmologist if the treatment is complicated by either a concurrent medical condition or a potentially interacting pharmacological treatment. Treatment may be provided in collaboration with an ophthalmologist with whom the member has established a co-management model of care for that patient.**

**Optometrists are required to refer patients with secondary glaucoma to a physician or hospital.**

### Clinical Guideline

**Glaucoma Examination**

The need for and extent of a glaucoma investigation will generally be determined by the identification of patient specific risk factors and/or as the result of specific clinical findings from an optometric examination. Other indications for conducting a glaucoma examination include referral from another practitioner or assessment of a patient currently being treated for the condition. Multiple examinations may be required to confirm a diagnosis or monitor patients at risk of developing glaucoma.

**Frequency**

The frequency of glaucoma examinations depends upon the patient’s clinical presentation, risk factors and the optometrist’s professional judgment. Recommendations from accepted clinical guidelines1,2 and current professional literature should be used as a guide. For example, the Canadian Ophthalmological Society (COS)2 has the following recommendations:

<table>
<thead>
<tr>
<th>Glaucoma Suspects</th>
<th>1 – 2 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Glaucoma</td>
<td>At least every 12 months</td>
</tr>
<tr>
<td>Moderate Glaucoma</td>
<td>At least every 6 months</td>
</tr>
<tr>
<td>Advanced Glaucoma</td>
<td>At least every 4 months</td>
</tr>
</tbody>
</table>

**Evaluation of Patients with Glaucoma or Glaucoma Suspects**
Generally, a comprehensive glaucoma evaluation would include consideration of the following:

1. **History**
   - family history of glaucoma
   - demographics, including race, age, sex
   - medical status and history, including medications, and
   - ocular history, including refractive error and previous corneal surgery and/or trauma.

2. **Measurement of Intraocular Pressure**
   Intraocular pressure should be measured using a reliable, calibrated and disinfected instrument. At this time, the Goldmann applanation tonometer is commonly used and appears to be the most precise when compared to other methods.

   Consideration should be given to recording relevant factors, such as:
   - the effect of pupillary dilation
   - time of day and diurnal variations
   - additional significant clinical features, such as blepharospasm
   - previous corneal surgery,
   - existing corneal disease, scarring or dystrophy
   - high corneal toricity
   - instrument used

3. **Evaluation of the Optic Nerve**
   The optic nerve head should be examined stereoscopically when possible, using a technique that provides sufficient resolution and magnification to accurately assess the following:
   - cup/disc ratio
   - colour
   - depth of cupping
   - visibility of lamina cribrosa
   - neuroretinal rim appearance
   - presence of peripapillary atrophy
   - overall size of disc
   - presence of disc hemorrhages
   
   This evaluation will generally require pupillary dilation.

4. **Analysis of the Visual Field**
   The visual field should be measured using an instrument that has thresholding capabilities. Frequency of testing is individualized for each patient and is based
on risk factors and previous findings (OPR 6.8).

5. **Evaluation of the Anterior Segment and Angle**
The anterior segment should be evaluated initially and periodically as indicated for risk factors such as pseudoexfoliation, pigment dispersion, iris transillumination defects, and narrow or anomalous anterior chamber angles. Biomicroscopy and gonioscopy are generally the preferred methods of examination.

6. **Measurement of the Corneal Thickness (Pachymetry)**
Corneal thickness is an independent risk factor for the development of glaucoma. Corneal thickness should be measured using a reliable, calibrated and disinfected instrument and recorded.

Risk factors are assessed at subsequent visits as clinically indicated.

**Additional Considerations**

1. **Specialized Visual Field Testing and Analysis**
Specialized forms of visual field testing, such as frequency doubling or blue-yellow perimetry, may be useful in detecting visual field loss at an earlier stage. Analysis software programs may also be helpful, particularly in identifying and assessing changes in the visual fields over time.

2. **Imaging of the Optic Nerve and/or the Nerve Fiber Layer**
Imaging and computer-assisted evaluation of the optic nerve and nerve fiber layer may aid in early diagnosis, analysis of progression and management of glaucoma. Examples include fundus photography, optical coherence tomography (e.g. OCT), confocal scanning laser ophthalmoscopy (e.g. HRT), and laser polarimetry (e.g. GDx).

3. Exploration of other influential factors, such as blood pressure, cardiovascular health, high myopia, migraines, blood transfusions.

**Treatment**

**General considerations**
The therapeutic management of primary open angle glaucoma is within the scope of practice of optometrists with therapeutic qualifications (OPR 4.4). The treatment should adhere to accepted clinical guidelines and current literature. Comprehensive guidelines are available from: the Canadian Ophthalmological Society, the American Optometric Association, American Academy of Ophthalmology and the European Glaucoma Society. Consideration should be given to:

- severity and rate of progression of the disease
- pre-treatment intraocular pressure and diurnal influence
- target intraocular pressure
- barriers to compliance and appropriate administration of treatment (i.e. dexterity, cognition, finances)
7.2 Patients with Glaucoma

- the age and systemic health status of the patient
- known drug sensitivities, allergies or interactions

Collaboration and Shared Care (OPR 4.8)

There will be situations where the patient’s best interests are served by a collaborative relationship between the optometrist and other consultants (i.e. another optometrist, physician, pharmacist, etc). The recording of information exchanged among all parties in a collaborative care relationship is crucial. Each party, including the patient, should understand the responsibilities and expectations in the collaborative relationship.

Drug Therapy v

Open Angle Glaucoma

- treatment considerations for patients with glaucoma are constantly evolving. It is beyond the scope of this guideline to discuss all considerations; however treatment must be based on current clinical guidelines and research. The table below outlines the major classes, examples, generic names, indications and contraindications of glaucoma medications:

<table>
<thead>
<tr>
<th>Anti-Glaucoma Medication</th>
<th>Trade Name</th>
<th>Generic Name</th>
<th>Conc.(%)</th>
<th>Indications</th>
<th>Contraindications 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Miotics</td>
<td>Isopto-Carpine (&amp; Pilopine H4 4% Gel)</td>
<td>pilocarpine</td>
<td>1, 2, 4</td>
<td>Primary/Chronic Open Angle Glaucoma (POAG/COAG)</td>
<td>Miosis, RD, ocular inflammation, neovascular glaucoma, cataracts</td>
</tr>
<tr>
<td></td>
<td>Carbachol</td>
<td>carbachol</td>
<td>1.5, 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adrenergic Agonists</td>
<td>Iopidine</td>
<td>apraclonidine</td>
<td>0.5</td>
<td>Angle Closure Glaucoma (ACG)</td>
<td>Known sensitivity to any component</td>
</tr>
<tr>
<td></td>
<td>Alphagan P</td>
<td>brimonidine</td>
<td>0.1, 0.15</td>
<td></td>
<td>COPD, bradydcardia, tachyphylaxis</td>
</tr>
<tr>
<td>Beta-Blockers</td>
<td>Timoptic &amp; XE</td>
<td>timolol maleate</td>
<td>0.25, 0.5</td>
<td></td>
<td>Sulfa allergies, Sickle cell disease, renal stones, aplastic anemia</td>
</tr>
<tr>
<td></td>
<td>Betagan</td>
<td>levobunolol</td>
<td>0.25, 0.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Betoptic S</td>
<td>betaxolol</td>
<td>0.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAI’s</td>
<td>Trusopt</td>
<td>dorzolamide</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Azopt</td>
<td>brinzolamide</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Diamox1</td>
<td>acetazolamide</td>
<td>125, 250, 500 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neptazane1</td>
<td>methazolamide</td>
<td>25, 50 mg</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prostaglandins</td>
<td>Xalatan</td>
<td>latanoprost</td>
<td>0.005</td>
<td></td>
<td>Known sensitivity to any component, ocular inflammation</td>
</tr>
<tr>
<td></td>
<td>Travatan</td>
<td>travoprost</td>
<td>0.004</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lumigan</td>
<td>bimatoprost</td>
<td>0.03</td>
<td></td>
<td>As above</td>
</tr>
<tr>
<td>Combos</td>
<td>Combigan</td>
<td>brimonidine + timolol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Duotrim</td>
<td>travoprost + timolol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Xalacom</td>
<td>latanoprost + timolol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Cosopt</td>
<td>dorzolamide + timolol</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1 Oral glaucoma agents for emergency treatment of angle closure glaucoma only.
2 Only significant contraindications are shown on the table. Consult formal drug information for complete listings. Some contraindications are absolute and others are relative. Members must use clinical judgment to assess the risk/benefit of using a drug when a contraindication is present.
Angle Closure Glaucoma

- An attack of angle closure glaucoma is an ocular emergency. A timely referral to a physician or hospital must be made. When it is in the patient's best interest, optometrists should initiate emergency treatment for these patients within their clinical practices using appropriate therapy.

- The following Primary Angle Closure Glaucoma Treatment Flow Chart describes a general management plan of a patient with acute angle closure glaucoma in such an emergency situation.
### 7.2 Patients with Glaucoma

**Primary ACG Treatment Flow Chart**

**Patient History and Examination**

**Assessment and Diagnosis**

**Treatment and Management**

**Immediate Treatment**

- timolol 0.5% q 15 min. x 2
- brimonidine q 15 min. x 2
- pilocarpine 2%
- acetazolamide 500 mg (oral)

Apply corneal indentation

**IOP is <20 mmHg**

- Perform gonioscopy to confirm open angle
- Continue pilocarpine 2% qid
- Continue Timoptic 0.5% bid
- Add Predforte 1% qid

Refer for urgent surgical (LPI) consult.

**IOP is ≥20 mmHg**

**IOP elevated at 1 hour**

- Repeat all topical medications
- Add oral glycerin

Check IOP every 15-30 minutes

**IOP elevated at 2 hours**

- Refer for emergency consult.

**Notes:**

* All treatment is topical unless otherwise indicated.

i. Use betaxolol 0.25% if patient has COPD.

ii. Alternatively, apraclonidine 1% could be used

iii. Use every 15 – 60 minutes up to a total of 2 – 4 doses; if IOP is > 40mm Hg, iris sphincter muscle may be ischemic, so Pilocarpine may not cause miosis until IOP is reduced below this level by other drugs.

iv. Use two 250 mg tablets; avoid if patient has sulphite allergy; if patient has a kidney condition, use 100 mg Neptazane; if nauseated; consider IV Diamox (if hospitalization available)

v. Corneal Indentation in the Early Management of Acute Angle Closure;

K. Masselos, A. Bark, I. Francis, F. Stapleton, August 12, 2008

vi. Dosage 1.5 ml/kg body weight; serve over ice; if nauseated, consider IV Mannitol (if hospitalization available).
7.2

Patients with Glaucoma

7. Specific Diseases, Disorders and Procedures

References and Additional Information

Additional references relevant to this topic include:

1. American Optometric Association Clinical Practice Guidelines
   Care of the Patient with Open Angle Glaucoma
   Care of the Patient with Angle Closure Glaucoma
   (http://www.aoa.org/x4813.xml)

2. Canadian Ophthalmological Society Evidence Based Clinical Practice Guidelines
   for the Management of Glaucoma in Adult Eyes.

3. College of Optometrists of Ontario: Guideline for the Use of Drugs by Optometrists
   (OPR 4.4)

4. Ocular Hypertension Treatment Study (OHTS), National Eye Institute,
   Initial results June 13, 2002.
   http://www.nei.nih.gov/glaucomaeyedrops/

5. Corneal Indentation in the Early Management of Acute Angle Closure; K.
   Masselos, A. Bank, I. Francis, F. Stapelton;
   August 12, 2008.

6. The Canadian Glaucoma Strategy (Draft): R.P. LeBlanc CM, MD, FRCSC,
   Department of Ophthalmology and Visual Sciences, Dalhousie University, Halifax
   N.S.

7. American Academy of Ophthalmology: Preferred Practice Pattern: Primary Open
   Angle Glaucoma Suspect. 2005; San Francisco
   http://www.aao.org/


First published: March 2011
Revised: February 2013
April 2014
Eye Health Council of Ontario Guidelines for the Care of Patients with Glaucoma

In April 2011, following years (indeed, decades) of effort by provincial and national associations, regulators, and practitioners, optometrists in Ontario saw the promulgation of Ontario Regulation 112/11, the Designated Drugs and Standards of Practice Regulation. This landmark legislation allowed optometrists to prescribe topical and oral medications for the treatment of eye disease, and obligated them to do so competently.

To that end, the Eye Health Council of Ontario (EHCO), following the successful development of the Guidelines for the Collaborative Management of Persons with Diabetes Mellitus by Eye Care Professionals (Canadian Journal of Optometry 2011;73(4):26-35), turned its attention to articulating similar guidelines for the management of persons with glaucoma.

These guidelines built upon the Canadian Ophthalmological Society’s Evidence-based Clinical Practice Guidelines for the Management of Glaucoma in the Adult Eye (Can J Ophthalmol 2009;44(supp 1):S1-S54) while recognizing the legislated authority for Ontario optometrists to independently manage patients with primary open-angle glaucoma. Over nearly two years of development and scrutiny by academic and practicing optometrists and ophthalmologists, the guidelines were drafted, debated, revised, rewritten, further debated, and eventually agreed upon.

With greater scope comes greater responsibility, and to that end, EHCO presents the Eye Health Council of Ontario Guidelines for the Care of Patients with Glaucoma.

Background

This document was developed in order to better define models of care for glaucoma suspects and patients with glaucoma in Ontario, given the change in the scope of optometric practice as outlined in Ontario Regulations 111/11 and 112/11, made under the Optometry Act (1994).

There is great variability in the severity and presentation of patients with glaucoma, making it difficult to articulate general guidelines for care applicable to all possible clinical presentations. The ultimate goal of the Guidelines is to increase accessibility and to improve the quality of care provided to these patients.

This Guideline referred to the Canadian Ophthalmological Society Evidence-based Clinical Practice Guidelines for the Management of Glaucoma in the Adult Eye (Can J Ophthalmol, 2009;44(supp 1):S1-S54) for general principles and definitions, and the College of Optometrist of Ontario’s “Standards of Practice – Glaucoma” and “The Designated Drugs and Standards of Practice Regulation”. The Guideline is not intended to restrict scopes of practice or serve as a standard of medical care. Standards of medical care are specific to all the facts or circumstances in an individualized case, and can be subject to change as scientific knowledge and technology advance and as practice patterns evolve.

Principles of Interprofessional Collaboration

The key principles are:
- Patient-centred approach
- Timely access to appropriate eye care professional
- Ongoing commitment to high-quality standards of care
- Evidence-based approach to care
- Collegial relationships
- Effective, clear and timely communication
- Optimal utilization of professional competencies and finite resources
- Duplication of tests and services kept to a minimum

Regulations and Recommendations

Recommendations are presented in context with current optometry regulations in Ontario. These are recommendations only and need to be adapted to the individual circumstances of the clinical presentation, availability of eye care professionals, and resources.

A typical examination for a patient with glaucoma or a glaucoma suspect would include gonioscopy, intraocular pressure (IOP), central corneal thickness, threshold visual fields, and assessment and documentation of the optic nerve and nerve fibre layer. The current “standard” for measuring IOP is Goldmann applanation tonometry.

The accompanying table defines the stages of glaucoma.

Glaucoma Suspects

Optometry Regulation: The Regulation does not address patients considered glaucoma suspects.

STAGING OF THE GLAUCOMA SUSPECT AND PATIENTS WITH GLAUCOMA

<table>
<thead>
<tr>
<th>Stage</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspect</td>
<td>IOP &gt; 21 mm Hg, suspicious disc or cup to disc (C/D) asymmetry of &gt; 0.2, suspicious 24-2 (or similar) VF defect</td>
</tr>
<tr>
<td>Early Glaucoma</td>
<td>Early glaucomatous disc features (e.g. C/D* &lt; 0.65) and/or mild VF defect not within 10 degrees of fixation (e.g. MD better than -6 dB on HVF 24-2)</td>
</tr>
<tr>
<td>Moderate Glaucoma</td>
<td>Moderate glaucomatous disc features (e.g. vertical C/D* 0.7–0.85) and/or moderate VF defect not within 10 degrees of fixation (e.g. MD from -6 to -12 dB on HVF 24-2)</td>
</tr>
<tr>
<td>Advanced Glaucoma</td>
<td>Advanced glaucomatous disc features (e.g. C/D* &gt; 0.9) and/or VF defect within 10 degrees of fixation** (e.g. MD worse than -12 dB on HVF 24-2)</td>
</tr>
</tbody>
</table>

HVF=Humphrey Visual Field Analyzer; MD=mean deviation
* Refers to vertical C/D ratio in an average size nerve. If the nerve is small, then a smaller C/D ratio may still be significant; conversely, a large nerve may have a large vertical C/D ratio and still be within normal limits.
** Also consider baseline 10-2 VF (or similar)

Low Risk Glaucoma Suspects

Glucoma suspects of low risk may be managed by either an optometrist or ophthalmologist. Low risk glaucoma suspects have one of the following:
- IOP > 21 mm Hg
- Suspicious disc or cup to disc (C/D) asymmetry of > 0.2
- Suspicious 24-2 (or similar) VF defect

Glucoma suspects may include:
- Young adult patient with family history but no significant ocular findings
- Ocular hypertensive with pressures in the low- to mid-20s but no other significant ocular findings
- Patients with an anomalous or suspicious disc but no other significant ocular findings

After completion of the initial assessment and the establishment of baseline clinical data, the frequency of follow-up examinations will be left to the discretion of the attending eye care professional, although it is suggested that the patient should be followed at least every two years. At each follow-up visit, stability should be assessed (i.e. are the IOP, optic disc and visual field stable?). In cases where a change in optic disc or visual field is suspected, a confirmatory exam should be performed. If change is confirmed, then the patient should be managed as a patient with early glaucoma.
High Risk Glaucoma Suspects

Glucoma suspects of high risk may be managed by either an optometrist or ophthalmologist, and should be assessed at least annually. High risk glaucoma suspects have one or more of the following, but the variation from the normal is much greater than that seen in low risk suspects:

- IOP > 21 mm Hg
- Suspicious disc or cup to disc (C/D) asymmetry of > 0.2
- Suspicious 24-2 (or similar)VF defect (Can J Ophthalmol. 2009;44 (supp 1):S1-S54)

High risk glaucoma suspects may include:

- IOP in the high 20s and a positive primary family history of glaucoma, but no other significant ocular findings
- Suspicious cupping, thin central corneal thickness, IOP in the low 20s but no other significant ocular findings

A high risk glaucoma suspect requires more frequent evaluations and/or testing following the establishment of baseline clinical data. Patients should be made aware of their risk factors for developing glaucoma, and the rationale to initiate ocular hypotensive therapy should be discussed.

Patients with Early POAG

Patients with early POAG may be diagnosed and managed by either an optometrist or ophthalmologist. Careful baseline data should be established. Follow-up examinations should be at least every 6 months over the following 18 months in order to begin establishing the rate of progression. In general, stable patients should have an IOP assessment at least every 6 months, with visual field and objective optic nerve head assessment at least annually, depending on the clinical presentation.

Patients with Moderate POAG

Patients with moderate POAG may be diagnosed and managed by either an optometrist or ophthalmologist. However, optometrists are encouraged to refer the patient to an ophthalmologist immediately should they have any unresolved concerns over the patient's status. Alternatively, they may consider initiating treatment and referring the patient within a reasonable period of time (for example, 6 months) for consideration of future shared management. Following the establishment of sound baseline data, patients with a stable clinical presentation should have an IOP assessment at least every 6 months, with visual field and objective optic nerve head assessment at least annually, depending upon the clinical presentation. Should a patient with moderate POAG being managed by an optometrist demonstrate disease progression despite optimal medical therapy, the patient should be referred to an ophthalmologist.

Patient with Advanced POAG

Patients with advanced POAG are at significant risk of going blind and should be treated by the most experienced eye care professional available. In light of the frequent need for surgical intervention, an ophthalmologist with expertise in the surgical management of this disease should be responsible for the care of these patients. Should all treatment options be exhausted, a quiet end-stage eye may be more appropriately followed in a shared management arrangement.

IOP, visual fields and objective optic nerve assessment should occur at least every 3 to 6 months until the patient is considered stable. Patients with severe disease are at high risk of visual disability and blindness and should generally be treated more aggressively and followed at more frequent intervals.
than those with earlier disease.

The clinical management of these patients should focus on ensuring stability of the IOP, visual field and optic nerve, adherence to treatment, and tolerance to medications.

Glaucoma Progression
Detecting, and ideally preventing, progression is key to the management of glaucoma.

The following are clinical scenarios of unstable glaucoma patients, taken from the COS Guidelines:

i. IOP criterion: If a patient on glaucoma treatment is not meeting target IOP despite changes being made in their medical management.

ii. Visual field criterion: If a patient on glaucoma treatment demonstrates repeatable, clinically significant and greater than expected change in the visual field, despite changes being made to their target IOP and medical management.

iii. Optic nerve criterion: If a patient on glaucoma treatment demonstrates repeatable, clinically significant and greater than expected change in the appearance of the RNFL or the optic nerve (for example, disc hemorrhage), despite changes being made to their target IOP and medical management.

The COS Glaucoma Guidelines recommend that a correlation between structural and functional changes be sought in suspected progression, even though it is more common for a change to be detected with one or the other independently. At all times, the variability of test results, both for structural and functional assessments, should be kept in mind, along with the existence of both false positive and false negative results.

Shared Management

The Optometry Regulation requires an optometrist to share management with an ophthalmologist for:

(a) POAG complicated by a concurrent medical condition,

(b) POAG complicated by a potentially interacting pharmacological treatment.

In such circumstances there must be clear and documented communication outlining the expectations with respect to disease management, frequency of visits to each eye care professional and criteria for fast-track referral. It is important that the patient understands which clinician is the primary point of contact. This will normally be the optometrist, unless agreed upon by the optometrist and ophthalmologist and communicated to the patient. Repetition of tests should be minimized wherever possible.

Concurrent medical or ocular conditions of note may include but are not limited to:

- If a prostaglandin is to be considered: these agents may be contraindicated if there is intraocular inflammatory disease or a history of cystoid macular edema (CME).

- If a cholinergic is to be considered: these agents may be contraindicated if there is intraocular inflammatory disease, retinal lattice degeneration, retinal tears or retinal detachment.

Potentially interacting pharmacological treatments of note may include:

- If a cholinergic is to be considered: these agents may interact with MAO inhibitors.

Note: the above bullets are not intended to be a comprehensive list in any way.

Recommendations for Shared Management:

- The results of all tests should be communicated between optometrist and ophthalmologist

- This could be as simple as stating: fields stable, no change in RNFL or ONH, IOP 14/15

- All changes in management should be communicated between optometrist and ophthalmologist

- This could include changes in treatment, frequency of visits, and frequency of testing

- All changes in advice to the patient should be communicated between optometrist and ophthalmologist

- This could include timing of medications, and use of punctal occlusion
7.2 Patients with Glaucoma

Any changes in disease status or complications should be communicated between optometrist and ophthalmologist. This could include disease progression, allergic reactions, significant side effects, and development of concurrent disease which may complicate test results (e.g. AMD, cataract).

Secondary Glaucoma

Optometry Regulation:
“[Optometry Regulation: “It is a standard of practice of the profession that a member (optometrist) shall immediately refer a patient having a form of glaucoma other than primary open angle glaucoma to a physician or to a hospital.”]

Recommendation:
Under these circumstances, following the initial referral there should be communication between the ophthalmologist and optometrist with respect to the diagnosis and ongoing management of the patient. The ophthalmologist may assume care of the patient, may recommend active shared management, or may offer to see the patient on an as needed (consultant) basis, specifying that the optometrist continues to provide primary care.

For example, a patient presents with pigment dispersion syndrome, suspicious cupping with a C/D ratio of 0.7, a repeatable nasal step defect, and IOPs of 25mmHg. The optometrist diagnoses the secondary glaucoma, and immediately arranges a referral to an ophthalmologist. The diagnosis is confirmed and a management strategy is developed. At that time, the ophthalmologist may elect to continue caring for the patient, may recommend a shared care paradigm, or may return the patient to the optometrist for continued care while remaining available on an as needed basis. A second possibility involves the optometrist calling the ophthalmologist, and the two agreeing upon an initial therapeutic approach until the ophthalmologist is able to review the patient.

Angle Closure Glaucoma

Optometry Regulation:
“(1) Subject to subsections (2) and (3), it is a standard of practice of the profession that a member (optometrist) shall immediately refer a patient having a form of glaucoma other than primary open angle glaucoma to a physician or to a hospital.

(2) It is a standard of practice of the profession that a member may initiate treatment for a patient having angle closure glaucoma only in an emergency and where no physician is available to treat the patient.

(3) It is a standard of practice of the profession that a member shall immediately refer any patient being treated in accordance with subsection (2) to a physician or hospital once the emergency no longer exists or once a physician becomes available, whichever comes first.

(4) In this section, “hospital” means a hospital within the meaning of the Public Hospitals Act.”

Recommendation:

i. Angle Closure Suspect and Narrow Angles:
An optometrist may monitor narrow angles in patients at risk of eventually developing Angle Closure and/or Angle Closure Glaucoma. The optometrist should refer the patient to an ophthalmologist for consideration of prophylactic iridotomies should there be a risk of the angle becoming occludable.

ii. Primary Angle Closure:
The optometrist should refer the patient to an ophthalmologist.

iii. Primary Angle Closure Glaucoma:
The optometrist should refer the patient to an ophthalmologist.

iv. Acute Angle Closure:
An attack of Angle Closure Glaucoma is an ocular emergency. A timely referral to a physician or hospital must be made. When it is in the patient’s best interest, optometrists

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Narrow Angles: Open but can close under appropriate circumstances; unable to view posterior trabecular meshwork (270°); IOP not elevated.

Primary Angle Closure Suspect: Narrow angles, verified by gonioscopy; no peripheral anterior synechiae; IOP not elevated; no evidence of disease (disc or field).

Primary Angle Closure: Shallow anterior chamber angle in presence of iridotrabecular contact, verified by gonioscopy; peripheral anterior synechiae; elevated IOP; no evidence of disc or field damage.

Primary Angle Closure Glaucoma: Shallow anterior chamber angle in presence of iridotrabecular contact, verified by gonioscopy; peripheral anterior synechiae; elevated IOP; evidence of disc and/or field damage.
should initiate emergency treatment for these patients within their clinical practices using appropriate therapy.²

For an optometrist and ophthalmologist to share the management of patients with Angle Closure and Angle Closure Glaucoma, following treatment by the ophthalmologist, there needs to be clear and documented communication outlining the expectations with respect to disease management, frequency of visits to each eye care professional and criteria for fast-track referral. It is important that the patient understands which clinician is the primary point of contact. This will normally be the optometrist, unless agreed upon by the optometrist and ophthalmologist and communicated to the patient. Repetition of tests should be minimized wherever possible.

**Conclusions**

The legal landscape of glaucoma care in Ontario has changed significantly with the recently expanded scope of practice for optometrists. The glaucoma suspect and patients with primary open angle glaucoma may be independently managed by optometrists. In addition, the amount of shared management between optometrists and ophthalmologists will increase. A patient-centred strategy, with particular attention to the patient’s needs, coupled with frequent and clear communication between patient and practitioner, and between optometrist and ophthalmologist will result in optimum outcomes for patients.

The goal of these Guidelines is to propose a practical, patient-centered approach to the new regulations introduced for optometry. The aim is to maximize the accessibility, quality and safety of care for the patient within the Ontario health care environment, providing them with state of the art glaucoma care. At the same time, the recommendations in this document are meant to minimize duplication of effort and to utilize the available resources appropriately, with a view of achieving a cost-effective model of care for these patients.

*La version française de cet article suivra dans le numéro 3.*

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7.3 Patients with Cataract

Description
The practice of optometry includes the diagnosis, care and, when appropriate, referral of patients with cataract. Optometrists also work in collaborative arrangements (OPR 4.8) providing preoperative and postoperative care to patients requiring cataract surgery.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

7. Engaging in the practice of the profession while in a conflict of interest as described in Part II.

8. Failing to reveal the exact nature of a secret remedy or treatment used by the member following a patient’s request to do so.

9. Making a misrepresentation with respect to a remedy, treatment or device.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

19. Performing a controlled act that the member is not authorized to perform.

Professional Standard
When providing care to patients with cataract, optometrists will:

• have the required knowledge, skill and judgement to diagnose and appropriately manage patients with cataract;
• utilize appropriate instrumentation and techniques to diagnose cataract and identify any ocular or systemic conditions that may complicate the surgical procedure or limit the postsurgical visual outcome. As a minimum, these techniques would include the taking of a thorough ocular and systemic history as well as refraction, slit lamp examination and funduscopic examination;
• counsel patients regarding their visual status and recommend surgical referral when appropriate;
• arrange referral (OPR 4.5) was required;
• disclose to patients any financial interest in a surgical centre to which patients are
7.3 Patients with Cataract

Clinical Guideline
Optometrists should maintain current knowledge about cataract surgery in order to have a general discussion with the patient about treatment options.

Diagnosis
When diagnosing cataract, the patient history will be helpful and may include symptoms such as blurred vision, increased glare and haloes. Refractive shift may be a clinical indication of cataract. Ocular health investigation, including anterior segment examination (OPR 6.1) and posterior segment examination (OPR 6.2) with pupillary dilation, will aid diagnosis and guide treatment options.

Patient Counselling
Counselling enables patients to make informed decisions about their status and treatment options. Counselling is based upon an appropriate case history, clinical examination and analysis of visual demands.

Presurgical counselling should include, but is not limited to:
- general information including a description of the procedure, expected outcomes, normal healing course, and expected postoperative care schedule and procedures;
- benefits including potential improvement in visual acuity;
- potential risks including possible surgical and healing complications, changes in optical quality and potential adaptation problems associated with postsurgical status;
- provider options such as available surgical facilities and surgeons, as well as those qualified to provide preoperative and/or postoperative care;
- practitioner responsibilities so patients are informed of who will provide each aspect of their care; and
- details of any referral (OPR 4.5) to a cataract surgeon.

Counseling may also include additional information such as A-scan technologies, intraocular lens (IOL) options and associated refractive surgical procedures.

If a referral for surgical treatment is indicated, optometrists should ensure appropriate informed consent is obtained.

Postoperative Care Considerations
Optometrists often provide continuing care of patients following cataract surgery and may tailor the continuing care regimen to the needs of the individual patient.

referred;
- comply with the College standards on collaboration/shared care when providing preoperative and/or postoperative care to patients (OPR 4.8); and
- comply with College standards on delegation when performing a controlled act that is outside the scope of practice of optometry. (OPR 4.3)
A typical examination schedule for an asymptomatic patient after uncomplicated surgery may be as follows:

- first day following surgery;
- one week following surgery;
- one month following surgery; and
- thereafter as required.

During follow-up care, the following procedures are typically performed:

- measurement of visual acuity;
- measurement of intraocular pressure; and
- slit-lamp biomicroscopy.

The ocular fundus is typically examined with pupillary dilation at one to three months following surgery. This may be necessary sooner if adverse symptoms arise. A stable refraction can generally be obtained at 4-6 weeks following surgery.

Other Considerations

- any unusual findings or complications should prompt optometrists to adjust their examination schedules and consider consulting with the surgeon about the management of the patient.
- optometrists should arrange for emergency care for any urgent or emergent complications that arise.
- optometrists should ensure that the patient understands how to access emergency care.
- the surgeon will generally provide required pharmaceuticals and/or prescriptions, as well as a schedule for medication use for an uneventful postoperative course. It is advisable to review this schedule with the patient at the postoperative visits in order to ensure proper understanding and compliance with the appropriate regime.
- some portions of the peri-operative care and services associated with cataract surgery may not qualify as insured services under the Ontario Health Insurance Plan and therefore optometrists may charge for these services. The fees are to be established by the individual optometrist, not by the surgical center or any third party. Optometrists should ensure that patients are fully informed of the details of the services and any associated fees.

Reminder Regarding Conflicts of Interest

Optometrists who accept rebates or receive other indirect remuneration or benefits as a result of surgical referral are at risk of allegations of professional misconduct.
7.4 **Patients with Diabetes**

**Description**

Diabetes mellitus (DM) is a very common systemic condition that can have numerous ocular manifestations. While diabetic retinopathy poses the greatest long-term threat to vision for most patients with diabetes, optometrists should also be alert to the development of many other possible complications ranging from transient fluctuations in refractive error and dysfunctions of accommodation and colour vision, to abnormalities in the cornea, iris, lens, vitreous, and optic nerve. Also, oculomotor anomalies may arise from neuropathies affecting the third, fourth, or sixth cranial nerves.

**Regulatory Standard**

The Professional Misconduct Regulation *(O.Reg. 119/94 Part I under the Optometry Act)* includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the *Regulated Health Professions Act, 1991* when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

Due to the high prevalence of ocular manifestations of diabetes and the increasing incidence of retinopathy as the duration of the disease increases, all patients with diabetes require periodic assessment of the eye and vision system. Patients are advised as to the appropriate frequency of such assessments, depending on factors such as the duration of the disease, the nature of the condition (e.g. Type I versus Type II), the quality of blood glucose control, and the clinical findings. The normal complement of required clinical information *(OPR 4.2)* is updated regularly with particular emphasis on a detailed case history and thorough anterior and posterior segment examination with pharmacological pupil dilation. Any abnormalities found are carefully documented in the patient record.

Optometrists should be familiar with the classification and current management standards for the various stages of diabetic retinopathy. *Referral (OPR 4.5)* to an appropriate healthcare professional is required when indicated.
Clinical Guideline

Quality care of patients with diabetes starts with a meticulous and comprehensive case history. The patient history should elicit any visual symptoms such as blurred, distorted, or fluctuating vision, diplopia, flashes/floaters, etc., particularly if they are of recent onset. (Note that a recent onset of such symptoms in patients who deny a previous diagnosis of diabetes may arouse a suspicion of undiagnosed DM and trigger a referral (OPR 4.5) to a physician for appropriate medical testing).

Medical histories should be explored to determine the type and duration of the DM, and management regimes should be reviewed, noting:

- any oral medications taken;
- insulin type and usual dosage, where applicable;
- frequency and usual results of blood glucose self-monitoring; and/or
- recent laboratory values for HbA1c (if available).

This information provides valuable insight into patient compliance with therapeutic regimens and control of the DM, which may affect the development of ocular complications. It is also useful to determine if any history of non-ocular complications of DM such as neuropathy or nephropathy exists. The name of primary care providers should be noted in the record to facilitate communication and coordination of patient care.

In addition to the normal complement of required clinical information (OPR 4.2) to be obtained on each patient, certain supplementary procedures may be useful in some cases, depending on clinical findings. Such procedures may include:

- blood pressure measurement;
- colour vision assessment;
- contrast sensitivity testing;
- assessment of the anterior chamber angle (through gonioscopy or other clinically acceptable technique);
- fundus photodocumentation; and/or
- macular optical coherence tomography.

The presence of any of the following findings should lead optometrists to refer their patients to an ophthalmologist (preferably a fellowship-trained retinal specialist):

- severe non-proliferative diabetic retinopathy (NPDR);
- any proliferative diabetic retinopathy (PDR);
- clinically significant macular edema (CSME);
- neovascularization of the iris (NVI); or
- any unexplained vision loss.

Members should consult The Guidelines for the Collaborative Management of Persons with Diabetes Mellitus by Eye Care Professionals, as developed by the Eye Health Council of Ontario, for further guidance regarding referrals. (Appendix 1)
Loss of Vision

In spite of the treatment interventions available, some patients with diabetes will inevitably experience a permanent loss of visual acuity or functional vision. These patients may benefit from a specialized low vision consultation in which various optical or non-optical aids or other devices may be considered to assist with the independent performance of routine daily tasks. In addition, referral for orientation and mobility training, occupational/vocational consultation, or psychosocial counselling may help some patients to achieve more fulfilling, self-sustaining lifestyles.

Coordination of Care

In view of the multidisciplinary nature of diabetes management, appropriately documented communication with primary care providers and/or other members of the diabetes management team is important for the proper coordination of patient care. Patients should be encouraged to maintain contact with their primary care provider on a regular basis.

Additional references relevant to this topic include:

American Optometric Association (www.aoa.org) Clinical Practice Guidelines:
• Care of the Patient with Diabetes Mellitus (CPG 3)

First Published: January 2007
Revised: June 2012
April 2014
June 2015
Guidelines for the Collaborative Management of Persons with Diabetes Mellitus by Eye Care Professionals

Eye Health Council of Ontario (EHCO)

It has long been clear to those involved in eye health care in Ontario that there is a need for a venue to promote inter-professional collaboration to optimize the provision of eye care and disseminate these concepts to appropriate stakeholders. Approximately six years ago, an informal Eye Care Council was created by the Ontario Association of Optometrists and Ontario Medical Association Section on Ophthalmology for this purpose. This has since evolved into the Eye Health Council of Ontario (EHCO).

The inaugural meeting of EHCO took place on December 3, 2010, following the March 31, 2010 recommendations of the Health Professions Regulatory Advisory Council (HPRAC) Report to the Minister of Health and Long-Term Care on Inter-professional Collaboration Among Eye Care Health Professionals. This report envisioned a Council composed of optometrists and ophthalmologists working together, similar to the innovative model in Nova Scotia, building upon the foundation already established in Ontario.

The mandate of EHCO is to support the provision of accessible, quality eye care to the population of Ontario by ensuring the most effective use of the continuum of eye care professionals in the interests of patient safety, quality of care, and cost-effective delivery.

EHCO will also provide a unified voice for eye care issues at the Ministry of Health and Long-Term Care (MOHLTC), and serve as a mechanism to develop common collaborative guidelines for patient care, and as an ideal atmosphere for inter-professional collaboration outside the regulatory framework. Membership includes seven individuals from both ophthalmology and optometry representing academic, political and regulatory bodies of each profession. Both professions agreed to a governance structure wherein two co-chairs shall oversee the meetings; one chair shall be an optometrist, the other an ophthalmologist. Items require a 2/3 majority vote to be approved by EHCO. The council shall meet four times annually and host an extended meeting once per year, inviting all appropriate stakeholders (i.e. opticians, industry, CNIB, family physicians, etc). There are two observers from each College.

Background

Diabetes is a disease that is growing rapidly in both incidence and prevalence in Ontario (dramatically exceeding the global estimates of the World Health Organization), and poses a major public health challenge on many fronts. More specifically, diabetic retinopathy is the most common cause of new cases of legal blindness in people of working age. Approximately 12% of new cases of blindness are caused by diabetic retinopathy, and people with diabetic retinopathy are 25 to 29 times more likely than the general population to become blind within four years. As many as 20% of patients newly diagnosed with Type 2 Diabetes (90% of cases of diabetes are Type 2), have some evidence of diabetes-related eye disease at the time of diagnosis, and approximately 5% will need immediate treatment to help prevent vision loss. Within seven years of diagnosis, 50% of patients with Type 2 Diabetes will develop diabetes-related changes to the eye. By 15 years, this number increases to as many as 85%, with 25% requiring treatment. Essentially 100% of patients with Type 1 Diabetes will exhibit some diabetes-related eye disease 15 to 20 years after diagnosis. Further, the vascular changes that occur within the eye are predictive of vascular changes occurring elsewhere in the body.

Vision loss from diabetic retinopathy is best treated (and may be prevented) if caught in time. Unfortunately, data from the U.S. and Australia show that 50% of people with diabetes are not receiving regular eye examinations. These numbers are staggering when extrapolated to the approximately three million Canadians currently living with diabetes (one-third of whom are unaware they have diabetes); a number predicted to increase to 3.7 million by 2020.
Canada’s Aboriginal people have a rate of diabetes nearly five times that of non-Aboriginal people, and are at a greater risk for vision loss from diabetes and its ocular complications than any other ethnic group in Canada.5

Eye care providers face a challenge in the management and coordination of care for patients with diabetes. The delivery of eye care must provide cost-effective and efficient use of resources to minimize preventable vision loss.

“Preventing blindness in people with diabetes is uniquely cost-saving and cost-effective. There are few cases in health care that are so self-evident.”

**Effectiveness of current methods of assessment for diabetic retinopathy (DR)**

Assessment plays an important role in early detection and intervention to prevent the progression of diabetic retinopathy (DR). Low vision/blindness is substantially reduced among people with diabetes who receive recommended levels of care.15 Despite the high level of efficacy, and both clinical and cost effectiveness of DR assessment and treatment, problems remain with assessment and treatment compliance. Many people with diabetes do not access regular eye examinations and the barriers that prevent them from attending for assessment are numerous.

Successful distribution of comprehensive guidelines to ophthalmologists and optometrists in many locations have not resulted in any significant impact on management practices for DR and recommendations for assessment and examination have been poorly followed.16,17,18,19

In Canada, only 32% of patients with Type 2 Diabetes meet the Canadian Diabetes Association20,21 guideline-recommended schedule of evaluation for diabetic retinopathy.22 A study that examined assessment patterns in five Canadian provinces has shown that 32% of the population with diabetes had not had an eye examination in the last 2 years and that another 32% had never had an eye examination for DR.23

Factors affecting non-adherence to recommended guidelines are numerous. They include lack of awareness that diabetic retinopathy can lead to blindness or that severe retinopathy can be asymptomatic.24

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*(EHCO cont’d.)*

(College of Physicians and Surgeons of Ontario (CPSO) and College of Optometrists of Ontario (COO). As per HPRAC’s recommendation, a senior representative from MOHLTC participates as an observer on EHCO, providing advice to the Council and information to the Ministry and Minister on Council activities.

The ultimate goal of EHCO is the delivery of accessible, safe, quality eye care by the provider best positioned to do so in their area of the Province. In doing so, wait times will decrease, quality of care will improve, and adverse outcomes will be minimized. The independent professional Colleges (CPSO and COO) will continue to ensure public safety through regulation of their professional members. The Council, through knowledge transfer and cooperative sharing of best practice information, will be positioned to provide valuable information to all participants, including the Ministry, to continually improve the delivery of eye care in Ontario.

On September 23, 2011, the members of the Eye Health Council of Ontario unanimously passed their first inter-professional collaborative guideline, focusing on the care of patients with diabetes mellitus. We trust that these guidelines are an important first step in improving eye health care delivery for patients living with diabetes – and ultimately, for all Ontarians.

Respectfully submitted,

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"Preventing blindness in people with diabetes is uniquely cost-saving and cost-effective. There are few cases in health care that are so self-evident." – JC Javitt, MD, MPH

“Blindness: We Know What It Costs! Now What?”

Cost of Blindness Symposium11
Limited access to eye care professionals, particularly in remote areas\textsuperscript{25,26,27}, can play a significant role. Fear of laser treatment, guilt about poor control causing retinopathy, the inconvenience of regular attendance\textsuperscript{28} and limited personal mobility due to poor overall health and self-reported apathy\textsuperscript{28} may also deter patients from attending assessment appointments.

Primary care provider recommendation about the necessity of a regular eye examination is the most significant predictor of assessment for diabetic retinopathy and once such a recommendation is given, the assessment rate improves.\textsuperscript{29} Thus, all physician/allied health staff encounters with individuals with diabetes should be used as an opportunity for education on the need for regular eye assessment and on risk factors associated with DR.

Evidence\textsuperscript{30} indicates that increasing patient awareness of diabetic retinopathy, improving provider and practice performance, improving healthcare system infrastructure processes to make attendance more convenient for patients, using patient recall systems and better outreach to disadvantaged populations can significantly improve the rates of assessment for diabetic retinopathy.

Any chosen assessment strategy or program needs sufficient resource allocation and access to information technology to ensure comprehensive coverage and compliance with quality-assurance standards.\textsuperscript{31}

### Goal
The goal of these guidelines is to coordinate the services of ophthalmologists, optometrists, family physicians, physician specialists, nurse practitioners and allied health staff in the management of patients with diabetes, thereby ensuring the most effective use of these professionals in the interest of patient safety, quality of care, accessibility and cost effectiveness.

### Roles

**Primary Care Providers:** Family Physician/Physician Specialist/Nurse Practitioner/Allied Health Staff

The first step in preventing ocular complications from diabetes is identifying the population at risk. Primary care providers, including family physicians, are responsible for identifying patients with diabetes and play a key role in the care and treatment process. As the coordinators of patient care, primary care providers should promptly refer any newly diagnosed patient with Type 2 Diabetes for an assessment by an optometrist (or ophthalmologist). Patients over the age of puberty with Type 1 Diabetes need to be referred within five years of their diagnosis with diabetes.

**Pediatric patients with Type 1 Diabetes** should be referred for a comprehensive eye examination once the child has reached the age of 10, or has had diabetes for at least three years. Ideally, an ophthalmologist should perform this initial examination. Once the patient has reached the age of 13, in the absence of retinopathy, the patient should be followed by an optometrist (or ophthalmologist) on an annual basis.

Family physicians also need to ensure that their established patients with either Type 1 or Type 2 Diabetes, but without retinopathy, are assessed by an optometrist (or ophthalmologist) annually. Ideally, each referral would be accompanied by fasting blood glucose and HbA1c levels.

*The above outlined pattern of referral to an optometrist is intended to improve patient access to timely and consistent surveillance for eye disease related to diabetes. While the Eye Health Council would recommend that initial referrals be directed to an optometrist, it is not the intent to restrict direct access to an ophthalmologist through a requirement to first see an optometrist.*

### Recommendations

- Refer any patient newly diagnosed with Type 1 Diabetes within five years of their diagnosis with diabetes for an assessment by an optometrist (or ophthalmologist).
- Refer any patient newly diagnosed with Type 2 Diabetes for an assessment by an optometrist (or ophthalmologist). Patients over the age of puberty with Type 1 Diabetes need to be referred within five years of their diagnosis with diabetes.
- **Pediatric patients with Type 1 Diabetes** should be referred for a comprehensive eye examination once the child has reached the age of 10, or has had diabetes for at least three years. Ideally, an ophthalmologist should perform this initial examination. Once the patient has reached the age of 13, in the absence of retinopathy, the patient should be followed by an optometrist (or ophthalmologist) on an annual basis.

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### Recommendations

- Refer any patient over the age of puberty with Type 1 Diabetes within five years of their diagnosis with diabetes for an assessment by an optometrist (or ophthalmologist).
- Refer any patient newly diagnosed with Type 2 Diabetes for an assessment by an optometrist (or ophthalmologist). Patients over the age of puberty with Type 1 Diabetes need to be referred within five years of their diagnosis with diabetes.
- **Pediatric patients with Type 1 Diabetes** should be referred for a comprehensive eye examination once the child has reached the age of 10, or has had diabetes for at least three years. Ideally, an ophthalmologist should perform this initial examination. Once the patient has reached the age of 13, in the absence of retinopathy, the patient should be followed by an optometrist (or ophthalmologist) on an annual basis.
Patients with Diabetes

this initial examination. Once the patient has reached the age of 13, in the absence of retinopathy, the patient should be followed by an optometrist (or ophthalmologist) on an annual basis.

- At every visit, a patient with diabetes should be asked about their liaison with an optometrist or ophthalmologist to ensure appropriate monitoring.

- As mentioned later in this document, the optometrist and ophthalmologist will ensure that the next regular visit for their patient with diabetes is arranged, and will correspond with all appropriate physicians and allied health staff with ocular updates on the patient.

Optometrist

Optometrists will assess patients according to established protocols (see Specific Recommendation section that follows) for ocular complications of diabetes and should provide a report of the findings at the initial patient encounter, and thereafter when clinically indicated, to the family physician/primary care giver and optometrist. It is helpful to provide an annual update if the patient is being seen more frequently.

All professionals share the common role of ensuring their patients are educated with respect to diabetes in general, and their specific clinical situation.

Initial / Ongoing Assessment

Initiation of assessment in people with Type 1 Diabetes

In Type 1 Diabetes, sight-threatening retinopathy is very rare in the first five years of diabetes or before puberty. However, almost all patients with Type 1 Diabetes develop retinopathy over the subsequent two decades and duration of diabetes is strongly associated with the development and severity of DR.

Based on the available evidence, assessment for diabetic retinopathy in post-pubertal individuals should be initiated within five years of diagnosis.

For pre-pubertal individuals, assessment should be initiated at age 10 or within three years of diagnosis, whichever comes first.

Initiation of assessment in people with Type 2 Diabetes

Duration of diabetes is the strongest risk factor linked to the development of DR. DR risk is continuous with no evident glycemic or blood pressure threshold.

At the time diabetes is diagnosed, up to 3% of patients with diabetes over age 30 have CSME or high-risk DR findings. After a 10-year duration of diabetes, 7% of persons with diabetes were shown to have retinopathy; this number increased to 90% after 25 years. Proliferative disease was found in 20% of patients after 20 years of diabetes. DR prevalence was shown to be lower in patients diagnosed with diabetes after the age of 70 years, and patients with DR had a significantly higher median duration of diabetes (5.0 years) than those without DR (3.5 years).

The interval between the onset of symptoms and diagnosis in patients with Type 2 Diabetes is seven years. Given this and the foregoing information, retinopathy assessment for patients with Type 2 Diabetes should be initiated at the time of diagnosis.

Assessment intervals for people with diabetes

Since 1985, lower rates of progression to PDR and of severe visual loss from DR have been reported. This may reflect an increased awareness of retinopathy risk factors, earlier identification and care for patients with retinopathy as well as
improved glucose, blood pressure, and serum lipids management.47

**Type 1 Diabetes**

The EURODIAB Prospective Complications Study found that diabetes duration, age at onset before age 12 years, and metabolic control were significant predictors of progression, even when adjusted for presence of baseline retinopathy.48

**Specific Recommendations**

**NO RETINOPATHY**

**Type 1 Diabetes**

Available evidence indicates that an annual assessment needs to be performed by an optometrist (or ophthalmologist, or telemedicine screening if those doctors are not accessible).

**Type 2 Diabetes**

In the absence of any DR, assessment intervals of 19 to 24 months, as compared with intervals of 12 to 18 months, are not associated with increased risk of referable retinopathy,49 and biennial screening has been shown to be safe and effective with no person progressing from having no retinopathy to sight-threatening retinopathy in under two years.50 This approach reduces the number of assessments by more than 25%, considerably reducing health costs, strain on resources and relieving patients with diabetes from unnecessary examinations.51 However, screening intervals of more than 24 months are associated with an increased risk of sight-threatening DR.49 The overriding concern, however, is that a move away from annual examinations will result in patients being lost to proper follow-up. This is especially true for people with poor access to care. Given that the current standard of care for people with Type 1 Diabetes is annual examinations, this will be the recommendation of these guidelines for patients with Type 2 Diabetes. Biennial follow-up may be suggested for those patients who can be relied upon to recognize the need for recall after 24 months, or for offices that are able to recall patients effectively at the 2-year mark.

**PREGNANT WOMEN WITH DIABETES**

Before attempting to become pregnant, women with Type 1 or Type 2 Diabetes should undergo an ophthalmic evaluation by an optometrist or ophthalmologist. Repeat assessments should be performed during the first trimester, as needed during pregnancy, and again within the first year postpartum.76 This guideline does not apply to women who develop gestational diabetes, because such individuals are not at increased risk for diabetic retinopathy.

**MINIMAL RETINOPATHY: Mild NPDR**

- Several microaneurysms
- Visual acuity of 6/6 or better (unless other known cause of decreased vision)

Annual follow-up of patients with mild NPDR by an optometrist (or ophthalmologist, or telemedicine screening if those doctors are not accessible).

**MODERATE RETINOPATHY: Moderate NPDR**

- Intraretinal hemorrhages
- Hard exudates
- Nerve fibre layer infarcts/cotton wool spots (CWS)

Consider referral of a patient with moderate NPDR to an ophthalmologist (or retinal specialist) if there is any concern about DME, CSME, or other treatable disease. Assessment of patients with moderate NPDR by an eye care professional (optometrist or ophthalmologist) needs to occur at least every six months.

**SEVERE RETINOPATHY: Severe NPDR**

Severe NPDR includes all features of moderate NPDR, plus any one of the following:

- Intraretinal hemorrhages (≥20 in each of 4 quadrants)
- Venous beading (2 or more quadrants)
- Arteriolar narrowing
7.4 Patients with Diabetes

Intraretinal microvascular abnormalities – IRMA (1 or more quadrant(s))

Very severe NPDR is defined as any 2 of the criteria for severe NPDR.

Referral to a retinal specialist (or ophthalmologist) for possible treatment. Assessment by an ophthalmologist every 2 to 4 months. Once stabilized, the patient requires follow-up by either an optometrist or ophthalmologist (or retinal specialist) so that assessment occurs at least every six months.

DIABETIC MACULAR EDEMA: DME, CSME

Clinically significant macular edema (CSME) is defined as:

- Retinal thickening at or within 500 microns of the fovea
- Hard exudates at or within 500 microns of the fovea (if adjacent retina is thickened)
- Retinal thickening 1 disc diameter or larger if within 1 disc diameter of the fovea

Referral to a retinal specialist (or ophthalmologist) for treatment (laser, IVI). Follow-up by treating ophthalmologist until regression. Once stabilized, the patient requires follow-up by either an optometrist or ophthalmologist (or retinal specialist) so that assessment occurs at least every six months.

Assessment Tools

Patient assessment by both ophthalmologist and optometrist includes a full examination of all ocular structures and a commentary on any diabetes associated ocular complications, rather than only diabetic retinopathy. Clinical examination to detect and assess DR and its severity may be performed with slit lamp biomicroscopy, ophthalmoscopy or retinal photography. It should include measurement of visual acuity, and pupils should normally be dilated for the fundus examination. Adequate sensitivity and specificity in performing the assessments are required for the examiners in all assessment processes. Minimum sensitivity required for DR has been set to 80% or, in the case of repeated examinations that would detect DR missed at earlier examinations, to 60%. Specificity levels of 90-95% and technical failure rates of 5-10% are considered appropriate.

Biomicroscopy

Slit lamp biomicroscopy with a non-contact fundus lens after pupil dilation is the currently accepted standard of practice for DR detection (sensitivity of 87.4% and specificity of 94.4%), and is preferred over direct ophthalmoscopy, which has lower and more variable sensitivity even in the hands of an experienced examiner (sensitivity 56-98%, specificity 62-100%). Training should ensure examiners of sufficient diagnostic accuracy and adequate sensitivity and specificity. Single-field retinal photography or optical coherence tomography are not replacements for a proper dilated retinal examination.

Retinal Photography

Stereoscopic seven-field fundus photography evaluated by a trained grader is the “gold standard” method of detecting DR and has been used in most of the large clinical trials in this area. However, it is costly and time consuming and is used rarely in routine practice. Single-field retinal photography can be useful for documentation and follow-up purposes as a part of a comprehensive examination by an optometrist or ophthalmologist.

Telemedicine

Digital retinal photography is increasingly being used in screening for DR. It is not a substitute for a comprehensive eye examination,
but in circumstances where there is no optometrist or ophthalmologist available, there is level I evidence that it can serve as a screening tool for diabetic retinopathy. Patients identified as having retinopathy through this method should be referred to an optometrist or ophthalmologist for further evaluation and management.58,59,60,61,62,63

Fundus imaging has the additional advantage of being perceived by patients as a valuable educational resource.24 It can be performed with dilated pupils or with non-mydriatic cameras through non-dilated pupils.64 The chosen technology, along with the number of camera fields taken, will influence sensitivity of screening.65

Fluorescein Angiography (FA)
Fluorescein angiography has no role in screening for DR, but is essential in late-stage disease to detect and delineate retinal ischemia. It is an invasive examination with an inherent albeit small risk of significant side effects, some mild and transient, some severe (such as anaphylaxis or cardiac arrest).

Optical Coherence Tomography (OCT)
Optical coherence tomography is a non-contact, non-invasive technique that produces cross-sectional images of the retina and optic disc similar to histological sections. It has an axial resolution of 5 μm with newer instruments and provides qualitative and quantitative data that correlate well with fundus stereophotography or biomicroscopy to diagnose diabetic macular edema. It has good reproducibility and provides accurate measurements of retinal thickness.67,68

OCT appears useful to detect macular thickening in the early stages of diabetic retinopathy in patients with retinopathy and no clinical evidence of macular edema, enabling closer follow-up for early DME.69,70 However, OCT does not help in predicting which eyes with subclinical DME will progress to clinically significant DME.71

OCT is an effective qualitative and quantitative method for detecting early macular thickening and following progression or regression of macular edema over the course of treatment, and has been incorporated as a routine measure in numerous ongoing studies of new treatments for DR.

Current data suggest that there is little reason to routinely obtain OCT in eyes with diabetes and no retinopathy or mild to moderate diabetic retinopathy when clinical examination fails to show macular edema.72 However, OCT should be strongly considered when any change in macular architecture, or any unexplained change in best-corrected acuity, is encountered.

Conclusion
The coordination of health care resources is essential in the care and treatment of patients at risk for ocular complications from diabetes. Timely optometric assessment of newly diagnosed diabetic patients will identify patients at risk for diabetic eye disease. Early intervention and treatment of eye disease through appropriate and timely referral for ophthalmologic care will assist in the preservation of quality vision for patients with diabetes. Inter-professional guidelines and generally accepted management and referral criteria will ensure appropriate coordination of care and the most effective use of health professional resources.

References
7.4 Patients with Diabetes


33. Ibid.


37. Ibid.

7.4 Patients with Diabetes


63. Patra S, Gomm EM, Macipe M, Bailey C. Interobserver agreement between
7.4 Patients with Diabetes


Appendix: Diabetic Retinopathy (DR) Disease Severity Scale

No Apparent Diabetic Retinopathy

Non-proliferative Diabetic Retinopathy (NPDR)
- Mild to moderate NPDR – microaneurysms, intra-retinal hemorrhages, hard exudates, foveal avascular zone abnormalities
- Moderate to severe NPDR – cotton wool spots, venous heading, intra-retinal microvascular abnormalities (IRMA)
- Severe NPDR (4-2-1 rule) – any one of: severe (>20) intra-retinal hemorrhages in each of four quadrants; definite venous heading in two or more quadrants; prominent IRMA in one or more quadrant(s)
- Very severe NPDR – any two of the above criteria
- Neovascularization of the disc – NVD
- Neovascularization elsewhere – NVE

Clinically Significant (Diabetic) Macular Edema (CSME)
- Any retinal thickening within 500 microns of the center of the macula (fovea), or;
- Retinal thickening at least one disc area in size, any part of which is within one disc diameter of the center of the macula (fovea), or;
- Hard exudates within 500 microns of the center of the macula (fovea) with adjacent retinal thickening.

It is important to note that hard exudates are a sign of current or previous macular edema. CSME may be focal (leakage from micro-aneurysms or IRMA) or diffuse (leakage from the underlying capillary bed). CSME is the most common cause of decreased vision and blindness among patients with diabetes, and may occur concurrent with any stage of diabetic retinopathy.

Vitreous/pre-retinal hemorrhage
- Neovascularization of the iris – NVI (anterior segment neovascularization)
7.5 Patients with Hypertension

Description
Hypertension is a common and insidious systemic condition that may contribute to the development of potentially vision-threatening complications. These include, but are not limited to, arteriosclerosis, vascular occlusions and obstructions, retinal hemorrhages, edema, ischemia and neovascularization, optic neuropathies, and oculomotor anomalies arising from neuropathies affecting the third, fourth, or sixth cranial nerves. These findings may indicate a need for systemic medical assessment and intervention in the interest of maintaining the patient’s general health. The need for such intervention may be urgent in some circumstances.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
Due to the high prevalence of ocular manifestations of hypertension, all patients with hypertension require periodic assessment of the eye and vision system. The frequency of such assessments depends on factors such as the history and status of the condition, the clinical findings, and the presence of other cardiovascular risk factors, most commonly dyslipidemia and diabetes. The normal complement of required clinical information is updated regularly with particular emphasis on a detailed case history and a thorough posterior segment examination through dilated pupils (OPR 6.2). Any abnormalities found are carefully documented and the patient’s primary healthcare practitioner (such as family physician, or nurse practitioner) is advised of any findings that may pose a threat to the patient’s ocular or systemic health.

Optometrists are familiar with the fundus signs that are characteristic of hypertensive retinopathy and other signs and symptoms that may arise from vascular complications affecting the eye and vision system secondary to hypertension.
Clinical Guideline
The patient’s medical history should be explored to determine the duration of the condition, any associated visual symptoms and the presence of any complications or other cardiovascular disease. The patient’s management regime should be reviewed, noting:

- any medications taken, with dosages and schedule where applicable;
- frequency and usual results of blood pressure monitoring; and
- any history of other medical interventions, diagnostic procedures or ongoing monitoring related to cardiovascular disease.

The name of the patient’s primary healthcare practitioner should be noted in the record to facilitate communication and coordination of the patient’s care.

In addition to the normal complement of required clinical information to be obtained on each patient, certain supplementary procedures may be useful in some cases, depending on clinical findings. Such procedures may include:

- blood pressure measurement;
- visual field assessment;
- contrast sensitivity testing;
- fundus photography (or other ocular imaging procedures);
- optical coherence tomography (OCT).

Coordination of Care
It is always beneficial, when signs of hypertensive eye disease exist, to send written letters or reports to relevant members of the patient’s health care team and to keep copies of such documentation in the patient’s record.

Additional references relevant to this topic are:

American Optometric Association Clinical Practice Guidelines (www.aoa.org):

- CPG 1 Comprehensive Adult Eye and Vision Examination

First Published: April 2007
Revised: February 2013
June 2014
7.6 Cycloplegic Refraction

Description
Objective and subjective refraction done under cycloplegia can provide useful information in situations where sustained accommodative effort is suspected to be contributing to symptoms or obscuring a full diagnosis of the clinical problem.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

Professional Standard
Cycloplegic refraction is indicated in children and young adults:

• with suspected clinically significant latent hyperopia;
• with unexplained reduced visual acuity;
• with suspected amblyopia; or
• who are at risk of developing amblyopia secondary to accommodative esotropia or asymmetric refractive error.

Cycloplegic refraction is repeated when clinically indicated.

When using cycloplegic agents (OPR 4.4), optometrists will:

• be familiar with the properties of any cycloplegic agents they use;
• counsel patients appropriately regarding the expected effects and anticipated duration of action of the agent; and
• consider the presence of any significant contraindications to the use of a cycloplegic agent prior to instillation (e.g., narrow anterior chamber angle, past history of angle closure attacks or other adverse reactions or hypersensitivities to similar agents, etc.).
Clinical Guidelines

Optometrists will consider performing a cycloplegic refraction for:

- infants, toddlers, preschoolers;
- noncommunicative patients;
- children with behavioural and/or academic performance issues;
- children and young adults with hyperopia, on their first visit, particularly if associated with an eso deviation;
- children and young adults presenting with a strabismus on their first visit, particularly if the direction of the deviation is esotropia;
- patients with variable and inconsistent subjective responses during manifest refraction;
- patients whose symptoms are suspected to be arising from accommodative spasm (i.e., latent hyperopia, pseudomyopia);
- patients whose binocular function is subnormal;
- patients who appear to have a subnormal amplitude of accommodation for their age, or who have other signs or symptoms suggestive of accommodative dysfunction;
- patients who are planning to undergo a surgical procedure that is intended to permanently alter their refractive error; and
- patients whose symptoms seem unrelated to the nature or degree of the manifest refractive error.

The specific cycloplegic agent to use in each case should be selected with the goal of providing adequately deep suppression of accommodation while at the same time minimizing the length of time that the patient will be inconvenienced by blur or excessive photophobia.

The agent selected and specific dosage will be influenced primarily by the age of the patient and secondarily by the degree of iris pigmentation. Patients with darker irides often require a more potent cycloplegic agent or a higher dosage than patients with lighter irides (e.g., two drops separated by a five minute time interval rather than a single drop in each eye).

Cyclopentolate hydrochloride (0.5% and 1% drops) is the most widely used cycloplegic agent available at this time. It provides the best compromise between efficacy and duration of action, with one to two drops of 1% solution producing adequate cycloplegia within 25-30 minutes of instillation and lasting 3-24 hours in the majority of cases.

Atropine (0.5% and 1% concentrations in ointment and drop form, respectively) is advocated by some authorities for the purpose of producing maximal cycloplegia in very young children, but it usually requires administration of the drug up to 3 days before the refraction and its effects are excessively long-lasting.

Tropicamide (0.5% and 1% drops) may also be effective for use in adult patients, offering a rapid onset of action (20-30 minutes) and a short duration (30 minutes...
to 4 hours); however it may not provide a reliable degree and consistency of cycloplegia, especially in patients with dark irides and significant hyperopia. Optometrists need to exercise considerable clinical judgment in interpreting the refractive findings obtained under cycloplegia and prescribing an appropriate refractive correction. The final prescription decision will depend on:

- a comparison of the cycloplegic versus non-cycloplegic refractive findings;
- the patient’s age;
- the patient’s symptoms;
- the degree of hyperopia and/or esophoria; and
- the presence or absence of strabismus.

Properties of common cycloplegic agents that may be used are summarized in the *The Use and Prescribing of Drugs in Optometric Practice (OPR 4.4)*.
7.7 Dilation and Irrigation of the Naso-Lacrimal Ducts

**Description**

Dilation and irrigation of the naso-lacrimal ducts may be used as diagnostic or treatment procedures. These procedures temporarily enlarge the punctal opening to the canaliculi for insertion of occlusion devices and/or the irrigation of material from the canaliculi and the naso-lacrimal ducts and/or to maintain complete patency of the system.

**Regulatory Standard**

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

**Professional Standard**

Members providing this service must be competent in performing this technique and have a thorough understanding of the anatomical features and fluid dynamics of the lacrimal system to determine the location of an obstruction.

- dilation and irrigation of the naso-lacrimal ducts will follow a diagnostic process to determine if the procedure is warranted.
- appropriate infection controls must be used.

**Clinical Guideline**

Signs and symptoms consistent with hyperlacrimation are determined by the patient history and slit lamp examination. Tests such as the fluorescein dye disappearance test for lacrimal outflow deficiency can be helpful in confirming the diagnosis of epiphora.

In dry eye conditions, knowing the patency of the drainage system is essential if hyperlacrimation is present.

First Published: September 2006
Revised: April 2014
7.8 **Shared Care in Refractive Surgery**

**Description**
The term ‘Refractive Surgery’ (RS) is a general term for the various forms of surgery used to correct refractive errors of the eye. This includes techniques that use lasers and other forms of electromagnetic energy, implantable lenses and devices, and incisional techniques. Optometrists provide preoperative and postoperative care to RS patients both in their offices and within surgical centres.

Refractive surgery is one of the situations in which optometrists often participate in a shared care relationship **(OPR 4.8)** with another healthcare practitioner. Shared care arrangements are intended to assist in the delivery of effective, efficient, high quality patient care. This standard and guideline addresses the sharing of responsibilities, the communication of patient information, and the financial arrangements within shared care situations.

**Regulatory Standard**
The Professional Misconduct Regulation (**O.Reg. 119/94 Part I under the Optometry Act**) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

7. Engaging in the practice of the profession while in a conflict of interest as described in Part II.

9. Making a misrepresentation with respect to a remedy, treatment or device.

11. Failing to refer a patient to another professional whose profession is regulated under the **Regulated Health Professions Act, 1991** when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

16. Performing a controlled act that the member is not authorized to perform.

Conflict of Interest (**O. Reg. 119/94 Part II under the Optometry Act**) includes the following conflicts of interest:

3. (1) A member shall not engage in the practice of the profession while the member is in a conflict of interest. **O. Reg. 24/14, s. 1.**

(2) A member is in a conflict of interest where the member,

(a) Has a personal or financial interest that influences or is likely to influence the exercise of the member’s professional expertise or judgment in respect of the treatment or referral of a patient;
(d) accepts a benefit that is related to the member referring a patient to any other person;

(h) shares fees related to the practice of the profession with any person other than,

(i) another member, or

(ii) a member of the College of Physicians and Surgeons of Ontario engaged in the practice of medicine.  O. Reg. 24/14, s. 1.

**Professional Standard**

Optometrists providing care to patients pursuing RS will:

- maintain current knowledge of surgical procedures and competence in delivering the various types of preoperative and postoperative procedures in which they participate;
- acquire the normal complement of required clinical information *(OPR 4.2)*;
- identify preoperative ocular health, binocular, refractive or systemic conditions that may complicate the surgical procedure or limit the postsurgical outcome;
- inform patients of the various risks and benefits of the procedure, their options for care providers and all associated fees;
- make a referral *(OPR 4.5)* to an ophthalmic surgeon that includes relevant history and clinical findings;
- follow postoperative protocols indicated by refractive surgeons;
- disclose to patients any financial interest in a surgical centre to which the optometrist refers the patient; and
- comply with the College standards on collaboration/shared care *(OPR 4.8)* and delegation *(OPR 4.3)*.

**Clinical Guideline**

All optometrists should possess a reasonable degree of knowledge about RS in order to discuss treatment options with patients in general terms.

*The following guidelines apply to members providing pre- and postoperative RS care.*

**Counselling**

The purpose of counselling is to enable patients to make informed decisions about treatment options. Counselling is based upon an appropriate case history and clinical examination. In the case of RS, optometrists share this responsibility with surgeons.

**Preoperative Care Considerations**

- general information, including a description of the procedure, expected outcomes, normal healing course, and expected postoperative care schedule and procedures.
• potential benefits including reduction or elimination of refractive error and need for corrective lenses.
• potential risks and complications including surgical complications, healing complications, optical problems associated with over or under correction, and potential adaptation problems associated with post-surgical status.
• provider options such as available surgical facilities and qualified surgeons, as well as those qualified to provide preoperative and/or postoperative care.
• practitioner responsibilities so patients are informed of who will provide each aspect of their care.

Postoperative Care Considerations

The postoperative care regimen depends upon the surgical procedure and any complications involved:

• in a shared care environment, the results of postoperative assessments are communicated to surgeons.
• any urgent or unexpected complications that arise should be communicated to surgeons in a timely manner.
• any changes to the prescribed postoperative drug regimen should be communicated to surgeons in a timely manner.
• optometrists should ensure that patients understand how to access emergency care.
7.9 Patients with Learning Disability

Description

Learning disability is a condition where a significant discrepancy exists between the potential for learning and the actual academic or vocational achievement. Patients with suspected or recognized learning disability often consult optometrists to determine whether a vision problem could be a contributing factor.

By assessing and managing vision problems associated with learning disability, optometrists act as members of a multidisciplinary team that may also include one or more of the following professionals:

- another optometrist who is proficient in visual information processing (visual perception) evaluation;
- educator;
- psychologist;
- physician;
- occupational therapist;
- audiologist; and/or
- speech-language pathologist.

Regulatory Standard

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

2. Exceeding the scope of practice of the profession.

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation which a consent is required by law, without such a consent.

9. Making a misrepresentation with respect to a remedy, treatment or device.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.
29. Charging or allowing a fee to be charged that is excessive or unreasonable in relation to the professional services performed.

Professional Standard
All patients with suspected or recognized learning disability require initial and periodic assessment of the eye and vision system. The frequency of such assessments depends on factors such as the history and clinical findings, and the visual demands of the patient’s academic /vocational circumstances.

The normal complement of required clinical information (OPR 4.2) is obtained and updated regularly with particular emphasis on a detailed case history and careful refractive assessment (OPR 6.3), and consideration of the need for cycloplegic refraction (OPR 7.6) and binocular vision assessment (OPR 6.6).

Where such services are available, optometrists will provide counsel to patients regarding options for further investigation and/or consultation with another professional, as appropriate under the circumstances. Any notable concerns will be communicated to the appropriate team member.

Clinical Guideline
Evaluation of patients with suspected or recognized learning disability should emphasize a thorough review of case history, visual efficiency skills and possibly visual information processing skills, in addition to the fundamental components of an oculo-visual assessment.

Case History:
A comprehensive case history should include discussion regarding:

- the chief concern or reason for the visit;
- the specific nature of the current learning (and vision) problems;
- the patient’s medical history, including pertinent risk factors for vision problems and learning disability (perinatal events, childhood illnesses, premature birth, etc.);
- the patient’s developmental history, including achievement of milestones for motor, language and social skills;
- family history of eye/vision problems, health conditions, learning difficulties; and
- the patient’s academic/educational/vocational history, including:
  - Previous assessments and interventions by eye care or other professionals
  - Current achievement levels and placement
  - Current interventions by eye care or other professionals.
Visual Efficiency Skills:
Refraction and visual acuity should be assessed using tests appropriate to the patient’s age and ability to give accurate subjective responses. Cycloplegic refraction should be utilized, as needed, to obtain conclusive results.

A comprehensive assessment of binocular vision skills should include evaluation of:
- Saccadic and smooth pursuit eye movements;
- Phoria or Strabismus, at distance and near;
- near point of convergence;
- fusional vergence amplitudes, at distance and near;
- vergence facility;
- amplitude of accommodation;
- accuracy of accommodation (lag);
- relative accommodation;
- accommodative facility;
- fixation disparity; and
- Stereopsis.

Visual Information Processing (Visual Perception):
Additional evaluation of visual processing also may be undertaken, to assess visual perception and its integration with motor, auditory, language and attention skills.

A visual perception assessment should utilize current, age-appropriate, normative-referenced tests in the evaluation of:
- visual Spatial Orientation Skills (Bilateral integration, laterality, and directionality);
- visual Analysis Skills (visual discrimination, visual figure ground perception, visual closure, visual memory, visualization);
- visual-Motor Integration;
- eye-Hand Coordination;
- auditory-Visual Integration;
- visual-Verbal Integration; and
- reading and Spelling.
7.9 Patients With Learning Disability

Treatment:
Although vision problems may be associated with learning difficulties, they are rarely the sole factor. Therefore, specific and problem-oriented treatment goals should be established.

The optometrist should provide counselling with respect to:

• treatment goals and options;
• prognosis;
• expected duration of treatment; and
• associated fees.

Provision of such counselling should be recorded in the patient record. The patient record also should include the details of treatment and follow-up, any changes to the treatment plan, the fees charged, and copies of any written reports or correspondence. Informed consent is obtained prior to treatment.

Optometric treatment of vision problems associated with learning disability is delivered in cooperation with other professionals, and does not replace conventional educational / vocational programming. Interdisciplinary communication, consultation and referral often are necessary, to fully manage the learning disability.

Additional Information
Additional references relevant to this topic include:

• American Optometric Association CPG-20 – Care of the Patient with Learning Disabilities www.aoa.org


First Published: April 2012
Revised: April 2014
7.10 Orthokeratology

**Description**

Orthokeratology (Ortho-K) involves the wearing of specially designed rigid gas permeable (RGP) contact lenses, often overnight, to progressively and temporarily alter the curvature of the cornea. This procedure may be offered by optometrists as an option for vision correction (most commonly myopia and/or astigmatism), and is being investigated for myopia control in children.

**Regulatory Standard**

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation which a consent is required by law, without such a consent.

8. Failing to reveal the exact nature of a secret remedy or treatment used by the member following a patient's request to do so.

9. Making a misrepresentation with respect to a remedy, treatment or device.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

12. Failing, without reasonable cause, to provide a patient with a written, signed and dated prescription for subnormal vision devices, contact lenses or eye glasses after the patient's eyes have been assessed by the member and where such a prescription is clinically indicated.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

15. Delegating a controlled act in contravention of the Act, the Regulated Health Professions Act, 1991 or the regulations under either of those Acts.

22. Publishing or using, or knowingly permitting the publication or use of an advertisement or announcement or information that promotes or relates to the provision of professional services by a member to the public, whether in a document, business card, business sign, website, or any other format, which,

i. is false or deceptive, whether by reason of inclusion or of omission of
information,

ii. suggests that the member is a specialist or is specially educated, trained or qualified other than where the reference is to an educational achievement and the reference has been approved by Council.

v. is not factual, objectively verifiable or readily comprehensible to the persons to whom it is directed.

**Professional Standard**

Optometrists performing Ortho-K must be competent in the fitting of RGP contact lenses and follow the contact lens standards outlined in section 6.5 of the OPR. They must stay abreast of developments in Ortho-K technologies, and consult peer-reviewed literature and professionally developed practice guidelines.

Optometrists must present a realistic prognosis when offering Ortho-K, especially as it pertains to the amount of myopia reduction and/or control possible for patients. The risks, as well as benefits, of corneal reshaping procedures and overnight contact lens wear must be explained to prospective patients and these individuals must be carefully monitored, both through the initial wear phase as well as the retainer wear phase. In addition, patients must be counseled to be compliant with lens care, wearing schedule instructions, and follow-up assessments.

The full complement of required clinical information may not be necessary when providing specific assessments or consultation services for referring optometrists, physicians or nurse practitioners. In such cases, optometrists will determine what is clinically necessary based on the reason for presentation. (OPR 4.2)

Optometrists accepting referrals for Ortho-K must review the results of the referring practitioner’s optometric and/or medical examination(s), and assess, or re-assess the referred patient, should any additional clinical information or clarification be necessary.

Preliminary and ongoing examination follows the standards articulated in Contact Lens Therapy (OPR 6.5), and also includes:

- refraction and visual acuities (unaided and best corrected)
- corneal topography measurements (pre-treatment, during follow-up until refractive stability is achieved, and thereafter at the discretion of the practitioner)

**Consent**

Optometrists must obtain informed consent from patients, including information regarding the fitting method, concerns and precautions of overnight contact lens wear, realistic expectations, the pre- and post-fitting appointment obligations, the itemized costs involved, the warranty/exchange of material policies, and what to do in the event of an emergency. If patients are incapable of providing consent (i.e.
young children undergoing Ortho-K for myopia control), consent must be obtained from their substitute decision-makers (usually a parent in the previous example).

**Clinical Guideline**

Optometrists not performing Ortho-K should maintain current, general knowledge of Ortho-K therapy so that they can identify and refer patients who may benefit from this treatment.

When optometrists share the management of patients undergoing Ortho-K therapy, there should be clear and documented communication outlining the expectations regarding the frequency of visits to each optometrist. It is important that patients understand which optometrist is their primary point of contact, and overlap of testing should be minimized whenever possible.

**References:**

Additional references relevant to this topic include:

1. [http://www.myopiaprevention.org/references_orthokeratology.html](http://www.myopiaprevention.org/references_orthokeratology.html)

7.11 Patients With Dry Eye Disease

Description

The tear layer overlying the cornea must create a uniform optical surface, lubricate and nourish tissue, remove metabolic and cellular debris, and provide antimicrobial protection.

Dry eye disease (DED) is much more complex than the name suggests, defined by the International Dry Eye Workshop in 2007 as:

‘a multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance, and tear film instability with potential damage to the ocular surface . . . accompanied by increased osmolarity of the tear film and inflammation of the ocular surface.’

Symptoms may be episodic or chronic. Although DED is broadly categorized as aqueous deficient dry eye (ADDE, secondary to lacrimal gland insufficiency) or evaporative dry eye (EDE, secondary to meibomian gland dysfunction, MGD), these categories are not mutually exclusive; patients typically present with mixed-mechanism disease. The common mechanisms and endpoints of DED, regardless of etiology, are hyperosmolarity, inflammation, and tear film instability.

Optometrists possess the knowledge, skill, and judgment to diagnose and treat DED.

Regulatory Standard

The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation which a consent is required by law, without such a consent.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.
Professional Standard

The DED assessment begins with the case history, where optometrists must pay special attention to risk factors pertaining to patient age, sex, general health and medications, and occupation/avocation(s).

Patients are questioned regarding symptoms suggestive of DED.

Optometrists must perform a clinical examination of the anterior segment of the eye (OPR 6.1). Depending upon signs and symptoms, special attention is given to eyelid anatomy and health, meibomian gland integrity and function, the blink mechanism, and the integrity of the precorneal tear film and cornea itself.

Optometrists recognize that signs and symptoms of DED are often discordant and that no single diagnostic test can be relied upon to the exclusion of others.

Treatment of DED is based upon both the category and severity of presentation, and may necessitate referral (OPR 4.5) to another regulated health professional for further assessment, including medical and/or surgical intervention. Treatment options include but are not limited to:

- recommending modification of the patient’s environment (including but not limited to increasing humidity, reducing air movement, encouraging more frequent breaks from prolonged VDT usage, and considering alternative topical and/or systemic medications);
- encouraging and providing instruction for proper eyelid hygiene;
- treatment of concurrent ocular allergies;
- use of non-prescription lubricating agents (artificial tears) of varying viscosities and/or osmolarities, including consideration of preserved versus non-preserved and the component of the natural tear layer deemed most deficient;
- employing mechanisms to promote retention of natural and artificial tears (including but not limited to the use of bandage soft or scleral contact lenses, punctal occlusion (only when concurrent inflammation is under control), or moisture goggles);
- recommending the use of oral OTC products (including but not limited to essential fatty acid supplements);
- judicious use of topical and/or systemic prescription medications (including but not limited to topical and oral anti-inflammatory and antibiotic (specifically tetracycline) agents) within the parameters established by Ontario Regulation 112/11 – Designated Drugs and Standards of Practice (OPR 4.4).

Clinical Guideline

The use of validated questionnaires may be of assistance to augment but not replace a detailed case history.
Patients may benefit from more advanced diagnostic assessment, including but not limited to:

- quantification of tear osmolarity;
- assessment of tear film thickness and integrity through, among other means, interferometry or anterior segment optical coherence tomography (OCT).

Patients may also benefit from more advanced medical and/or surgical intervention, including but not limited to:

- thermal pulsation treatment for MGD;
- meibomian gland probing;
- lid margin debridement;
- referral for surgical punctal occlusion or tarsorraphy;
- artificial tears formulated from autologous serum (specifically for patients with concurrent autoimmune disease).

Members should consult the National Dry Eye Disease Guidelines for Canadian Optometrists, as developed by The Canadian Dry Eye Disease Consensus Panel for the Canadian Journal of Optometry (Appendix 1).

Additional Documents Relevant to this Topic are:

6. Care of the Patient with Ocular Surface Disorders (CPG10) (www.aoa.org)
7. Care of the Patient with Conjunctivitis (CPG11) (www.aoa.org)
Screening, Diagnosis and Management of Dry Eye Disease:
Practical Guidelines for Canadian Optometrists
7.11 Patients With Dry Eye Disease

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Screening, Diagnosis and Management of Dry Eye Disease: Practical Guidelines for Canadian Optometrists

C. Lisa Prokopich, OD, MSc, Etty Bitton, OD, MSc, FAAO, Barbara Coffery, OD, PhD, FAAO, Langis Michaud, OD, MSc, FAAO, Derek N. Cunningham, OD, FAAO, Paul M. Karpecki, OD, FAAO, Andrew Webber, OD, Paul Neumann, OD, Jean-Sébastien Dufour, OD, MSc, Anthony Cullen, OD, PhD, FAAO, Scott D. Brisbin, OD, FAAO

On the Cover
Meibomian Gland Evaluator (TearScience) used to express the meibomian glands with a consistent force.
Screening, Diagnosis and Management of Dry Eye Disease: Practical Guidelines for Canadian Optometrists

The Canadian Dry Eye Disease Consensus Panel was developed to create a national guide for the clinical management of dry eye disease in an effort to assist Canadian optometrists in the diagnosis and management of one of the most prevalent ocular diseases they will encounter. The panel consists of experts from multiple areas of optometry including private practice, academia and research. Experts were chosen based on their clinical acumen in the field of dry eye disease management, publication frequency, clinical research and recommendations from Canadian colleagues citing their expertise in this area of practice. Due to Canada’s vast geographical area, experts were chosen from different regions of the country. The West Coast, Prairies, Ontario, Quebec, and the Maritimes were all represented. Editorial support was provided by Paul Karpecki, O.D. and Derek Cunningham O.D., both of whom are Canadians who are involved in dry eye/surgical practices in the United States. Unrestricted educational funding was provided by Allergan Inc, Canada.

ABBREVIATIONS:

ALA = alpha-linolenic acid; CL = contact lens; CN7 = seventh cranial nerve/facial nerve; CTT = cotton thread test; DED = dry eye disease; DEQ = Dry Eye Questionnaire; DEQ-5 = 5-item Dry Eye Questionnaire; DHA = docosahexaenoic acid; EFA = essential fatty acid; EPA = eicosapentaenoic acid; FL-TBUT = fluorescein TBUT; GLA = gamma-linolenic acid; GPC = giant papillary conjunctivitis; IDEEL = impact of dry eye on everyday life; IOP = intraocular pressure; KCS = keratoconjunctivitis sicca; LWE = lid wiper epitheliopathy; LG = lissamine green; MG = meibomian gland; MGD = MG dysfunction; MMP = matrix metalloproteinase; NIBUT = non-invasive break-up time; NSAIDs = non-steroidal anti-inflammatory drugs; OCT = optical coherence tomography; OSDI = Ocular Surface Disease Index; PRTT = phenol red thread test; SLE = slit lamp exam; SLK = superior limbic keratoconjunctivitis; SPEED = standard patient evaluation of eye dryness questionnaire; SPK = superficial punctate keratitis; SS = Sjögren syndrome; TBUT = tear break-up time; TMH = tear meniscus height; ULMS = upper lid margin staining
INTRODUCTION

Dry eye Disease (DED) is one of the most common conditions encountered in optometric practice. The reported prevalence of this disease ranges from 7.8 to 29%. These estimates vary depending on the definition of DED used, and the age of the cohort and country where the study was conducted. Regardless of the actual number, the appropriate diagnosis and management of this common disease is critical to meeting the eye care needs of a large segment of the general North American population. However, poor accessibility of eye care services, costs, as well as the restriction of existing treatment modalities to primary care practitioners are some of the reasons contributing to the lack of care in this population. Further, some consider DED to be a symptom rather than a disease and, consequently, fail to realize the importance of diagnosis and treatment to prevent progression to chronic ocular surface disease.

Recent scientific and clinical advances have increased our understanding of this complex group of diseases. The 2007 Dry Eye Workshop (DEWS) report created a comprehensive definition for DED that is the most widely accepted version to date. The authors of the report defined DED as a “multifactorial disease of the tears and ocular surface that results in symptoms of discomfort, visual disturbance and tear film instability with potential damage to the ocular surface. It is accompanied by increased osmolarity of the tear film and inflammation of the ocular surface”. The complexity of DED is suggested by this multidimensional definition, as well as by the density of the document that summarized the body of knowledge. Other groups including the Delphi panel in 2006, and a group of Canadian ophthalmologists in 2008 have created consensus guidelines. A comprehensive review of meibomian gland disease (MGD), a primary cause of evaporative DED, was subsequently published by the Tear Film and Ocular Surface Society in 2011.

DED may be broadly classified as aqueous deficient or evaporative, although at a clinical level these categories often overlap and coexist. The most severe and well-defined form of aqueous deficient DED is Sjögren syndrome (SS), a chronic autoimmune disease that preferentially attacks the lacrimal and salivary glands, as well as many other organ systems (see www.sjogrenscanada.org). The American European Consensus group for the diagnosis of SS includes a measure of aqueous production, non-anesthetized Schirmer, as a criterion for diagnosis. The phenol red thread test (PRTT) can also be used to diagnose aqueous deficiency. The evaporative form of the disease is often observed clinically by the breakup of the tear film, which is most typically measured invasively with the use of fluorescein. Clinicians and patients would benefit from simple classification and disease staging systems.

Symptoms play an important role in the diagnosis of DED and evaluating treatment outcomes. One of the difficulties is that a patient’s experience of the disease may be far more uncomfortable than it appears to a clinician when examining the clinical signs. Four validated questionnaires [Ocular Surface Disease index (OSDI), 5-item Dry Eye Questionnaire (DEQ-5), McMonnies and Standard Patient Evaluation of Eye Dryness (SPEED) questionnaire] have been shown to be useful tools to identify patients with mild symptoms that would otherwise be overlooked when simple questions about dryness are used alone; for example, in those patients who present with symptoms of intermittent blurry vision only.

There is no single objective test that leads to the diagnosis of DED. Clinicians tend to use slit lamp findings such as tear meniscus height, lid observations and corneal staining consistently in their assessments. Many other useful tests are available such as tear film osmolarity and inflammatory markers as well as conjunctival staining, but these are as yet not widely used because of the chair time and expense, and because simple and effective treatment options had not, until recently, been identified. Further, there is inconsistency among signs and symptoms, and the results of various tests for DED may not correlate with each other. This variability among signs and symptoms can lead to confusion about the best course of treatment. For those patients who receive a diagnosis of DED and who initiate treatment, there is little guidance in the published literature to gauge treatment success.
It is with this knowledge that a group of eye care professionals gathered to create a practical clinical approach to DED. The objective of this document is to address some of the challenges associated with practical and effective screening, diagnosis and management strategies for DED in contemporary clinical practice. Further, a simplified clinical approach to categorizing the individual patient’s disease into simple bins, identifying whether the disease is “episodic”, “chronic” or “recalcitrant” is intended to facilitate a straightforward treatment paradigm that can be applied during most patient encounters.

SCREENING FOR DRY EYE DISEASE
Given the high prevalence and variability of symptoms, almost every adult presenting for a primary care examination should be considered to be a DED suspect until proven otherwise. The diagnosis of DED begins with a quick, selective screening. The clinician asks a few targeted questions, identifies risk factors, and conducts a brief screening examination. Patients identified with this process should be considered for a more comprehensive DED workup.

CASE HISTORY
In addition to a conventional case history, the answers to four simple questions serve as an easy and quick indicator of the likelihood of DED (Figure 1).

1. Do your eyes feel uncomfortable?
2. Do you have watery eyes?
3. Does your vision fluctuate, especially in a dry environment?
4. Do you use eye drops?

If yes to any of the above questions:
1. Do you have dry mouth?

An affirmative response to any of these questions should raise the suspicion of DED and prompt a screening examination. In particular, the presence of dry eye along with dry mouth should prompt consideration for referral to another health care professional, such as a rheumatologist, for SS. Remember that ocular symptoms can occur as a result of many conditions, so be sure to rule out the myriad of other conditions that may mimic DED (Table 1).

RISK FACTORS
If the answers to the four screening questions suggest the possibility of DED, the presence of risk factors should be evaluated, even if the symptoms are mild. The most important risk factors associated with DED include: a history of lid, ocular, or refractive surgery; age over 40 years; female gender; use of medications known to cause DED (Table 2); presence of certain systemic diseases (Table 3); smoking; computer vision syndrome; and frequent exposure to harsh environments (dust, dry air, cooling and heating units, airplanes).

Table 1. Conditions that may mimic dry eye disease.

<table>
<thead>
<tr>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allergic ocular diseases</td>
</tr>
<tr>
<td>Anterior basement membrane dystrophy</td>
</tr>
<tr>
<td>Binocular vision problems</td>
</tr>
<tr>
<td>Computer vision syndrome</td>
</tr>
<tr>
<td>Conjunctivochalasis</td>
</tr>
<tr>
<td>Contact lens/solutions induced problems</td>
</tr>
<tr>
<td>Giant papillary conjunctivitis</td>
</tr>
<tr>
<td>Infectious blepharitis</td>
</tr>
<tr>
<td>Lid issues (entropion, ectropion, lagophthalmos, floppy eyelid syndrome)</td>
</tr>
<tr>
<td>Ocular pemphigoid</td>
</tr>
<tr>
<td>Pingeueculitis</td>
</tr>
<tr>
<td>Salzmann nodular degeneration</td>
</tr>
<tr>
<td>Superior limbic keratoconjunctivitis</td>
</tr>
<tr>
<td>Visual system misalignment</td>
</tr>
</tbody>
</table>
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Table 2. Medications with the potential to induce or exacerbate dry eye disease

<table>
<thead>
<tr>
<th>Drug class</th>
<th>Examples</th>
<th>Trade Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antiarrhythmic drugs</td>
<td>Disopyramide</td>
<td>Norpace® and Rythmodan®</td>
</tr>
<tr>
<td></td>
<td>Quinidine</td>
<td>BIQuin®</td>
</tr>
<tr>
<td>Antihistamines</td>
<td>Diphenhydramine</td>
<td>Benadryl®</td>
</tr>
<tr>
<td></td>
<td>Hydroxyzine</td>
<td>Vistaril®, Atarax®</td>
</tr>
<tr>
<td></td>
<td>Fexofenadine</td>
<td>Allegra®</td>
</tr>
<tr>
<td></td>
<td>Loratadine</td>
<td>Claritin®</td>
</tr>
<tr>
<td>Anti-Parkinson</td>
<td>Benztropine</td>
<td>Cogentin®</td>
</tr>
<tr>
<td></td>
<td>Trihexyphenidyl</td>
<td>Artane®</td>
</tr>
<tr>
<td>Antipsychotics</td>
<td>Chlorpromazine</td>
<td>Thorazine®, Largactil®</td>
</tr>
<tr>
<td></td>
<td>Haloperidol</td>
<td>Haldol®</td>
</tr>
<tr>
<td>Antispasmodics</td>
<td>Hyoscine butylbromide</td>
<td>Buscopan®</td>
</tr>
<tr>
<td></td>
<td>Oxybutinutin</td>
<td>Ditropan®, Lyrinel® XL, Lenditro®</td>
</tr>
<tr>
<td></td>
<td>Tolteridine</td>
<td>Detrol®, Detrusitol®</td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>Amitriptyline</td>
<td>Elavil®</td>
</tr>
<tr>
<td></td>
<td>Nortriptyline</td>
<td>Aventyl®, Pamelor®, Norpress®, Allegron®, Noritren®, Nortrilen®</td>
</tr>
<tr>
<td>Diuretics</td>
<td>Hydrochlorothiazide</td>
<td>Hydrodiuril®</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>Atenolol</td>
<td>Tenormin®</td>
</tr>
<tr>
<td></td>
<td>Metoprolol</td>
<td>Lopressor®</td>
</tr>
<tr>
<td>Retinoids</td>
<td>Isotretinoin</td>
<td>Accutane®</td>
</tr>
<tr>
<td>Hormone replacement therapy</td>
<td>Estrogen supplements</td>
<td></td>
</tr>
<tr>
<td>Selective serotonin reuptake inhibitors</td>
<td>Fluoxetine</td>
<td>Prozac®</td>
</tr>
<tr>
<td></td>
<td>Fluvoxamine</td>
<td>Luvox®</td>
</tr>
<tr>
<td></td>
<td>Paroxetine</td>
<td>Paxil®</td>
</tr>
<tr>
<td></td>
<td>Sertraline</td>
<td>Zoloft®</td>
</tr>
<tr>
<td>Systemic chemotherapy</td>
<td>Cyclophosphamide</td>
<td>Cytosax®, Procyst®</td>
</tr>
<tr>
<td></td>
<td>5-fluorouracil</td>
<td>5-fluorouracil, 5-FU</td>
</tr>
</tbody>
</table>

Table 3. Systemic diseases associated with dry eye disease

<table>
<thead>
<tr>
<th>Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Androgen deficiency</td>
</tr>
<tr>
<td>Chronic hepatitis C</td>
</tr>
<tr>
<td>Diabetes insipidus</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Hematopoietic stem cell transplantation</td>
</tr>
<tr>
<td>Pemphigoid</td>
</tr>
<tr>
<td>Primary biliary cirrhosis</td>
</tr>
<tr>
<td>Psoriasis</td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
</tr>
<tr>
<td>Rosacea</td>
</tr>
<tr>
<td>Scleroderma</td>
</tr>
<tr>
<td>Sjogren syndrome</td>
</tr>
<tr>
<td>Stevens-Johnson Syndrome</td>
</tr>
<tr>
<td>Systemic lupus erythematosus</td>
</tr>
<tr>
<td>Thyroid disease</td>
</tr>
<tr>
<td>Vitamin A deficiency</td>
</tr>
</tbody>
</table>

**SCREENING EXAMINATION**

The preliminary screening examination becomes necessary when a patient responds positively to any of the first four screening questions (see Figure 1), especially in the presence of known risk factors for DED. The screening examination is simple and is intended to be part of a regular ocular health assessment. It is based on a 3-step approach:

1. **Evaluate facial symmetry, eyelids, lashes, blink, and lid closure**

   The practitioner should begin by looking for irregularities, crusting, redness, and other evidence of lid disease. Observe blink rate and completeness of blink, especially in patients who use computers or hand-held devices extensively.

   When evaluating the lids consider the role of rosacea as many patients with this condition
have ocular manifestations.\textsuperscript{(21-24)} The nose, cheeks, forehead, and chin are the most commonly affected areas. Ocular rosacea is associated with blepharitis, conjunctivitis, inflammation of the lids and meibomian glands (MG), interpalpebral conjunctival hyperemia and conjunctival telangiectasia. It is important to note that ocular signs may precede dermatological manifestations of rosacea by years; however, in the majority of cases, they develop concurrently.\textsuperscript{(22)}

Four types of rosacea are recognized by the National Rosacea Society, of which two are common. Papulopustular rosacea primarily affects women in middle age (aged 30-40 years) who complain of episodic eye dryness and discomfort induced by contact lenses (CLD). These patients often have a history of flushing when exposed to triggers. External examination reveals small erythematous papules covered with pinpoint pustules. Phymatous rosacea primarily affects older men (aged >55 years) who present with thick lids, pustules, and rhinophyma.

2. Evaluate tear film: TBUT-using fluorescein strips

Instill fluid from a fluorescein strip wetted with saline onto the lower lid tarsal conjunctiva and have the patient blink normally. Do not use a fluorescein/anesthetic combination because anesthetic drops initiate reflex tearing and promote conjunctival hyperemia. Thus, evaluation of TBUT with a combination product is less valid. Observe the ocular surface with a biomicroscope and cobalt blue filter. Have the patient blink once and hold their eyes open either for as long as possible, or until until a black area is observed, indicating the break-up of the tears. Generally, a finding of < 10 seconds raises suspicion for DED.
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### Table 4. Criteria for Sjögren Syndrome (SS)

<table>
<thead>
<tr>
<th>Group</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>American-European Consensus Group, 2002&lt;sup&gt;(14)&lt;/sup&gt;</td>
<td>Primary SS: requires 4 of the 6 criteria, as long as either item 4 (histopathology) or 6 (serology) is positive. Secondary SS: presence of connective-tissue disease, symptoms of oral or ocular dryness, in addition of 2 of the criteria #3, #4 or #5. 1. Ocular symptoms &gt; 3 months 2. Oral symptoms (dry mouth, swollen salivary glands or frequent use of liquids to swallow dry food) 3. Ocular signs Schirmer’s test without anesthesia (&lt;5 mm/5 min) Positive vital dye staining 4. Oral signs (histopathology): Abnormal salivary scintigraphy findings Abnormal parotid sialography findings Abnormal sialometry findings 5. Positive minor salivary gland biopsy findings 6. Positive anti-SSa or anti-SSB antibody test results</td>
</tr>
<tr>
<td>Sjögren's International Collaborative Clinical Alliance (SiCCA) adopted by the American College of Rheumatology, 2009&lt;sup&gt;(26)&lt;/sup&gt;</td>
<td>At least 2 of the 3 following findings need to be met: 1. Positive serum anti-SSa and/or anti-SSB antibodies or positive rheumatoid factor and antinuclear antibody (ANA) titer of at least 1:320 2. Ocular staining score of at least 3. 3. Presence of focal lymphocytic sialadenitis with a focus score of at least 1 focus/4 mm² in labial gland biopsy samples</td>
</tr>
</tbody>
</table>

3. **Fluorescein corneal staining**

After evaluating the TBUT, use the cobalt filter to observe corneal staining. Evaluate the location, pattern and severity of staining. Corneal staining associated with DED is typically evident in the lower part of the cornea, and tends to be confluent.

In summary, the presence of symptoms as revealed by the screening questions, combined with one or more signs on the screening evaluation, should prompt the clinician to proceed to a more comprehensive DED workup, either on the same or different day.

**DIAGNOSIS: THE COMPLETE DRY EYE DISEASE WORKUP**

Optometrists normally attempt to address all of a patient’s concerns in a single primary care examination. However, the evaluation of patients with DED requires specific testing and more than an additional 5 or 10 minutes tacked on to a routine examination. Once a patient has been identified as being a DED suspect through screening, a full DED workup is recommended. This model is similar to that used by most optometrists to evaluate patients at risk for glaucoma. These patients typically return for a glaucoma workup, at which time further tests (i.e., tonometry, optic nerve head evaluation, visual field testing, pachymetry, imaging and gonioscopy) are performed. Similarly a targeted workup is required to adequately address DED.<sup>(25)</sup>

The tests described in this section comprise the comprehensive DED workup and assist the practitioner in evaluating contributing factors, such as aqueous deficiency, evaporative causes, CL wear, solution toxicity, and others. The workup should include a detailed case history including a full list of medications, with close attention to those that may contribute to ocular dryness (Table 2). Careful attention to the order of testing is important to ensure that the outcome of the overall workup is not affected. As the clinician navigates through the tests, a differential diagnosis should emerge leading to an evaporative or aqueous deficient etiology, while keeping in mind that both types may coexist. The frequency of symptoms (episodic versus chronic) guides the management of the patient.

The presence of prolonged symptoms, dry mouth, low tear flow, and ocular staining prompts the clinician to consider the presence of SS. Further questioning around related symptoms is
helpful, including but not limited to, the presence of neuropathy, gastrointestinal symptoms, Raynaud syndrome and others (for more information please visit www.sjogrenscanada.org).

There are two prevailing diagnostic schemes for SS, namely, the American-European Consensus Group (14) and the Sjögren’s International Collaborative Clinical Alliance (SiCCA) adopted by the American College of Rheumatology (2002) (Table 4). (26) If SS is suspected, referral to a rheumatologist should be initiated highlighting the findings and contributory history. A solid co-management arrangement generally facilitates the most appropriate ongoing care for the patient.

Keep three key questions in mind when evaluating a patient with DED:

1. What is the frequency (episodic or chronic) and severity of symptoms and how do they affect the patient’s activities (reading, driving, watching TV, etc.)?
2. What portion of the ocular dysfunction is likely attributable to evaporative causes (evaluate MG) or aqueous deficiency (evaluate quantity/volume)?
3. Is the integrity of the ocular surface compromised?

With these questions in mind, the practitioner proceeds to testing. As sequencing can affect the outcome, a specific order of testing is recommended (Table 5).

**EVALUATION OF SYMPTOMS**

DED is largely a symptomatic disease. (27, 28) As such, clinicians need validated tools to evaluate symptoms and appreciate how the daily lives of patients are affected. It is important to start the DED work-up with an assessment of symptoms, prior to instilling any drops or manipulating the eyes, in order to minimize the effect on the results.

**Table 5. Suggested order of dry eye disease work-up**

1. Case history with dry eye questionnaire
2. Osmolarity (if available)
3. Tear quantity and volume
   - Schirmer 1 (no anesthesia) or Phenol red thread test (PRTT)/Cotton thread test (CTT)
4. Anterior segment evaluation with white light (focus on the lid margin)
5. Tear break-up time (TBUT)
6. Ocular surface integrity (using ophthalmic dyes and appropriate filters)
   - Cornea
   - Conjunctiva
7. Meibomian gland (MG) expression and assessment
8. Adjunctive tests *

*order of testing may vary as a result

**Figure 2. Ocular Surface Disease Index (OSDI) severity scale.**
The Ocular Surface Disease Index (OSDI)\(^\text{29}\) is a self-administered 12-question assessment of symptoms and how they affect vision-related tasks (i.e. reading, driving, computer use, etc.).\(^\text{37}\) The questionnaire is divided into three sections: the first evaluates the frequency of symptoms; the second evaluates the effect of symptoms on daily tasks; and the third evaluates the effect of environmental factors, such as windy conditions and air conditioning. The scores on the three sections are summed to arrive at a final OSDI score, which ranges from 0 to 100, with higher values indicating greater symptom severity [normal (<12), mild (13-22) moderate (23-32) or severe (33-100), Figure 2]. The OSDI has a high degree of sensitivity (80%) and specificity (79%) for discriminating patients with and without DED, and is even better at identifying patients with severe disease (sensitivity 87%; specificity 96%).\(^\text{17}\)

The OSDI is available in English and French, although only the English version has been validated. The French version has been professionally translated but not validated.\(^\text{29}\)

The validated McMonnies questionnaire can be integrated into practice easily.\(^\text{39, 30-32}\) Responses to questions about gender, age, medication use, general health and contact lens (CL) wear increase the suspicion for dryness and prompt the practitioner to perform further tests. Each response is assigned a numeric value and the sum is then compared to a risk table. The higher the total score, the greater the risk of dryness. The cut-off point for DED is 14.5 out of a possible 45.\(^\text{33, 34}\) The questionnaire has a high sensitivity (98%) and specificity (97%) for DED, but is not as sensitive in categorizing marginal DED.

The DEQ-5 is a user-friendly questionnaire that is quick and easy to complete.\(^\text{18}\) The patient rates the frequency (never, rarely, sometimes, frequent, and constant) with which they have experienced three symptoms (watery eyes, discomfort and dryness) in a typical month. The patient is also asked to rate the increase in intensity of discomfort and dryness throughout the day. Each response corresponds to a numeric value that is used to calculate a final DEQ-5 score. A DEQ-5 score >6 is indicative of DED and a score >12 is indicative of SS.

The SPEED questionnaire involves a series of four key DED symptoms that are rated on frequency and severity combined with 3 additional questions on artificial tear use, blepharitis and frequency of fluctuating vision.\(^\text{20}\) The SPEED score is the sum of the Symptom and Frequency Scores, which range from 0 and 32. No cut-off value for DED has been adopted to date.\(^\text{20}\)

Although several other validated DED questionnaires are available, some (DEQ, Impact of Dry Eye on Everyday Life (IDEEL)) are more suitable for research and will not be discussed here.\(^\text{35, 36}\)

**TEAR OSMOLARITY**

Tear osmolarity analysis is a point-of-care test that provides immediate results. A small sample of tears is obtained at the temporal edge of the tear meniscus with a TearLab pen. Once a 50 nl sample is obtained, the device beeps and a light indicates that the collection is complete. The pen is then placed into the reader and within 10 seconds the analysis is complete and the result is displayed in mOsmol/L.

Tear film osmolarity is the most accurate single test for DED,\(^\text{8, 9}\) but should not be used in isolation for the diagnosis of DED. Generally readings higher than 308 mOsmol/L are considered diagnostic of DED. Higher values and a variance of >8 mOsmol/L between eyes indicate more severe disease.\(^\text{8, 9}\)

**EVALUATION OF TEAR FLOW**

DEWS categorized DED as being primarily aqueous deficient or evaporative in origin.\(^\text{10}\) Although the latter is more common, tear flow must be quantified to distinguish between these two categories. Measuring tear flow can assist in the initial diagnosis of DED and can be used to determine and monitor treatment options. Two readily available tests, the Schirmer test and the PRTT/CTT are useful in this regard.
The Schirmer test has a reputation for causing discomfort, but is a sensitive test for detecting tear deficiency, particularly when SS is suspected. When performed without anesthesia (Schirmer 1), the test measures the quantity of residual tears accumulating in the lower cul-de-sac during a 5 minute period. A value >10 mm/5 min is considered to be normal. Lower values indicate increasing degrees of tear deficiency. Care must be taken to avoid stimulating reflex tearing, which renders the result inconclusive for most cases of DED. The test is more robust in tear-deficient DED, in which the patient is incapable of producing adequate tears. The sensitivity (85%) and specificity (83%) of the Schirmer test are relatively high for differentiating between normal individuals and those with tear deficiency.

The PRTT is a fast and more comfortable alternative test for assessing tear volume. It is performed by inserting a phenol red-impregnated cotton thread in the lower fornix of the lid for 15 seconds. The change in colour of the wetted thread is easy to observe and measure directly with the scale on the package. A value >9 mm/15 sec is considered to be normal. The sensitivity (86%) and specificity (83%) are comparable to that of the Schirmer test (see above). As with any measure of tear quantity, the clinician needs to be aware of high readings as these may be suggestive of reflex tearing.

There are more sophisticated ways of quantifying the lower tear meniscus height (TMH) as an indirect measure of tear volume (e.g., anterior optical coherence tomography (OCT) or corneal topography). Although these tests are generally not available to most clinicians, they are gaining acceptance.
7.11 Patients With Dry Eye Disease

**ANTERIOR SEGMENT EVALUATION**

A systematic assessment of the lashes, lid margin, cornea, and bulbar and palpebral conjunctiva is needed to assess the proper functioning of the tear film and ocular surface.

Particular attention is given to the lid margin where evidence of blepharitis (anterior or posterior), lash loss (madarosis), thickening of the lid margin (tylosis), lid inapposition, notching of the lid margin, posterior migration of gland orifices, and dilation of small blood vessels along the lid margin (telangiectasia) can be observed. Debris accumulated on the lashes, whether from make-up, environmental contaminants or from anterior blepharitis, can fall onto the tear film, increasing the viscosity and slowing the movement of the tear film towards the punctum.

**EVALUATION OF MEIBOMIAN GLANDS**

Expressing the MG and evaluating the composition of their secretions is important. Assessing the MG can provide insight into the factors contributing to evaporative DED. The appearance and consistency of meibum expressed by the Mastrota paddle, the Meibomian Gland Evaluator or simply by a finger or cotton swab, can be described in terms that correspond to increasing levels of MGD (clear, cloudy, cloudy with debris, thick or paste-like, or non-expressive). Saponification, or the appearance of bubbles similar to a soap foam (frothing) along the lid margin, can indicate hypersecretion of the MG. The foam often accumulates in the temporal canthus and is easily observed using a slit lamp.

Tools such as the Mastrota paddle and the Meibomian Gland Evaluator have been developed to assist in MG expression, although using the thumb to press on the lid or a wet cotton swab behind the eyelid are effective alternatives.

The Mastrota paddle (available from Ocusoft) is a 7 cm titanium instrument with rounded edges that is placed behind the lower lid to assist in the expression of the MG (Figure 4). Using a finger or thumb, gentle pressure is applied to the lower central to nasal lid to express the MG against the surface of the paddle.

The Meibomian Gland Evaluator looks like a USB key (Figure 5). The white tip is pressed tangentially against the central lower lid to exert pressure equivalent to that of a normal blink (i.e., between 0.8 and 1.2 g/mm²) and then is retracted into the blue housing.

**EVALUATION OF OCULAR SURFACE INTEGRITY**

The evaluation of the integrity of the ocular surface, cornea and conjunctiva is an essential part of the DED workup. Fluorescein is best suited for assessing the cornea, while lissamine green (LG) is preferred for the conjunctiva. The use of both ophthalmic dyes is optimal to ensure adequate evaluation of ocular surface integrity. LG has a robust safety profile and is better tolerated than rose bengal, which stings on instillation; however, obtaining LG is a challenge in Canada and the U.S.
Staining of the cornea and conjunctiva indicates that the integrity of the tissue has been compromised and that inflammatory mediators are present. Many factors can cause corneal staining including prolonged surface exposure due to infrequent or incomplete blinking, toxic effects of preservatives in eye drops, CL wear and exposure to CL care solutions, and lid margin inflammation caused by blepharitis. A thorough case history that includes systemic and ocular medication use, and the type of CL and cleaning solutions used, will tease out some of the factors responsible for the breakdown in ocular surface integrity. Whatever the cause, or the ophthalmic dye used, proper documentation of staining should include the pattern, position, depth and the grade (identifying the scale that is used).

Overall, corneal staining in non-CL wearers occurs more frequently in the inferior quadrant, with the central cornea being affected least. When adding fluorescein it is important to control the instilled volume. If the strip delivers too much dye, quenching can occur and it may be difficult to see any pattern until the excess is cleared from the eye. Controlling the volume (by shaking off the excess prior to instillation) and having the patient blink several times to distribute the fluorescein should optimize the assessment. Adding a yellow barrier filter enhances subtle staining and is essential to use to assess conjunctival fluorescein staining (Figure 6). Most new biomicroscopes have an integrated barrier filter. Otherwise, a hand held filter may be used.

Identifying the pattern and location of staining provides clues to the cause of the symptoms. Staining may occur as scattered superficial dots (punctate staining), or coalesce to form patchy or confluent areas. These patterns may be located in any quadrant of the cornea (superior, inferior, temporal or nasal) or may even be interpalpebral. Staining in the superior quadrant is indicative of superior limbic keratoconjunctivitis (SLK), a condition found mostly in women aged 20-60 that is believed to be related to a tight lid/globe interface or thyroid disease. Diffuse punctate staining across the cornea may be indicative of toxicity. Reviewing the preservatives in eye drops or CL care solutions may reveal the cause of the observed fluorescein hyperfluorescence, which

**Figure 6.** Conjunctival tissue observed under cobalt blue illumination (left) and enhanced with a yellow barrier filter (right).
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is known as solution-induced corneal staining (SICS) and should not be confused with diffuse superficial punctate keratitis (SPK) (Figure 7). SICS is not considered to be true staining but, rather, is associated with increased permeability of epithelial cell membranes after exposure to preservatives. It is not associated with a higher infection rate. The presence of the transitory SICS in soft CL wearers should prompt the clinician to review the compatibility of the CL and the solutions.\(^\text{67}\) It is highly recommended to consider a refit into daily disposables at that time.

Corneal staining near the lid margin (superior or inferior) points to blepharitis. Careful assessment of the lashes and lid margins is essential to determine the source of this staining pattern. Staining between the lid margins (interpalpebral) points to an incomplete or ineffective blink, or to nocturnal lagophthalmos, conditions that leave the cornea exposed to dehydration. Sectoral staining may be caused by a foreign body or a localized irritant, such as GPC, concretions, a loose lash or debris.

Conjunctival bulbar staining also provides insight into the etiology of DED. Both fluorescein and LG can be used to assess the conjunctiva, although LG is more sensitive, especially for symptomatic CL wearers.\(^\text{59}\) Staining occurs more frequently on the nasal conjunctiva in patients with DED, whereas temporal staining is more indicative of SS.\(^\text{74}\) These new clinical findings reinforce the use of ophthalmic dyes in a comprehensive DED workup in assessing the integrity of both the cornea and conjunctiva.

Some practitioners advocate simultaneous double staining of the ocular surface with both fluorescein and LG as a way to save chair time. Double staining correlates well with symptoms and tear film stability in patients with DED. Typically, the nasal conjunctiva stains to a greater extent than the temporal conjunctiva, with the cornea being affected less. To date, there are no commercially available combination dyes in Canada.

The clinician’s attention should also be directed to the inner lid margin, above the Marx line, to an area called the “lid wiper”. The lid wiper is that part of the inner upper palpebral conjunctiva that is in contact with the cornea during a blink.\(^\text{76}\) This area stains with both fluorescein and LG, and lid wiper epitheliopathy (LWE), or upper lid margin staining (ULMS), as it is also termed,\(^\text{77}\) may be present in symptomatic patients, more often in CL wearers,\(^\text{78}\) despite a normal BUT (Figure 8). The presence and intensity of the LWE may be related to decreased mucin production, more specifically mucin-5AC, in symptomatic CL wearers.\(^\text{77, 80}\)

To view LWE, the upper lid is everted to expose the area under the opening of the MG. It has been suggested that instilling dye from two strips of LG 1 minute apart then waiting for at least 3 minutes optimizes the viewing of LWE.\(^\text{81}\) LWE can be graded, and its progress monitored, by measuring the thickness and length (in mm) of the stained area.

**EVALUATION OF TEAR FILM STABILITY**

Once fluorescein has been instilled to evaluate tissue integrity, the stability of the tear film can also be assessed. The tear break-up time (TBUT), probably the most familiar test for this
7.11 Patients With Dry Eye Disease

Purpose, is defined as the time (in seconds) needed for the first break or rupture in the tear film after a blink. Despite its long history of use, the results are often highly variable and many practitioners have lost confidence in the test. However, the variability can be reduced by adhering to a standardized method, which includes wetting the fluorescein strip with sterile saline, controlling the volume instilled (by shaking off excess), tapping the lower tarsal conjunctival surface (as opposed to bulbar) and delivering only a small volume. The clinical value of the TBUT can be further improved by calculating the average of two consecutive measurements.

A TBUT of more than 10 seconds is indicative of a stable tear film. In contrast, patients with DED tend to have a rapid TBUT, typically <5 seconds. Ethnic differences exist, mainly due to differing lid morphologies, such as those in Asian patients, in whom the TBUT is often shorter.

Fluorescein can reduce tear film stability, and less invasive methods are available for the measurement of TBUT. The non-invasive break-up time (NIBUT) can be measured by using the reflected mires of a corneal topographer or other instrument. These methods generally yield longer break-up times.

Normal values expected in a comprehensive DED workup are summarized in Table 6. Additional tests can be performed, depending on the case, the availability of equipment and the expected clinical value. A description of adjunctive tests and some emerging technologies is provided in the Supplementary Appendix.

Table 6. Normal values for dry eye disease testing

<table>
<thead>
<tr>
<th>Evaluation</th>
<th>Test</th>
<th>Normal values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symptom questionnaire</td>
<td>OSDI</td>
<td>&lt;12 /100</td>
</tr>
<tr>
<td></td>
<td>McMonnies</td>
<td>&lt;14.5/45</td>
</tr>
<tr>
<td></td>
<td>DEQ-5</td>
<td>&lt;6 for dry eye</td>
</tr>
<tr>
<td>Tear volume</td>
<td>Schirmer</td>
<td>&gt;10 mm/5 min</td>
</tr>
<tr>
<td></td>
<td>PRTT</td>
<td>&gt;9 mm/15 sec</td>
</tr>
<tr>
<td>Tear osmolarity</td>
<td>TearLab Osmometer</td>
<td>&lt;308 mOsm/L</td>
</tr>
<tr>
<td>Anterior segment evaluation</td>
<td>Slit Lamp examination</td>
<td></td>
</tr>
<tr>
<td>Tear film</td>
<td>Viscosity</td>
<td>Medium-fast</td>
</tr>
<tr>
<td></td>
<td>Debris</td>
<td>Little to none</td>
</tr>
<tr>
<td>Lashes</td>
<td>Lashes</td>
<td>No debris, collarettes or dandruff cuff</td>
</tr>
<tr>
<td>Meibomian glands</td>
<td>Expression</td>
<td>Easy</td>
</tr>
<tr>
<td></td>
<td>Secretions</td>
<td>Clear, liquid</td>
</tr>
<tr>
<td>Lid margin</td>
<td>Lid margin</td>
<td>Good apposition, smooth</td>
</tr>
<tr>
<td>Tear film stability</td>
<td>FL-TBUT</td>
<td>&gt;10 sec</td>
</tr>
<tr>
<td></td>
<td>NIBUT</td>
<td>&gt; FL-TBUT</td>
</tr>
<tr>
<td>Tissue integrity (using ophthalmic dyes)</td>
<td>Cornea</td>
<td>No staining to trace staining (&lt;grade 2)</td>
</tr>
<tr>
<td></td>
<td>Conjunctiva</td>
<td></td>
</tr>
</tbody>
</table>
Figure 9 summarizes the recommendations in this section to help guide the clinician in the management of dry eye disease patients.

**Figure 9. Summary of Full DED workup.**

*GENERAL PRINCIPLES OF MANAGEMENT: OVERVIEW AND CLASSIFICATION*

A practical, clinician-friendly approach is proposed whereby patients with DED are categorized as having “episodic” or “chronic” disease at their initial visit. A third category, “recalcitrant”, is reserved for patients who do not respond sufficiently to the available battery of treatment options and, therefore, require more intensive therapies including systemic medications or surgery. *(Table 7)*

The overarching principle in the management of patients with DED is to reduce symptoms and return the tear film and the ocular surface to as close as possible to a normal state of health. While this may be achieved in patients with episodic or mild disease, it is more challenging in patients with chronic DED, in whom moderate or severe symptoms and signs are more common.

**Episodic** disease occurs when symptoms and signs are not consistently noted; that is, they are present only under certain environmental conditions or during specific visual tasks. Patients with episodic disease may report varying levels of symptom severity, but experience symptoms only when situations such as reduced blinking, CL wear or environmental conditions overwhelm the stability of the tear film or homeostasis of the ocular surface. Episodic disease may result from tear flow deficiencies and/or tear evaporation, but in either case the effects are transient.

DED that is not episodic must be, by definition, **chronic** in nature. The unifying mechanism
in chronic DED is presumed to be consistent inflammation. Chronic DED is also influenced by environmental conditions, and symptoms and signs continue to vary in severity. While the recommended therapies for episodic disease are used concurrently, the focus in chronic DED is on controlling the inflammatory mediators to reduce symptoms and signs, and to minimize disease progression.

**Recalcitrant** DED applies to those patients in whom primary interventions have proved to be insufficient and in whom additional and/or uncommon (“rescue”) strategies may be required. This may occur when, despite maximal application of conventional therapies, a patient remains symptomatic, or the effects to vision and/or tissue damage on the ocular surface progresses to the point where the risk of more serious sequelae is significant. These uncommon interventions may include unique devices (e.g. scleral lenses, amniotic membranes), specialized medications (e.g. autologous serum eye drops, secretagogues), or surgery (e.g. tarsorrhaphy), that are not normally available to the primary eye care practitioner.

**TREATMENT FOR EPISODIC DISEASE**

The management strategies for episodic DED target the presenting symptoms, and attempt to control the exacerbating external conditions. The history and diagnostic workup will often reveal early stages of disease, and management is focused on removing or limiting the environmental cause. The practitioner is advised to use the most appropriate treatment, and to educate each patient not only about the treatment, but also about the rationale for its application.

**MANAGEMENT OF DRY EYE DISEASE**

Table 7. A novel clinical classification and management strategies in DED

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPISODIC</td>
<td></td>
</tr>
<tr>
<td>Tear supplements / lubricants</td>
<td>Consider composition of available agents (lipid-based, products that restore the mucin layer, overall)</td>
</tr>
<tr>
<td>Ocular</td>
<td>Hot compresses, lid hygiene, moisture chamber glasses, modifications to CL wear (switch to daily disposables)</td>
</tr>
<tr>
<td>Non-ocular considerations</td>
<td>Environmental (ambient humidity, air movement, computer use), systemic medications and supplements, alcohol, smoking, hormonal status, sleep apnea</td>
</tr>
<tr>
<td>CHRONIC</td>
<td></td>
</tr>
<tr>
<td>Short-term</td>
<td><strong>Episodic management</strong> +</td>
</tr>
<tr>
<td></td>
<td>Topical corticosteroid</td>
</tr>
<tr>
<td>Long-term</td>
<td>Topical cyclosporine</td>
</tr>
<tr>
<td></td>
<td>Essential fatty acids</td>
</tr>
<tr>
<td>Supportive</td>
<td>Oral tetracycline / macrolide, lacrimal occlusion, meibomian gland (MG) expression (in-office), sleep masks/ lid taping</td>
</tr>
<tr>
<td>RECALCITRANT</td>
<td></td>
</tr>
<tr>
<td>Ocular</td>
<td>Scleral lenses, filament removal, autologous serum eye drops, amniotic membranes, tarsorrhaphy, other surgical techniques</td>
</tr>
<tr>
<td>Systemic</td>
<td>Secretagogue, systemic immunosuppressive therapies</td>
</tr>
</tbody>
</table>

**TEAR SUPPLEMENTATION**

Tear supplements or lubricants are the mainstay of treatment across the full spectrum of DED. There is evidence to show that the use of tear supplements is beneficial to the ocular surface. For example, ocular surface staining with rose bengal improves by 25-33% within one month of using tears, gels or hyaluronate-based supplements. There are many different active ingredients and formulations of tear supplements, the most relevant of which are described in Table 8. Evidence and clinical wisdom will guide the clinician as to the product and frequency of use to recommend for a given patient. However, the use of ocular lubricants more than 4 times a day should prompt the clinician to recommend a non-preserved product to reduce the
risk of toxic adverse effects on the ocular surface. Preservative-free products should also be favored in the presence of other ocular topical medications.

Tear supplements lubricate, can promote ocular surface cell health and may alter the inflammatory state of the ocular surface. They do so indirectly by affecting the tear film osmolarity and, possibly, by decreasing the concentration of inflammatory mediators in the tear film, but do not specifically target the underlying inflammatory disease associated with chronic DED. Because of this, tear supplements are valuable adjunctive therapies when using anti-inflammatory therapies to treat DED. Properties of tear supplements that are important for relieving symptoms and promoting ocular surface healing include: osmolarity, the presence of and type of preservative, inclusion of polymers to increase retention time, and lipid composition (Table 8).[90-92]

### Table 8. Considerations when selecting a tear supplement for a patient with dry eye disease

<table>
<thead>
<tr>
<th>Property</th>
<th>Consideration for Tear Supplements</th>
<th>Recommended examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osmolarity</td>
<td>Should ideally shift tear osmolarity from a hyperosmolar to an isotonic state over time</td>
<td>Blink®, HYLO®, Hypotears®, Refresh Optive Advanced®, Theratears*</td>
</tr>
<tr>
<td>Preservatives (multidose formulations)</td>
<td>If preserved products are to be used, avoid benzalkonium chloride (BAK) and choose those that contain Polyquad, Purite or sodium perborate</td>
<td>Genteal®, Refresh® (Purite) Tears Naturale II® (Polyquad), Theratears® (sodium perborate)</td>
</tr>
<tr>
<td>Preservative-free (most are unit-dose)</td>
<td>Preservative-free products are preferred, especially as frequency of use increases or in the presence of other topical medications</td>
<td>Bion Tears®, HYLO, HYLO-gel® I-Drop®, I-Drop® PM, I-Drop® Pur Gel®, Refresh Celluvisc®, Refresh Endura®, Refresh Optive Advanced® Sensitive, Refresh Plus®, Systane® Ultra PF, Tears Natural Free®, Theratears® PF</td>
</tr>
<tr>
<td>Polymers and viscosity</td>
<td>Enhance hydration of the mucin-gel of the tear film and increase retention time of tear supplements Consider use of low viscosity products (drops, gels) during the day and more viscous products (ointments) during the night</td>
<td>Carboxymethylcellulose, sodium hyaluronate, hydroxypropyl guar-borate</td>
</tr>
<tr>
<td>Lipid Content</td>
<td>Oil-based emulsions restore the inadequate lipid layer in patients with MGD and DED</td>
<td>Liposic®, Refresh Endura®, Refresh Optive Advanced®, Refresh Ultra®, Systane® Balance</td>
</tr>
<tr>
<td>Sodium hyaluronate-containing products</td>
<td>For LWE issues</td>
<td>Blink®, Hyabak®, HYLO®, I-Drop*</td>
</tr>
</tbody>
</table>

### OCULAR CONSIDERATIONS

A number of simple measures can be recommended to relieve the symptoms and signs of DED. These include hot compresses, lid hygiene (when indicated), moisture chamber spectacles and modification of existing CL wear.

### Hot Compresses

Hot compresses are a mainstay of the management of DED associated with MGD. The melting point of the lipid secretions of patients with MGD is elevated compared to those of patients without MGD (from 32 to 35 °C). Tear film lipid layer thickness increased by more than 80% in patients with obstructive MGD after application of a 40 °C compress for at least 4 minutes, and improved by a further 20% after 15 minutes of treatment. Hot compresses are often recommended and may improve secretion from accessory tear glands, their method of use is not standardized. Usually, it is recommended that hot compresses be used on a daily basis for a few weeks or months then, to establish a maintenance regimen, 2 to 3 times a week, depending on the degree of improvement in the condition. Unfortunately, effective use of hot compresses is time intensive and patients find it difficult to maintain a consistent daily regimen.
with traditional methods such as a face cloth. Alternate products such as MGDRx EyeBag, Bausch & Lomb Thera Pearl®, Thermoloeses goggles and the Bruder Eye Hydrating Compress are effective devices that help patients adhere to a regimen. Lipiflow® is an expensive in-office treatment that can be recommended for recalcitrant or non-compliant patients, but also as a primary therapy.

Lid Hygiene

Lid hygiene is generally recommended for patients with anterior blepharitis, and despite the number of products available (i.e., TheraLid™, Systane™ lid wipes, and I-Lid n’ Lash®), procedures for use have not been standardized. It is important that patients understand how to gently cleanse their lids and lashes and how to prevent the product from contacting and irritating the ocular surface. Products used for lid hygiene contain many components, some of which may not be listed on the label. Recently, products with tea tree oil have been recommended for blepharitis related to Demodex folliculorum (a parasitic mite). For example, shampoos, facial hygiene products, lid wipes (i.e. Cliradex) and solutions are being formulated in higher concentrations for in-office treatment of Demodex lid infestations.

Moisture Chamber Spectacles

Moisture chamber spectacles are a highly effective but underutilized option for increasing ambient humidity and minimizing the impact of environmental conditions on the ocular surface. Patients often start by wearing a pair of sunglasses to reduce symptoms in outdoor environments. If this is effective, they should be encouraged to use clear moisture chamber glasses indoors and outdoors in low light situations. A number of brands are available that allow for the incorporation of patients’ prescriptions; however, a good fit is critical to achieving comfort and success.

NONOCULAR CONSIDERATIONS

There are a host of non-ocular factors that contribute in varying degrees to the symptoms and signs of DED. Although many of these factors are non-modifiable, they are worth considering in order to educate patients on the role they play in the disease.

Ambient humidity, air movement and the use of computers and hand-held devices, are all important factors in DED. Maintenance of high ambient humidity is a critical step in the environmental modifications that can help patients to cope with tear evaporation. The use of small humidifiers in the office or home can improve symptoms dramatically. This strategy is especially useful in climates where air conditioning or heating are used for extended periods. Air movement by fans or wind is harmful to the fragile tear film and ocular surface, and could be protected against with moisture chamber goggles, or at the very least, by spectacles. Airplane and car travel are particularly bothersome and damaging. Ocular allergies may cause or exacerbate DED and use of oral antihistamines may further dry the tear film and worsen symptoms.

A large number of systemic medications have drying effects on the mucous membranes of the eyes (e.g. antihistamines, anti-depressants, diuretics). While these can be discussed with the patient and prescriber, essential medications will not normally be discontinued due to DED. Consumption of alcohol and exposure to cigarette smoke are environmental triggers that should be avoided.

Androgen/estrogen imbalance contributes to DED. Women are more affected than men. While clinical trials of both androgen and estrogen eye drops are ongoing, some patients may benefit from topical hormone therapies.

Continuous positive airway pressure (CPAP) for sleep apnea may exacerbate morning DED symptoms due to forced air escaping from poorly fitting masks. A flexible shield (Quartz) has been developed to protect the eyes while not affecting the fit of the CPAP mask.

The use of computers and hand-held devices is associated with episodic symptoms and exacerbations of chronic DED. It is important to evaluate time spent on these devices, blink
rate and completeness, and the role of CL wear. Computer workstations should be modified to ensure that screens are placed below the primary line of sight in order to minimize lid aperture width and subsequent tear evaporation.

MANAGEMENT OF CHRONIC DISEASE

Even with the diligent use of conventional (episodic) treatments (e.g. tear supplements, hot compresses), many patients with DED experience progression of symptoms and/or ocular surface signs. This is due, at least in part, to ageing, as all measures of tear function decline with age; however, the lack of targeted anti-inflammatory therapy, poor adherence and underlying chronic systemic diseases may also contribute to progression.

An abundance of research in the last decade has prompted a shift in thinking about DED. A self-perpetuating cycle is occurring on the ocular surface, whereby abnormal tear secretion alters the tear film composition and, in turn, increases tear film osmolarity. Increased tear film osmolarity stimulates the production of inflammatory mediators on the ocular surface, which causes the malfunction or destruction of cells that secrete various components of the tears.

As inflammation is the core mechanism responsible for chronic DED regardless of the cause, strategies aimed at arresting the cycle of inflammation are pivotal in healing the ocular surface, reducing symptoms and minimizing disease progression. Anti-inflammatory treatment involves a trial of a topical corticosteroid, which, if tolerated and successful, is followed by long-term immunomodulatory therapy. Regardless of the episodic treatment recommendations, anti-inflammatory therapy is at the forefront of the treatment paradigm for chronic disease. Breaking the cycle of inflammation early in the course of the disease may prevent the need for more substantial interventions as the patient ages.

SHORT-TERM ANTI-INFLAMMATORY TREATMENT

Corticosteroids

Corticosteroids are effective in relieving the symptoms and signs of chronic DED. As soon as the patient’s condition is identified as anything but episodic, a steroid trial should be initiated (subject to the usual cautions and contraindications). Not only are corticosteroids helpful to gauge the efficacy of anti-inflammatory therapy in an individual patient, but they are also used to ease a patient into long-term anti-inflammatory treatment options, primarily topical cyclosporine (Figure 10).
Specific signs and symptoms that might prompt the use of corticosteroids include ocular surface discomfort, obvious inflammation of the lids and ocular surface, corneal staining, low tear production, and inadequate relief of symptoms with hot compress and tear supplements. It is imperative to consider corticosteroid therapy when the conjunctiva and cornea show consistent signs of ocular dryness (e.g., by fluorescein or LG staining). However, long-term use is limited due to adverse effects such as cataracts, immunosuppression, and the potential for increased intraocular pressure (IOP)\(^{(101)}\).

While many topical corticosteroids have been evaluated and are effective\(^{(62)}\), the most obvious one to consider is loteprednol etabonate 0.5% (Lotemax\(^{®}\)), due to its similar efficacy, and superior safety profile compared to the most potent ketone-based topical corticosteroids.\(^{(102)}\) Loteprednol is less likely to cause an IOP spike, cataracts or delayed tissue healing than other similarly effective steroids.\(^{(98, 99)}\)

If a patient is unable to tolerate loteprednol, a preservative-free formulation should be considered. Methylprednisolone acetate 1% has shown favourable results in DED associated with SS, with all patients experiencing improvement in symptoms and signs within 8 weeks when used up to four times per day. Of note, improvement (measured by impression cytology) lasted an average of 56.6 weeks after a first pulse, and even longer after a second.\(^{(103)}\) This type of non-site-specific steroid has the potential to cause a significant increase in IOP and steroid-induced glaucoma, cataracts, as well as other adverse effects. For these reasons, these agents are generally reserved for patients in whom loteprednol cannot be used. Regardless of the corticosteroid product that is prescribed, the clinician should establish an appropriate follow-up schedule for each patient.

Generally, when inflammation is considered to be present in DED, loteprednol 0.5% is administered q.i.d and continued for 2 to 4 weeks, or sometimes longer, during which time efficacy, IOP and side effects are evaluated. If symptoms or signs improve, then treatment with cyclosporine 0.05% (Restasis\(^{®}\)) may be initiated. Barring any complications, the corticosteroid is continued concurrently at a reduced frequency with the cyclosporine for another 2 to 4 weeks to mitigate the transition to monotherapy with cyclosporine (Figure 10).

If inflammation of the lids is apparent, application of a topical corticosteroid ointment such as dexamethasone 0.1%, or loteprednol 0.5% is appropriate and may precede use of loteprednol drops. Alternatively, use of an antibiotic-steroid combination product may be considered (e.g., tobramycin 0.3%/dexamethasone 0.1% (Tobradex\(^{®}\)), neomycin 0.35%/polymyxin B/dexamethasone (Maxitrol\(^{®}\)).

Non-steroidal anti-inflammatory drugs
Non-steroidal anti-inflammatory drugs (NSAIDs) have a limited role in the management of DED. Their main use is to reduce or eliminate the pain and abnormal membrane-bound mucin layer associated with filamentary keratitis.\(^{(104, 105)}\) However, this may also be accomplished with corticosteroids. Topical NSAIDs, especially generic versions, must be used with caution as corneal melting has been associated with chronic use after surgery and in patients with uncontrolled autoimmune disease.\(^{(106)}\)

LONG-TERM ANTI-INFLAMMATORY TREATMENT

**Topical cyclosporine**

Topical ophthalmic cyclosporine 0.05% (Restasis\(^{®}\)) formulated with castor oil as an emulsion vehicle is an effective and safe treatment for chronic inflammation on the ocular surface. Cyclosporine modulates T-cell-mediated inflammation and, although some patients may report symptomatic improvement in as little as a couple of weeks, it may take 3 months or longer to show a demonstrable effect in symptoms or signs.

The use of this drug is evolving. The original approval for topical cyclosporine was based on an increase in tear flow. Treatment with topical cyclosporine is commonly used in moderate to severe DED but it has been shown to prevent progression in patients with milder forms of
7. Specific Diseases, Disorders and Procedures

7.11 Patients With Dry Eye Disease

DED. Cyclosporine is also useful for the long-term treatment of MGD. Indeed, long-term treatment with cyclosporine outperformed a combination of tobramycin/dexamethasone in patients with posterior blepharitis.

Before initiating treatment with cyclosporine, it is important to discuss the course of the treatment in order to manage patient expectations. While improvement in signs and symptoms can be seen within the first 8-12 weeks of treatment, patients with severe chronic or recalcitrant disease can take up to a full year to experience improvement. It is important to use the treatment long enough to evaluate the condition properly and to encourage adherence at follow-up visits. Photodocumentation can help a patient to understand small and subtle changes in their ocular condition, and is helpful to increase treatment adherence. Clinical positive outcomes can be noted earlier if an anti-inflammatory treatment is instituted before application of cyclosporine.

The main adverse effect noted with cyclosporine is burning on instillation, which was experienced by 17% of subjects in a clinical trial (10% higher than that associated vehicle alone). Cyclosporine is not associated with steroid-induced ocular adverse effects, and given the need for long-term therapy in chronic DED, the long-term safety profile is one of the key benefits of cyclosporine.

Essential fatty acids

The role of essential fatty acid (EFA) supplementation in the treatment of DED is evolving. However, clinical recommendations vary because the most effective form of EFA and the optimal dosing regimen is yet to be determined.

EFAs, such as omega-3 fatty acids, are essential nutrients that must be acquired in the diet. They include docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), which are found in cold-water fish such as mackerel, anchovies, sardines, albacore tuna, and salmon, and alpha-linolenic acid (ALA), which is found in plant sources such as flaxseed, for example, but must be converted to EPA and DHA to be used by the human body.

Gamma-linolenic acid (GLA) is an omega-6 EFA with anti-inflammatory properties that is found in black currant seed oil, evening primrose oil and to a lesser extent borage oil. GLA must be combined with EPA/DHA at a minimum ratio of 1:1, otherwise there is a risk that it will have proinflammatory effects. In the presence of EPA/DHA, GLA has been shown to have significant anti-inflammatory properties and to be effective in DED with an inflammatory component. GLA has been shown to be useful in the management of CL-associated DED, KCS associated with SS, and post refractive surgery DED. Moreover, GLA has been shown to improve signs and symptoms of moderate to severe KCS with inflammatory components, and DED associated with MGD.

While the best form and optimum dose of EFA continues to be debated, it is clear that these compounds have anti-inflammatory effects, and are helpful for the treatment of DED.

ADJUNCTIVE TREATMENTS

In addition to corticosteroids and topical cyclosporine, a number of other treatments with anti-inflammatory properties are available for the treatment of DED, but are not recommended in all patients. Those listed in this section are indicated when certain lid diseases, specifically MGD with or without rosacea, are a significant component of DED.

Oral tetracyclines/macrolides

Tetracyclines are used extensively in the treatment of MGD and ocular and facial rosacea. Oral macrolides may be considered when tetracyclines are contraindicated, or in the event of unacceptable adverse reactions. More recently, a topical macrolide, azithromycin, has been developed.

Tetracyclines (tetracycline, doxycycline and minocycline) have properties that are useful in
the management of DED. In addition to their antibacterial properties, these drugs also inhibit bacterial lipases, thereby reducing production of free-fatty acids in the lipid component of MG secretions and the tear film.\(^{(90)}\) They also have anti-inflammatory properties, including inhibition of matrix metalloproteinases (MMP), phospholipase A2, and collagenase. The anti-inflammatory effects can also prevent the development of new blood vessel formation (corneal neovascularization) in rosacea.

The most commonly used tetracycline in eye care is doxycycline, which may be given at a dose of 40 or 50 mg once daily for MGD.

Patients with contraindications to tetracyclines, including children and pregnant or nursing women, may benefit from a course of an oral macrolide antibiotic, such as erythromycin or azithromycin, although the dosage and time course have not been well studied.\(^{(123, 124)}\)

**Lacrimal occlusion**

Tear retention by lacrimal occlusion decreases symptoms, reduces corneal staining, prolongs TBUT, increases goblet cell density and decreases tear film osmolarity.\(^{(125, 126)}\)

It is intuitive to consider lacrimal occlusion in patients with aqueous deficiency. Consider lacrimal occlusion for patients with <15 mm of wetting, and especially for patients with <10 mm wetting on the PRTT/CTT.

Control of inflammation is an important consideration. Impaired tear drainage may prolong the contact of pro-inflammatory mediators with the ocular surface. Conversely, tear film osmolarity may decrease and attenuate the inflammatory cascade. Normally, MGD and ocular surface inflammation should be controlled by a course of anti-inflammatory treatment before lacrimal occlusion is undertaken. However, this may be challenged in cases of severe aqueous deficiency (e.g. PRTT < 5 mm), when lacrimal occlusion is required to facilitate tear retention earlier in the course of treatment of a very dry eye.

Lacrimal occlusion is also indicated in CL intolerance, filamentary keratitis, neurotrophic corneas (with or without keratitis), cranial nerve VII (CN7) palsies and systemic diseases such as SS, Stevens-Johnson syndrome, graft versus host disease (GVHD), and others.

For patients with an occluded canaliculus, active canaliculitis, allergies to the materials, or frank punctal ectropion, lacrimal occlusion is contraindicated.

The most common complication is spontaneous extrusion of the plug(s) which necessitates replacement. Other complications include internal migration of punctal plugs, the inability to irrigate intracanalicular plugs, and pyogenic granuloma formation.\(^{(125, 126)}\)

**Meibomian gland expression**

Although MG expression is a diagnostic procedure that reveals the quality and quantity of secretions (see previous section), it is also a therapeutic procedure that promotes normal gland function. Techniques include simple application of pressure to the lid\(^{(127)}\) or placement of a metal object (e.g. Mastrota paddle) behind the lid to reduce pressure on the globe.

A novel thermal pulsation system for MG expression is available (LipiFlow®). The system heats the MG and expresses their secretions using a pulsatile inflatable cup. Symptoms and some objective signs (MG secretions, corneal staining and TBUT) improve with a single treatment and may be maintained for up to 9 to 12 months.\(^{(128)}\) Further study is needed to determine the outcomes of single and repeated treatments.

**Sleep masks and lid taping**

Patients in whom lid closure is inadequate, especially during sleep, may benefit from lid taping, night-time masks or patches. Patients must be instructed on proper technique to protect the vulnerable ocular surface from trauma.
7.11 Patients With Dry Eye Disease

MANAGEMENT OF RECALCITRANT DISEASE

Ocular

Scleral contact lenses

Traditional contact lenses are generally avoided in patients with severe DED disease, except to act as bandage lenses for patients with a high degree of corneal staining. However, scleral lenses, commonly used for treatment of an irregular cornea, may also be used for treatment of severe DED, including SS, neurotrophic keratitis and other surface disorders. A number of different lenses, including scleral lenses, have been used to treat patients with SS, irregular astigmatism, exposure keratitis, and other ocular surface conditions. All types of scleral lenses are designed to protect and heal the ocular surface, and to improve vision. They are suitable in addition to standard treatments.

Materials that allow high oxygen delivery and a limited amount of clearance under the lens are required in order to promote corneal and conjunctival metabolism, especially in the presence of altered endothelial cells. Patients with severe disease benefit from large diameter lenses (18-20 mm) while those with less severe disease may use mini-scleral lenses (14.5 to 16 mm), which are easier to fit and to handle.

Topical medications, including anti-inflammatories, can be used concomitantly with scleral lenses. Scleral lenses are available in designs made for regular corneae as well and can be used to address episodic eye dryness related to contact lens wear. Well fitted scleral lenses may provide the same comfort as soft lenses, and provide the same quality of vision as gas permeable lenses, but offer the unique advantage of preserving hydration over time. By bathing the cornea on a constant basis, they can help to improve the patient’s comfort and alleviate end-of-the-day dryness.

Autologous serum eye drops

Autologous serum eye drops are made from the liquid component of the patient’s own blood and contain a number of components found in natural tears that are involved in maintenance of the ocular surface, such as epidermal growth factor, transforming growth factor B, fibronectin, vitamin A and cytokines.

Autologous serum eye drops are generally reserved for patients with severe disease whose treatment options have been exhausted. This is due, in part, to cost, but also to the lack of regulatory standards for serum preparation and storage, and to a paucity of data on which to standardize indications, to establish risks and contraindications, and to guide patient selection. There are few centres that offer this therapy, and those that do are generally located in teaching hospitals. Autologous serum eye drops promote healing of the cornea with few adverse effects; however, the preparation, concentration (20%, 50%), and dosing frequency and duration are not standardized.

Amniotic membrane transplants

Sutureless amniotic membrane transplants (ProKera®, Biotissue) are an option for patients with severe recalcitrant DED and other ocular surface disorders. The device consists of a piece of amniotic tissue held in place by two clear, flexible rings. Healing of corneal lesions has been reported in 44 to 70% of patients depending on the indication. Some patients experience discomfort after placement of the device and recurrence of the primary pathological condition.

Tarsorrhaphy

Tarsorrhaphy may be a temporary or permanent procedure used to narrow the palpebral fissure in patients with non-healing ocular lesions associated with corneal exposure, severe dryness and loss of corneal sensitivity. Graves disease and CN7 palsies are examples of conditions that can cause extreme corneal exposure. Severe dryness may occur with or without systemic disease, but classic examples that may require surgical interventions include Stevens-Johnson syndrome, ocular cicatricial pemphigoid, and SS. Corneal hypoesthesia or anesthesia also puts the cornea at risk as does the inability to heal in conditions such as post-corneal surgery, radiation keratopathy and recurrent or recalcitrant neurotrophic ulcers.
Systemic treatments
Secretagogues
The muscarinic agonist pilocarpine (Salagen®, 5mg) is indicated for the treatment of dry mouth in patients with SS. Use of this oral formulation is limited due to its adverse effect profile and its q.i.d. dosing. Many patients experience significant adverse effects such as excessive sweating (hyperhidrosis, in over 40% of patients), flushing, chills, nausea, and rhinitis especially at the maximum dose. For this reason it is advisable to start with one daily dose for one to two weeks, then increase to b.i.d. and so on, to allow the patient to become accustomed to the medication. Many patients are unable to reach the full dose, but may be helped by smaller amounts of the drug.

Immunosuppressants
Some immunosuppressive therapy improves symptoms in patients with SS; however, no agents are currently approved for use in this condition. Rituximab has shown some promise by improving salivary flow rate, symptoms, some ocular signs, as well as extraglandular manifestations and some laboratory parameters.\(^{140}\)

CONCLUSIONS
By defining a more intuitive approach to clinical assessment (episodic, chronic, recalcitrant), the authors hope to help practitioners in the effective assessment and management of the many patients who present to clinical practice with varying levels of symptoms and signs of DED. Beginning with a screening process that involves a series of key questions and an understanding of the predisposing factors that contribute to DED, doctors can more readily differentiate DED from the many conditions that mimic the symptoms. A full DED workup is recommended after confirming the diagnosis, as well as to identify any co-morbidities. Armed with this information, the clinician can readily develop a treatment plan tailored to each patient’s condition.

A great deal has been learned about the complexity of DED in the last two decades. The awareness of the inflammatory model of DED is growing, as is the understanding of the long-term management of this spectrum of conditions. Contemporary use of anti-inflammatory treatments has dramatically improved our ability to positively affect patient experience of this chronic disease. Current investigations focusing on the inflammatory model will lead us to future treatment options, and the ability to further improve the quality of life of patients with DED.

REFERENCE LIST
7.11 Patients With Dry Eye Disease

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7.11 Patients With Dry Eye Disease


95. Ousler GW, Wilcox Ka, Gupta G, abelson MB. an evaluation of the ocular effects of topical cyclosporine 0.05% for the prevention of dry eye disease. Adv Ther 2008 Sep;25(9):558-570.


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SUPPLEMENTARY APPENDIX

ADJUNCT TESTING AND EMERGING TECHNOLOGIES

The tests described in this section represent emerging technologies that the practitioner may find useful for performing certain assessments in select patients. The Supplementary Table summarizes the equipment that is useful in a dry eye disease (DED) clinic, and includes the time required to administer the test and, where available, the sensitivity and specificity of each test.

NASOLACRIMAL ROUTE PATENCY

The Jones test involves the assessment of the patency of the nasolacrimal duct. Briefly, 2-3 fluorescein strips are placed in the eye and the patient is asked to blink several times to allow the fluorescein to enter the nasolacrimal passageway via the punctum. The presence of fluorescein in the ipsilateral nostril indicates that the passageway is functional. This is a good additional test in patients that complain of epiphora (excessive tearing) to rule out if the nasolacrimal route is blocked.

EVALUATION OF TEAR OSMOLARITY

Osmolarity measures the concentration of ions or particles in fluids such as tears. Osmolarity testing should be performed prior to any other test that requires tear and/or lid manipulation, so as not to potentially affect the results of subsequent tests.

All fluids in the body, including tears, have electrical conductivity properties, depending on the ionic content of the tissue. Any change in the concentration or composition of ions, such as in DED, will affect conductivity. The TearLab Osmometer measures tear film osmolarity using electrical impedance in a 50 nl sample obtained from the lower tear meniscus.

The osmolarity value indicates the severity of DED. A value of more than 308 mOsm/L is indicative of DED and asymmetry between the two eyes is expected, especially with increasing severity. Measurements less than 308 mOsmol/L indicate no DED.

The unit has two handles, one for each eye. The individually-packaged disposable tips are inserted onto the handle, after which there is a 2-minute time window to take the measurement. The tip is lowered gently onto the lower temporal tear meniscus and the appearance of an indicator light and an auditory prompt indicates that the required amount of tears (50 nL) has been collected. The handle is then docked onto the base and a reading of the osmolarity is given within a few seconds.

The instrument is user friendly with a quick learning curve (2-3 patients). It is advised to leave the instrument on during the week, as older units take 20-25 minutes to initialize. The newer models only require 5 minutes. Calibration of the unit is recommended every time you open a new box of tips (42 tips/box).

Supplementary Figure 1. TearLab osmometer.
**LIPID LAYER ASSESSMENT**

Specialized instruments are available to view the lipid layer of the tear film specifically, which is becoming increasingly important as evaporative DED becomes a more prominent concern. The Tearscope (Keeler) uses Ganzfeld-type illumination to view the lipid layer while at the slit lamp and provides a subjective assessment of the thickness of the lipids. This instrument is no longer commercially available. The LipiView/LipiFlow® system uses interferometry to view the thickness and quantity of the lipid layer. A lipid layer thickness profile is calculated, which provides an indication of the potential for evaporative DED. The instrument comprises two components, LipiView and LipiFlow®, the latter of which is a therapeutic component (see section on treatment).

The lipid layer creates an interference pattern on the ocular surface that can be used to estimate its thickness. The LipiView system uses interferometry to assess the thickness profile of the lipid layer which can be used diagnostically, and to monitor treatment or post-surgical outcomes.

**INFLAMMATORY BIOMARKERS**

MMP-9 is a non-specific marker of inflammation that is typically found in very low concentrations on the ocular surface in normal individuals and in higher levels in patients with inflammation, such as DED. InflammaDry® measures MMP-9 levels on the ocular surface within 10 minutes of tear collection. An MMP-9 level >40 ng/mL is highly correlated with moderate to severe DED.

**MEIBOMIAN GLAND ASSESSMENT**

Supplementary Figure 3. InflammaDry® used to collect tears from the lower conjunctiva for analysis of MMP-9 biomarker.
The Keratograph (Oculus®) is one of the latest emerging technologies for the assessment of the cornea and tear film. The instrument includes a corneal topographer, an infrared light MG evaluator (Meibo-Scan), and tools for measuring tear meniscus height (TMH), non-invasive TBUT assessment, bulbar conjunctival redness and tear film dynamics. The Meibo-Scan allows the practitioner to assess the linearity and regularity of the MG in both lids. Information regarding how bent or curved the MG may point towards early signs of MG problems.

**Supplementary Figure 4. Keratograph 5M (Oculus).**

**Supplementary Table. Summary of equipment.**

<table>
<thead>
<tr>
<th>Test</th>
<th>Manufacturer</th>
<th>Time to administer</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
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<tr>
<td>OSDI</td>
<td>Allergan</td>
<td>&lt; 1 min</td>
<td>80%</td>
<td>79%</td>
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<td>McMonnies</td>
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<td>&lt; 1 min</td>
<td>98%</td>
<td>97%</td>
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<td>DEQ-5</td>
<td>Indiana University</td>
<td>&lt; 1 min</td>
<td>90%</td>
<td>81%</td>
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<td></td>
<td></td>
<td></td>
<td>(if score &gt;6)</td>
<td>(if score &gt;6)</td>
</tr>
<tr>
<td>TearLab Osmometer</td>
<td>TearLab</td>
<td>&lt;2 min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schirmer</td>
<td>Several available</td>
<td>5 min</td>
<td>85%</td>
<td>83%</td>
</tr>
<tr>
<td>CFT, PRFT (ZoneQuik)</td>
<td>Menicon</td>
<td>15 sec</td>
<td>86%</td>
<td>83%</td>
</tr>
<tr>
<td>Mastrota Paddle</td>
<td>Ocusoft</td>
<td>&lt;1 min</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>MG Evaluator</td>
<td>Tearscience</td>
<td>&lt;1 min</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Ophthalmic dyes</td>
<td>Several available</td>
<td>&lt;2 min</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Yellow Barrier filter</td>
<td>Most GP CL labs</td>
<td>&lt;1 min</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>InflammaDry</td>
<td>Labtician</td>
<td>10 min</td>
<td>85%</td>
<td>94%</td>
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<td>Keratograph</td>
<td>Oculus</td>
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<td>N/A</td>
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<td>Tearscience</td>
<td>LipiView: &lt;5 min</td>
<td>N/A</td>
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</tbody>
</table>
7.12 Patients With Amblyopia

Description
Amblyopia (lazy eye) is characterized by reduced best-corrected visual acuity in one or both eyes, without disease or structural abnormality of the eye or visual pathways. It is caused by an interruption of visual sensory stimulation (due to strabismus, uncorrected refractive error or visual deprivation) occurring early in life during the visual-sensitive period. Children and adults with amblyopia commonly experience reduced vision and eye co-ordination that may impact academic, recreational and occupational accomplishments. Optometrists provide diagnosis and treatment of amblyopia, its causes and associated functional visual deficits.

Regulatory Standard
The Professional Misconduct Regulation (O.Reg. 119/94 Part I under the Optometry Act) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

8. Failing to reveal the exact nature of a secret remedy or treatment used by member following a patient’s request to do so.

9. Making a misrepresentation with respect to a remedy, treatment or device.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

29. Charging or allowing a fee to be charged that is excessive or unreasonable in relation to the professional services performed.

Professional Standard
Diagnostic evaluation of new patients with, or suspected of having, amblyopia incorporates:

- comprehensive case history including:
  - prior eye conditions, diseases and treatments
• family history of amblyopia, strabismus and other eye conditions
• developmental history including birth weight, pre-/peri-natal history
  (specifically alcohol, tobacco or drug use during pregnancy), as indicated
• visual acuity
• cycloplegic refraction (OPR 7.6)
• ocular motility and alignment
• dilated anterior and posterior segment examinations (OPR 6.1 and OPR 6.2)

Given that amblyopia is considered a diagnosis of exclusion, additional investigations are performed as needed to rule out other causes of reduced vision.

**Treatment** for amblyopia involves:

• consideration of prognostic factors (including but not limited to patient age, cause of amblyopia, degree of amblyopia) and patient education regarding realistic goals, limitations and estimated time frame of available treatment options
• optical correction, as required
• occlusion treatment or pharmacological penalization, as indicated
• vision therapy for monocular and binocular visual function, as required
• referral (OPR 4.5) for surgical correction of associated conditions (such as strabismus, ptosis, etc.), as indicated
• patient education regarding the impact of amblyopia on eligibility for specific occupations, increased risk for eye injury and the importance of eye protection
• provision of a prescription for protective eyewear

**Continuing care** of established patients previously diagnosed with amblyopia is done at appropriate intervals. Patients involved in active amblyopia therapy are seen frequently, to assess progress and modify treatment as needed, while others are seen regularly, as indicated. Continuing care includes:

• history concerning any changes in vision or visual function and patient compliance with prescribed treatment
• re-assessment of best-corrected visual acuity and binocular status
• re-assessment of ocular health status with special attention to the ongoing health of the non-amblyopic eye
• modification of the treatment plan, as indicated, to improve the effectiveness of treatment and/or to better meet patient needs and expectations
Optometrists must stay abreast of developments in evidence-based treatment for amblyopia and ensure that their patients have access to such treatment where clinically beneficial.

**Clinical Guideline**

Comprehensive care for amblyopia addresses associated functional visual deficiencies, in addition to the primary visual acuity, refractive and binocular deficits:

- increased sensitivity to contour interaction effects
- abnormal spatial distortions and uncertainty
- unsteady and inaccurate monocular fixation
- poor eye tracking
- reduced contrast sensitivity
- inaccurate accommodative response

Such deficiencies affect visual acuity, patient symptoms and the response to treatment. Assessment and management of these deficits may improve the success of amblyopia treatment.

Additional references relevant to this topic are:

2. Pediatric Eye Disease Investigator Group publications. ([http://pedig.jaeb.org](http://pedig.jaeb.org))
7.13 Patients With Uveitis

**Description**

Uveitis is an inflammatory condition of the eye that may be classified anatomically (based on the part of the eye primarily affected) as anterior, intermediate, posterior, or panuveitic, or based on duration as acute when the condition lasts less than two months, chronic when it lasts longer than two months, or as recurrent when repeated episodes are separated by several months of inactivity.

**Anterior uveitis**, also known as *iritis*, is inflammation of the iris and ciliary body. As many as 90% of uveitis cases are anterior in location.

**Intermediate uveitis**, also known as *pars planitis*, is inflammation of the vitreous cavity (vitritis) sometimes with snowbanking, or deposition of inflammatory material on the pars plana.

**Posterior uveitis**, also known as *chorioretinitis*, is inflammation of the choroid that may secondarily involve the retina (chorioretinitis).

**Panuveitis** is inflammation of the entire uveal tract involving both the anterior segment (iris and ciliary body) and the posterior segment (choroid).

These conditions may occur as a single episode, subsiding spontaneously or with proper treatment, or may become chronic or recurrent in nature.

The practice of optometry includes the diagnosis, treatment and, when appropriate, referral of patients with uveitis.

**Regulatory Standard**

The Professional Misconduct Regulation (*O.Reg. 119/94 Part I under the Optometry Act*) includes the following acts of professional misconduct:

3. Doing anything to a patient for a therapeutic, preventative, palliative, diagnostic, cosmetic or other health-related purpose in a situation in which a consent is required by law, without such a consent.

7. Engaging in the practice of the profession while in a conflict of interest as described in Part II.

8. Failing to reveal the exact nature of a secret remedy or treatment used by the member following a patient’s request to do so.

9. Making a misrepresentation with respect to a remedy, treatment or device.

10. Treating or attempting to treat an eye or vision system condition which the member recognizes or should recognize as being beyond his or her experience or competence.

11. Failing to refer a patient to another professional whose profession is regulated under the Regulated Health Professions Act, 1991 when the member recognizes or should recognize a condition of the eye or vision system that appears to
require such referral.

13. Recommending or providing unnecessary diagnostic or treatment services.

14. Failing to maintain the standards of practice of the profession.

16. Performing a controlled act that the member is not authorized to perform.

### Professional Standard

When providing care to patients with uveitis, optometrists will:

- have the required knowledge, skill and judgment to appropriately diagnose, treat and/or refer patients with uveitis

- utilize appropriate instrumentation and techniques to diagnose uveitis and identify any ocular or systemic conditions that may complicate the condition. As a minimum, this would include:
  - a thorough ocular and systemic history
  - unaided and/or best corrected visual acuity
  - pupil reflexes
  - anterior segment examination (OPR 6.1)
  - tonometry
  - posterior segment examination (OPR 6.2)

- provide treatment options that include, as indicated:
  1. topical corticosteroids to reduce inflammation
  2. topical cycloplegics to relieve pain, prevent iris adhesion to the anterior lens capsule (synechiae), and prevent protein leakage from inflamed blood vessels (flare)
  3. topical non-steroidal anti-inflammatory drugs (NSAIDs) to reduce inflammation leading to macular edema that may accompany uveitis
  4. topical intraocular pressure (IOP) lowering medications to reduce elevated IOPs
  5. over-the-counter oral analgesics to reduce pain

- arrange follow-up every 1-7 days until resolution and then as deemed appropriate to monitor for recurrence

- counsel patients regarding the serious nature of uveitis, stress compliance with the therapeutic regimen and follow-up appointments, and discuss potential side effects of long term corticosteroid use

- recommend referral (OPR 4.5) when appropriate, including initiating communication with the patient’s primary care physician or another health care provider for
evaluation and treatment if a systemic etiology is suspected (for example: when the condition is recurrent or bilateral, non-responsive to aggressive treatment, is accompanied by clinical signs or symptoms characteristic of systemic disease (including but not limited to: joint or lower back pain; respiratory, genitourinary or digestive difficulties; preceding or accompanying fever, malaise or skin rash) or involves the choroid as posterior uveitis), or when recalcitrant cases of uveitis require oral steroids or prescription analgesics where topical steroids or over-the-counter analgesics have produced little response.

**Clinical Guideline**

In addition to the normal complement of required clinical information to be obtained for patients, certain supplementary ocular procedures may be useful in some cases, including but not limited to gonioscopy, diagnostic imaging, and intravenous fluorescein angiography.

**Coordination of Care**

It is always beneficial to send written reports about patients with uveitis to participating members of their health care team and to keep copies of such documentation in the patient record. Patients should be reminded of the importance of continued compliance with their primary healthcare practitioner's recommendations.

Additional references relevant to this topic are:

American Optometric Association Clinical Practice Guidelines:

- Care of the Patient with Anterior Uveitis ([www.aoa.org](http://www.aoa.org))

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