WOMEN’S HEALTH ISSUES IN OPTOMETRIC PRACTICE
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Course description: It is important for health care practitioners to understand the issues that occur more commonly in women. Awareness will often lead to better and more appropriate care for the female patient.

INTRODUCTION

It is hardly a profound statement to observe that women are different than men, and very frequently the differences makes it important for health care practitioners to be aware of health problems that occur more commonly in the female population. Awareness of the above will often lead to better and more appropriate care for the female patient.

There are many diseases and disorders which are quite commonly seen in female patients that are much less commonly seen in men, such as the autoimmune diseases, however, women live significantly longer than do men. Unfortunately for the female population, they do experience more illness and have more "sick time" than do men on average.

In no way is this presentation to be considered "exhaustive" on the subject of female health Issues. Rather, the following is a discussion of several diseases and disorders which are commonly diagnosed in the optometric practice and which occur more frequently in the female patient than in the male patient. This is particularly important as optometrists are recognized as independent health care practitioners and are quite often the doctor of first contact when symptoms lead to a doctor's office visit by the patient.

LEARNING OBJECTIVES

This course will review the signs and symptoms of the various diseases that occur more frequently in women than in men, including specific examples in these classes of diseases:

• Infection
• Tumor
• Trauma
• Allergic
• Autoimmune
• Congenital
• Metabolic

Also, the implications for the practice of optometry are discussed.

PRESENTATION BY DISEASE CLASSIFICATION FORMAT
There are only a limited number of underlying “causes” of diseases and disorders which affect human tissues and organs. This course will present eight (8) categories of basic, underlying etiologies for the various diseases and disorders more commonly observed to occur in females than in males. These are: infection, tumor, trauma, allergic, auto-immune, congenital, metabolic and “idiopathic” (no known reason for the disease/disorder).

These various diseases and disorders lead to a shortening of the life expectancy. Theoretically, a human body should live about 120 years, however, women only live on average to about age 80 and men on average to about 75. So….the various diseases and disorders basically cheat the average person out of 40 years of life!! It is currently proposed that a genetic predisposition due to abnormalities on the genetic apparatus coupled with environmental insults (viruses, oxidants, toxins, etc.) activate diseases and disorders.

1. **INFECTIONS THAT OCCUR MORE COMMONLY IN FEMALE PATIENTS**

The optometrist is very often the doctor a patient will see when there is an infectious process affecting the eye. One question that must be answered is what kind of infection is it that the patient has and is it a sexually transmitted infection.

1. The various sexually transmitted diseases with ocular presentations are reported to be more common in females than males. Additionally, for some unexplained reason these diseases are very often asymptomatic in females whereas in males there are usually significant symptoms related to the genitor-urinary system. The ocular manifestations of these diseases usually do cause symptoms and therefore may be the only reason the patient will seek health care for the problem. Specifically, genitourinary tract infections due to the Gonococcus and the Chlamydia organism are both often completely asymptomatic in women, therefore, women are less likely to get treatment, however, these diseases lead to symptoms in males who more likely therefore seek treatment. However, in both these diseases if the eye is involved the patient will seek treatment. See Figure 1.
Figure 1: Bacterial Conjunctivitis

2. The Gonococcus microorganism which is responsible for gonorrhea is often asymptomatic for genitor-urinary symptoms in the female patient. However, if the organism infects the eye, there are usually significant symptoms and a severe muco-purulent discharge from the conjunctiva. Gram stain of the inflammatory exudate reveals gram negative diplococci that may even be observed to have been engulfed by the Polymorphonuclear White Blood Cells. See Figure 2.

Figure 2: Gonococcus

3. Follicular conjunctivitis is commonly due to Chlamydia therefore follicles in the presence of a severe mucopurulent conjunctivitis in a female patient should lead the optometrist to consider a sexually transmitted disease even without other symptoms. However, when these diseases occur in males there is very commonly a urethra discharge and symptoms of urethritis (dysuria and urethral discharge). Again, for unexplained reasons, the female patient often has no symptoms of urethritis. See Figure 3.

Figure 3: Follicular Conjunctivitis

4. HIV/AIDS –
AIDS devastates the T Lymphocytes of the helper (CD4) cell line leading to severe acquired immunodeficiency. There are resulting problems such as cancer (lymphoma, Kaposi's sarcoma, etc.), opportunistic infection (cytomegalovirus, pneumocystis carinii pneumonia, cryptococcus neoformans meningitis, etc.), and ultimately death. The virus must enter the bloodstream in order to have its effect on the immune system and subsequently enters CNS cells, macrophages, T Lymphocytes, and probably most other cells. The disease AIDS is primary spread by contact with the sexual secretions of infected individuals and by contact with or injections of blood or blood products.

It has also recently been reported that the incidence of AIDS is higher in females than males in places with epidemic HIV infection, like certain countries in Africa. The reason for this is mostly unclear but one factor is thought to be that it is easier for one infected male can spread the disease to many women than the converse.

The AIDS virus is known to attack the retina and also to cause the incidence of infections of the eye to increase due to the immune system being depressed in the presence of the HIV virus. One sign of AIDS is the occurrence of Kaposi's Sarcoma which is a malignancy of blood vessels. The eyelid is a site that these cancers may occur. See Figure 4.

![Figure 4: Kaposi’s Sarcoma in AIDS](image)

Thus, while HIV positive patients are regularly encountered in many optometric practices in the U.S., the so-called “cocktail” of medicines most of these patients now take makes progression to AIDS rare. In other countries where access to pharmaceuticals may be more difficult, this may not be the case.

I. TUMOR

The definition of “tumor” is abnormal new cell growth which is not subject to normal growth regulation (the cell growth is uncoordinated) and is at the expense of the health of the rest of the body. Therefore tumor cells are characterized as cells that are autonomous (uncontrolled by normal body
growth factors), undergoing rapid reproduction (much faster than normal cells),
and that are parasitic (the cells gets their nutrition when the rest of the body is
suffering for nutrition). See Figure 5.

![Image of cancerous tumor](image)

**Figure 5: Non-pigmented cancerous tumor of the retina**

For demonstration purposes, presentations of Cancer of the Breast, Lung and
Malignant Melanoma affecting the eye are presented.

1. Breast Cancer - breast cancer is almost (but not quite!) exclusively a
female disease and therefore this life-threatening cancer is much more
commonly diagnosed in women, but that this type of cancer definitely
affects men too is well-known. It is reported that less than ten percent
(10%) of breast cancer occurs in males. One fairly common site for
metastasis of breast cancer is to the Choroid and the Cavernous Sinus.
Metastases to both of these areas are associated with symptoms related to
vision that may cause the patient to seek optometric care. See Figure 6.
2. Lung Cancer - In the past, cigarette related lung cancers were much more common in males but this is no longer true as the percent of men and women who smoke is now virtually identical and, therefore, the incidence of cancer of the lung has dramatically increased in women to the same level of that for men. See Figure 7.

3. Malignant Melanoma – The incidence for occurrence of this type of cancer on the skin is dramatically increasing. Malignant Melanoma occurs more frequently with a history of severe or repeated sunburn. Presently there is concern that Tanning Booths are contributing to this increase in incidence due to the Ultraviolet Light penetrating deeper into the skin than does natural sunlight. Women utilize artificial tanning more frequently than men and it is feared that more women than men will develop malignant melanoma in the future as a result of utilizing tanning booths. Malignant Melanoma of the Choroid is a diagnosis commonly made in the optometrists office. Malignant Melanoma has a genetic predisposition and the genetics are pretty well worked out for its development. See Figure 8.
II. TRAUMA

Accidents and domestic violence are the leading causes of trauma that may result in a visit to the optometrist's office. See Figure 9.

1. Accidents – it is interesting to note that the incidence of accidents occur more commonly for men than for women and therefore the incidence of trauma is much higher for men than it is for women. This is considered to be primarily due to the fact that men are generally prone to a much higher incidence of risk taking resulting in an accident as well as the incidence of men in being employed in more dangerous occupations than for women is well known. However, accidental falls with resulting femoral (hip), radial/ulnar (wrist) fractures are much more common in the elderly female patient due to the bone thinning effects of osteoporosis (discussed later in this presentation). The most common cause of an accidental fall is due to the patient failing to see an object or step due to poor vision. Therefore, good optometric care of these vision problems prevent falls and the resulting trauma! See Figure 10.
3. Domestic Violence – it is well documented that women are the victims of domestic violence at a staggering rate compared to domestic violence involving men. With domestic violence, injuries to the eye and the tissues around the eye are very common when direct physical trauma occurs, e.g., striking a person in the face with the closed fist or open hand. See Figure 11.

Therefore, when the optometrist is caring for a patient with multiple contusions, contusions around or near the eye, subconjunctival hemorrhages, hyphema, retinal detachment, etc. the optometrist must keep in mind that these injuries may be manifestations of domestic violence and not due to "accidental" trauma from a fall, running into a door, etc. See Figure 12.
Figure 12: Ocular consequences of domestic violence: ecchymosis and hypehema

There is often a reason for the optometrist to consider domestic violence when examining a patient with signs of trauma when the “supposed” reason for the trauma does not “match” the expected clinical observations. The following outlines the many items that are RISK FACTORS for the possibility of a patient being subjected to domestic violence in their relationship. See Figure 13.

Figure 13: Skull fracture in domestic violence survivor

DOMESTIC VIOLENCE RISK ASSESSMENT

1. Are you Afraid of your partner?
2. Do you “walk on eggshells” to prevent your partner’s anger?
3. Are you emotionally abused with insults, sulking for making suggestions?
4. Are you limited on friends, dress and other elements of life and relationships?
5. Does your partner exhibit jealousy for no reason?
6. Does your partner use “pushing” or “shoving” or “grabbing” to get their way?
7. Does your partner have extreme and unpredictable mood swings (kind-cruel)?
8. Do you change your life in order to prevent your partner from getting angry?
9. Does your partner make all the financial decisions without your input?
10. Is it impossible for you to freely express your values and opinions?
An answer of “yes” to TWO or more of the above 10 questions means that the patient may be in an abusive relationship.

III. ALLERGIC

TYPE 1: ANAPHYLACTIC REACTION OR IMMEDIATE HYPERSENSITIVITY

A. Reaginic activity refers to an antigen that induces a Type 1 response immunologically. This can be a severe, potentially fatal allergic reaction. It occurs virtually immediately upon exposure to an antigen that has previously "sensitized" the host.

B. The sequence of events is like this - exposure to a specific antigen in genetically predisposed person, formation of IgE, IgE binds to Mast Cells and basophils everywhere (no complement involved), on re-exposure the mast cell degranulates and histamine, etc. are released and triggers inflammation, smooth muscle contraction. If severe enough and system wide then asthma, respiratory insufficiency, laryngeal edema, loss of intravascular volume, hypoxia, shock and even death may occur. Of all the substances released, histamine is the most important. Histamine release results in increased vascular permeability, vasodilation, bronchospasm, and increased mucus production by goblet cells. See Figure 14.

Figure 14: Allergic conjunctivitis with conjunctival edema (left) and hyperemia (right)

TYPE 2 - CYTOTOXIC OR ANTIBODY DEPENDENT HYPERSENSITIVITY

In this category of Auto-Immune Diseases antibodies are formed which react with target antigens in human tissues which turn out to be either normal or altered cell membranes in the affected area. Target tissues for this type of disease include the eye, skin, joints and kidney especially but can cause damage in virtually any tissue of the body.

There are three different mechanisms involved in the Type 2 reaction:

1. Complement mediated cytotoxicity - here the antibody binds to the antigen component of the cell membrane and fixes complement, that in turn leads to lysis (total destruction) of the cell. Examples of this type of
disease are some of the hemolytic anemias, thrombocytopenia, and various immune mediated kidney diseases that are classified in the glomerulo-nephritis category.

2. Antibody dependent cell mediated cytotoxicity - here target cells are coated with antibody and this somehow directly leads to cell lysis. This is not clearly worked out and no specific examples will be given.

3. Antibody mediated cellular dysfunction - here antibodies attach to cell membrane surface receptors and interfere with cell function without damaging the cell itself. An example here is myasthenia gravis where the abnormal antibody attaches to the acetylcholine receptors in nerve ending and therefore inhibit or impair neuromuscular transmission. Therefore, in Myasthenia Gravis, there is a resultant severe muscle weakness due to the lack of neurologic receptor activity on the motor end plate. Another way this type of disease may be manifested is that the abnormal antibodies may result in stimulation of cells at the membrane receptor level and cause secretion by the cell. Graves disease, which is a common etiology of hyperthyroidism, is due to stimulation of the cells in the Thyroid Gland by this type of abnormal antibody.

NOTE: The optometrist must keep in mind that Type 2 and Type 3 Auto-Immune Diseases can affect virtually ANY tissue of the body but “prefers” to attack the Eye, Skin, Synovial Joints, and Kidney tissues!

NOTE: OFTEN A VIRUS OR A MEDICATION CAN BE THE ENVIRONMENTAL FACTOR LEADING TO THE CLINICAL MANIFESTATIONS OF THE ABOVE TYPE II AND TYPE III DISEASES. IN CASES WHERE COMPLEMENT IS ACTIVATED AND INVOLVED IT LEADS TO A PROCESS THAT DESTROYS THE INVOLVED TISSUES.

THE FOLLOWING ILLUSTRATIONS DEMONSTRATE THE IMMUNE-MEDIATED PROCESS FOR TISSUE DISTRUCTON WITH THESE DISEASES IN THE PRESENCE OF COMPLEMENT ACTIVATION.

A. Graves Disease -- thyroid disease most commonly leads to attention clinically either because of enlargement (goiter), or abnormal function (hyperthyroidism or hypothyroidism). A goiter simply means that there is enlargement of the thyroid gland but this enlargement may be observed to occur in hyperfunctioning or hypofunctioning of the thyroid gland. In the optometric practice, when a female patient has a goiter it is usually associated with the hyperthyroidism as a result of Graves Disease. The goiter that results in Graves Disease is due to the gland is being constantly bombarded by an autoimmune antibody, termed Thyroid Stimulating Immunoglobulin (TSI), which stimulates the gland by mimicking the hormone Thyroid Stimulating Hormone (TSH). Thus Graves Disease is the result of formation of an abnormal immune globulin and is a Type 2 Autoimmune Disease. In the presence of Graves Disease the patient’s TSH level is zero due to it being suppressed at the pituitary level via the feedback loop involving the
adrenal/hypothalamus/pituitary axis. Symptoms of Graves Disease include rapid resting pulse, heat intolerance, sweating, velvety skin, nervousness, tremor, increased appetite, weight loss, tiredness, weakness, diarrhea, etc. The eye signs of Graves Disease include the classic symptoms of hyperthyroidism including lid retraction, incomitant strabismus and exophthalmos (unilateral or bilateral). It is well documented that the most common underlying etiology of unilateral exophthalmos is NOT an orbital tumor, rather it is hyperthyroidism. Strabismus and ophthalmoplegia (weakness of the EOM's) generally follow as the muscles become fibrotic. All these ocular manifestation of hyperthyroidism can lead to exposure keratitis and exposure conjunctivitis. See Figure 15.

![Figure 15: Patient appearance and asymmetrical presentation of exophthalmos and inflammatory dry eye from Graves Disease](image)

Again, the ideal health care provider for treating and protecting the afflicted patient’s dry, exposed eyes is the optometrist. In Graves disease, dry eyes are due to both exposure and inflammation. A good topical treatment would be Restatsis (cyclosporine 0.05% ophthalmic emulsion). Thyroid-mediating medications like Tapazole are appropriate when the patient has clinical hyperthyroidism in order to remove the cause. When only thyroid antibodies are present, a consult with ophthalmology for orbital radiation or decompression surgery is sometimes needed.

B. **Myasthenia Gravis (MG)** -- occurs at least 3 times as often in young females than young males, and seems to have a predilection for patients of Chinese ancestry. Up to two thirds of patients initially present with diplopia or ptosis. Fluctuating, asymmetric external ophthalmoplegia with ptosis and weak eye closure is virtually diagnostic of ocular myasthenia.

Myasthenia Gravis is a polygenic disorder due to an abnormality on the genetic apparatus labeled as HLA B8. The disease results in impairment of function at the neuromuscular junctions and is characterized by relapses and remissions of skeletal muscle weakness and severe fatigability of the involved muscles. There are two peak ages of onset for Myasthenia Gravis, one onset occurs most commonly at about age 20 with Females/Male ratio 3/1 and at the other common age of onset is about age 50-60 with a slight male predominance. For this reason, diagnosis in older women is sometimes delayed. Both young and older patients age groups have at least a 75% chance of having Thymus gland abnormalities. See Figure 16.
The Thymus Gland abnormalities are different with the younger age group being most commonly hyperplasia of the thymus gland and the older age group being a benign tumor of the thymus gland. Pathology due to Myesthenia Gravis is from the affect of the immune globulin on the motor end plate at the neuro-muscular junction. These immune globulins may lead to defective neuromuscular transmission across the motor end plates of skeletal muscles and even destruction of these tissues.

Recall, contraction of muscle fibers is produced by interaction of ACH released from nerve endings and the resultant action at the ACH receptor sites on the motor end plates of the skeletal muscle. In myasthenia gravis there is a decrease in the ACH receptors and their activity due to an autoimmune problem. Specifically in Myesthenia Gravis, an IgG (Immune Globulin G) antibody is produced which impairs neuromuscular function but may result in destruction of the ACH receptor sites via complement activation. This is therefore a Type 2 (Cytotoxic) Autoimmune disease. It is antibody dependent as an antibody is formed against the ACH receptors and it may activate compliment and may or may not actually destroy the tissue but does interfere with function.

Clinically it is manifested by "spells" of fatigue of skeletal muscles and the most common sites are EOM's or lids first, the face second, and then tongue and extremities. It usually manifests as a ptosis or strabisums and can be seen even in pediatric patients. See Figure 17.
Figure 17: Myasthenia gravis presenting as unilateral ptosis in a pediatric patient (left) and as a left exotropia in an adult (right)

The classic MG test asked for on all examinations is the IV anticholinesterase drug physostigmine (neostigmine) with immediate but short-lived recovery. It also causes nausea and vomiting. A less-invasive test is the ice-on-eyes test, which should diminish the ptosis as ice temporarily reduces inflammation. Bloodwork will be positive for myasthenia antibodies in 70% of cases. Treatment is anticholinesterase drugs, at times thymic surgery, and even steroids and other immunosuppressive medications (azathioprine or cyclosporine). Optometrists should not forget to prescribe patching or prisms for diplopia. In acute cases, plasmapheresis or intravenous immunoglobulin, especially in myasthenic crisis.

TYPE 3 - IMMUNE COMPLEX MEDIATED DISEASE

In Immune Complex Disease, the problem is due to the formation of antigen/antibody complexes that initiate severe, acute inflammation in the involved tissues. The activation of complement is important in this particular sequence. Complement attracts polymorphonuclear leukocytes (PMN’s) and when PMN’s are attracted to an area they de-granulate (release their enzymes which are digestive in nature) and this leads to severe inflammation and tissue destruction at the involved site.

The combination of antigen/antibody complexes leads to the formation of a very large molecule and these large molecules tends to "lodge" in certain tissues of the body and a severe inflammatory response is triggered in these tissues. The severe inflammatory response often leads to tissue destruction. Tissues most often involved in this type of Immune Mediated Disease again are the eyes, the various synovial joints, the skin, and the kidneys. However, it is important to keep in mind that literally any tissue of the body can be involved but the above are the big four!

Examples of Type 3 diseases include Systemic Lupus Erythematosis, Rheumatoid Arthritis, Reiter and Sjogren Syndromes, and Scleroderma.

CLASSIC TYPE 3 DISEASES: AUTOIMMUNITY IN WOMEN
A. Systemic Lupus Erythematosus (SLE) - A Type 3 disease which leads to fever, multisystem inflammation (eye, skin, joints, and kidneys especially) and is characterized by "vasculitis." That is, the target tissue is nuclear components of the cells of small blood vessels. It is a female dominated disease, as for most autoimmune diseases, by a ratio of 10:1. The etiology is often unknown, but is suspected to be polygenic with environmental inflammatory triggers, including trauma, diet, infection, or chemical toxicity, including medications. See Figure 18.

![Figure 18: Classic butterfly-shaped facial rash in SLE (left) and systemic involvement (right) Source: http://en.wikipedia.org/wiki/Lupus](http://en.wikipedia.org/wiki/Lupus)

With ocular involvement in SLE examination of the eye may reveal hemorrhages and exudates due to the vasculitis involving the retinal circulation. In the eye you can see hemorrhages and exudates due to the vasculitis. Treatment is with systemic steroids. See Figure 19.
Figure 19: Butterfly facial rash in Lupus can be subtle. Notice reddening of the neck and the much more obvious retinal vasculitis

B. Rheumatoid Arthritis (RA) - Another Type 3 disease which affects 3:1 females over males. The target tissue is this disease is usually synovial tissue in joints of the hands, feet, knees, etc. but can also attack tissues in the eye, skin, kidney, heart, lungs, and other tissues. The immune complexes which develop in this disease lodge in the tissues listed above and activates complement which leads to severe inflammation in the involved tissues and resultant tissue destruction. Traditionally thought to be polygenic, RA is increasingly being shown to have environmental triggers, including inflammatory foods in the typical North American diet. Adults with RA do not have the associated iritis that occurs in Juvenile RA for some unknown reason. The scleritis and possible uveitis caused by RA is treated with anti-inflammatory medications, usually steroids. See Figure 20.

![Figure 20: Scleritis (right) seen in patient with obvious rheumatoid arthritis of the hands (left)](image)

C. Spondyloarthropathies (Reiter Syndrome) - In this category of disease the target tissue tends to be the spine, sacroiliac joints, feet and the eye. Affected people have a genetic predisposition so it is definitely a polygenic disease. The affected people usually are positive for a genetic marker labeled HLA-B27. The environmental trigger that activates this disease in genetically predisposed people is often an infection with chlamydia and various diarrhea causing enteric bacteria such as shigella or salmonella. There is very commonly an associated immune-mediated (not infectious) urethritis, conjunctivitis, and ANTERIOR UVEITIS along with the arthritis. The ocular symptoms are often the main reason the patient visits a doctor, especially an optometrist, which makes it important for the optometrist to consider this disease when examining a patient with unexplained conjunctivitis or anterior uveitis. This disease is slightly more common in males than females, making it unique among the various autoimmune diseases. However, clinicians should exhibit caution not to neglect the diagnosis in women. A rash on the soles of the feet known as keratoderma blennorrhagica can be pathognomonic. Treatment is usually systemic steroids. See Figure 21.
D. Sjogren Syndrome - This disease is characterized by dry eyes (keratoconjunctivitis sicca) and dry mouth (xerostomia) due to an immune-mediated destruction of the lacrimal and salivary glandular tissue. This disease is most commonly seen in direct association with another autoimmune disease, usually Rheumatoid Arthritis, in about 50-60% of cases. Therefore Sjogren Syndrome is classified as a Type 3 autoimmune disease. When Sjogren Syndrome occurs in isolation without any other associated autoimmune disease, it is important to inform the patient that they are very fortunate in that over half of patients with this disease have a crippling form of arthritis at the same time. Regardless of whether the disease is singular or coupled with another autoimmune disease, the dry eye must be cared for and the optometrist is the ideal health care practitioner for this task. A well-understood medication that can be used to treat Sjogren is Salagen, an oral form of pilocarpine with causes all mucous membranes in the body to increase secretion. See Figure 22.

E. Systemic Sclerosis (Scleroderma) - This disease is characterized by inflammation and fibrosis of various body tissues including the skin, kidneys,
intestines and various other organs of the body. This disease is somehow immune-mediated, but the actual mechanism is poorly understood by many physicians and therefore not discussed in this presentation. The main ocular manifestation is fibrosis and the resulting decreased elasticity of the skin of the eyelid and the skin in the area surrounding the eye. See Figure 23.

Figure 23: Scleroderma on the face (left) and hands (right). Note the similarity in appearance to SLE and RA, respectively.

In general, the incidence of all these various autoimmune diseases is much, much more common in females than males, often by a factor of at least a 10:1 ratio. In fact, when a female patient has multiple vague complaints of headache, aching all over, chronic upper shoulder and neck pain, skin rashes and simply complaining of being ill all the time, the optometrist and other medical practitioners should consider an autoimmune disease as the underlying etiology for any and all of these symptoms.

**TYPE 4 - DELAYED HYPERSENSITIVITY OR CELL MEDIATED HYPERSENSITIVITY**

A. This reaction is mediated by T Lymphocytes (CD4 T Lymphocytes).

B. The CD4 Cells release lymphokines in the involved tissue which leads to the severe inflammation.

A. The sequence of events in misdirected immunity is as follows: exposure to antigen in a genetically predisposed person leads to sensitization leading to a clone of T Lymphocytes (CD4), re-exposure leads to massing of the T Lymphocytes in the area within hours to days and a severe allergic reaction follows due to release of chemicals in the area. A prime example is poison ivy, cosmetic, or metal allergies.

Allergies are very, very common and the eye is virtually always involved. There is question as to whether women experience more Type 1 (anaphylactic) allergies than men do or whether it only appears to be true since a female patient is thought to be more likely to seek medical care than a male patient.
However, Type IV (delayed hypersensitivity) allergies due to exposure to cosmetics are much more common in women than men. Cosmetics are common allergens and usually result in Delayed Hypersensitivity (Type 4 Immune Reaction) which is similar to that for Poison Ivy or Poison Oak. Treatment is with topical or even oral antihistamines and mast cell stabilizers. See Figure 24.

![Figure 24: Eyelid hyperemia in type IV (delayed hypersensitivity) allergic conjunctivitis](image)

VI. CONGENITAL

Common problems in this category of diseases and disorders which occur much more commonly in females than in males include osteoporosis and iron-deficiency anemia.

1. **Osteoporosis** (see Figure 25)

![Figure 25: Healthy (left) vs. osteoporotic (right) bone, and typical hunched posture of a senior citizen with the disease in the spine](image)

Osteoporosis is a disorder that manifests clinically with thinning of the bones and a resultant dramatic increase in bone brittleness and dramatic increase in the risk of fracture with even minor trauma. The bone thinning and brittleness is due to calcium loss. Osteoporosis occurs more much, much more frequently in females than in males and is especially common after
menopause even when the Osteoporosis is fairly aggressively treated with hormone replacement, calcium supplements and with vigorous exercise programs. Weight-bearing exercise is preventative in younger patients. High-protein diets and foods (including dairy products!) tend to require calcium to buffer their excretion in the urine, and thus exacerbate osteoporosis. When supplements are needed, chelated calcium (ie calcium citrate) is much more effective than the low-quality calcium carbonate from oyster shell, etc.

2. Iron Deficiency Anemia (see Figure 26)

A large percentage of women, especially in the childbearing age, are anemic due to the chronic blood loss from menstruation depleting the body iron stores. Iron deficiency may also be due to dietary lack of iron and other causes of chronic blood loss such as daily aspirin use. Iron deficiency results in microcytic, hypochromic anemia (the cells are small and pale due to a lack of intracellular hemoglobin). It is estimated that a percentage up to 20% of the female population in this country are anemic due to inadequate iron intake and iron loss due to long-term blood loss during the menstrual cycles. Symptoms of iron deficiency anemia include fatigue, headache, lack of energy, paleness and even pagophagia (craving of ice). The reason for craving of ice is unknown but there is a variable association with mineral deficiency, including iron and zinc (the latter particularly in males).

Treatment of iron-deficiency anemia is best done by a certified dietician rather than the primary-care provider, as it is usually not iron consumption, but bioavailability that is at issue. Iron absorption can be increased by consuming more ascorbic acid (vitamin C) and lecithin, and fewer dairy and wheat-gluten products is known to increase bioavailability. When supplements are prescribed, high-quality chelated iron (eg iron picolinate) will avoid the gastrointestinal distress caused by supplementing with non-chelated iron. It will also improve patient compliance and happiness. Otherwise, optometrists can detect the bleeding caused by iron-deficiency anemia in conjunctival injection and even retinal hemorrhages. See Figure 26.
VII. METABOLIC

For illustration of this disease category, hypothyroidism and diabetes in pregnancy are discussed. Hyperthyroidism is most commonly due to Grave’s Disease which was discussed above in the Auto Immune Disease Category even though it clinically manifests as a metabolic disease due to over-activity of the thyroid gland.

1. Hypothyroidism (Hashimoto Thyroiditis)

Hypothyroidism is much more common in women than men. In cases of hypothyroidism there is an inadequate amount of thyroxin due either to a Pituitary Gland inadequate secretion of TSH or due to a primary thyroid gland failure problem. Symptoms of hypothyroidism are due to a metabolic slowing of all tissues of the body which result in the clinical manifestations, i.e., mental dullness, dry brittle hair, thickened dry skin (myxedema), constipation, hair loss especially the lateral half of the eyebrow, tiredness and weakness. It can also cause swelling of the neck known as goiter. See Figure 27.
The mental changes of hypothyroidism are similar to and often clinically misdiagnosed as Alzheimer’s Disease which is can be devastating for the patient as hypothyroidism is easily corrected with medications.

This author has had more than one patient misdiagnosed as Alzheimer’s Disease when the actual diagnosis was hypothyroidism. An example was a patient whose family called my office wanting the patient placed in a nursing home for terminal care. This person had never been seen in my office and had recently been moved into the home of a family I cared for over the past several years. I returned the call and was informed that “grandma” went into a coma and that her doctor, who was located in a different state, told the family she had Alzheimer’s Disease and when they could no longer take care of her to have her placed in a nursing home for terminal care. I had the patient transferred by ambulance to the Emergency Room at the hospital I used for admission of patients and went there to evaluate her for admission. History to me seemed inconsistent with Alzheimer’s Disease as it had a late and rather rapid onset inconsistent with that of Alzheimer’s. Therefore I ordered a CT Scan of the brain and a metabolic work-up that included blood sugar determination, thyroid function and testing for other metabolic diseases. The thyroid function testing came back as literally zero function and all the other tests were quite normal. I admitted her to the hospital and initiated treatment for a diagnosis of severe hypothyroidism. The patient regained consciousness over the next several hours and her mental function was absolutely normal for her age! She left the hospital and resumed a normal life whereas without hypothyroidism being considered as the etiology of her underlying coma, she would have certainly died in a nursing home with the inaccurate diagnosis of Alzheimer’s Disease.

2. Diabetes and Pregnancy –

All women who become pregnant should be screened for diabetes and checked regularly during their pregnancy for blood sugar levels. The reason for this is that the metabolic changes that occur with pregnancy often cause the activation of diabetes mellitus. This gestational diabetes may “go away” after the baby is born, but the patient (who is most often overweight) is at high risk for later in life developing diabetes mellitus especially Type 2. When a known diabetic becomes pregnant the patient is automatically considered a very high-risk patient and at risk for rapid development of the many complications of diabetes mellitus including kidney, retinal and vascular tissues! It is important to know that women who are not diabetic at the time they become pregnant but develop diabetes during pregnancy are also considered high-risk patients and later in life are at a much higher risk to develop overt diabetes so must have periodic laboratory evaluation and regular eye evaluations to look for evidence of diabetes. See Figure 28.
Figure 28: Neovascularization in long-standing diabetic retinopathy. This would be very unlikely to appear for the first time during pregnancy, rather, it would develop in a patient with undetected diabetes before pregnancy and become apparent upon dilated eye exam.

Note that “Glucola", or 50-100 mg glucose that pregnant women are routinely asked to drink during pregnancy to tease out gestational diabetes often causes nausea and vomiting. To avoid these side effects (and exposing the unborn child to intensely hypertonic Glucola), the patient can simply have blood glucose testing under fasting and non-fasting conditions. When gestational diabetes is present, the best treatment is, of course, to control the underlying disease.

VIII. IDIOPATHIC

There are many diseases and disorders that the underlying etiology is unknown and therefore they are placed in the category of Idiopathic which literally means of unknown etiology. Diseases and disorders in this category include but is not limited to aging, depression, hypertension, fibromyalgia, and multiple sclerosis.

1. Aging – Dermatochalasis

There are more "geriatric" female patients than men due to the fact that statistically women live significantly longer than men. In general women live approximately 5+ years longer than men and the female population in nursing homes is far greater than that for men. Over 600,000 cosmetic surgeries are performed in this country each year to help hide the effects of aging. These surgeries are for wrinkles, eyelid repair, baggy skin, etc. and the majority of the patients are women. Also, Botox injections are much more commonly administered to females than for males and again these injections are primarily for cosmetic reasons. Compare this to dermatochalasis, surgery for which is only covered by major medical insurance when the superior visual field is impaired by the ptosis. See Figure 29.
2. Depression –

Symptoms of depression occur more commonly in female patients than for male patients. The treatment of depression, especially with the use of tricyclic antidepressants, commonly have side-effects which results in symptoms of dry eyes and requires dry eye therapy. Optometrists, again, are the ideal practitioners for treating the dry eyes of patients on most types of antidepressant medications.

3. Hypertension –

A large number of patients have hypertension after the age 50. It is well documented that high blood pressure is more common in females than males. However, the adverse health effects of hypertension does more severe damage to the male patient than it does to female patients. It is well known that oral contraceptives increase the incidence of hypertension for female patients who take them thus making it important for the optometrist and other health care providers to perform more frequent measurements in order to adequately monitor the patient’s blood pressure levels. Female patients with documented hypertension who become pregnant are at much higher risk of complications during pregnancy for pre-eclampsia (severe hypertension and larger amounts of protein in the urine) and for the resulting complications to the health of both the mother and the fetus. The importance of regular dilated eye exams in the indirect detection of hypertension cannot be overstated. Treatment is for the underlying disease. See Figure 30.
4. Fibromyalgia –

Fibromyalgia is much, much more common in females than in males and is a medical syndrome that is very poorly understood. A common trigger is massive soft tissue insult (such as motor vehicle accidents), after which the immune system never "stands down from high alert."

Clinically fibromyalgia is often just as disabling and troublesome for symptoms as for some of the documented autoimmune diseases such as Rheumatoid Arthritis and Lupus Erythematosis. Fibromyalgia is clinically characterized by the presence of deep muscular pain (described as aching, throbbing, shooting or stabbing pain) which may occur all over the body. However, in virtually every case there are specific “trigger points” of severe tenderness on palpation. These tender or trigger points are much more common in the upper back (especially the upper trapezius), shoulders and neck muscles than any other anatomical location of muscles but also commonly occur in the sacroiliac area and at the inner aspect of the knees. See Figure 31.

Associated symptoms for cases of fibromyalgia include memory/cognitive impairment, severe fatigue (even the Chronic Fatigue Syndrome is often diagnosed), sleep disorder, chronic headache (tension-type or migraine), Temporomandibular Joint Syndrome (TMJ), and DRY EYES with accompanying symptoms of photophobia. These many and varied symptoms often “flare” at premenstrual times and is exacerbated with situations leading to stress, depression or anxiety states.
Therapy with tricyclic antidepressants often helps to relieve symptoms of fibromyalgia and helps to correct associated sleep disturbances and depression. Therapy with cortisone trigger point injections and trigger point therapy by acupuncture, physical therapy, relaxation/biofeedback programs, manipulative therapy by chiropractors and other professional, massage therapy and limited exercise programs have all been found helpful in certain cases. However, the condition is usually chronic with symptoms waxing and waning over the course of many years. Because inflammatory foods in the diet may well play a significant role in this and other autoimmune diseases, consultation with a licensed dietician or naturopathic physician is warranted.

5. Multiple Sclerosis –

Multiple Sclerosis occurs much more commonly in females than males and is quite often seen in the optometric practice. Multiple sclerosis is characterized by unpredictable patches of demyelination throughout the CNS which form and heal in recurrent episodes. These episodes may even seem to go away for months or years even when the disease can be documented to be present by CT Scans, etc. diagnostic methods. See Figure 32.

![Figure 32: T1-weighted MRI scans, post-contrast (left) in an MS patient. Bright spots indicate active lesions. Demyelinated white matter seen on autopsy.](image)

Multiple sclerosis usually manifests clinically as a relapsing and remitting disorder of neurologic dysfunction in the involved neuronal tracks. The disease is increasingly considered to be autoimmune. It acts as an inflammatory disease in that excessive heat certain viral diseases such as measles have been implicated as the trigger which activates the onset – or flareups -- of the disease. The correlation of the incidence of MS in patients who spend their early years at northern latitudes has led many researchers to investigate vitamin D levels in the blood in MS patients. Vitamin D is a steroid hormone that regulates inflammation and deficiency is epidemic because of increased use of sunblock and decreased hours spent outdoors.

A favorite location for multiple sclerosis to manifest clinically is involvement of the optic nerve and brain stem. Therefore, eye signs are quite common, such as the onset of color desaturation, diplopia and the development of scotomas. Diplopia is often only in secondary (left and/or right gaze). Frequently, one eye will not adduct, while the other will show an abduction nystagmus. Convergence will often (but not always!) remain intact. This is called internuclear ophthalmoplegia, which is most frequently due to MS causing
demyelination in the medial longitudinal fasiculus (MLF) in a young patient. This highly-diagnostic clinical sign is a topic that will be covered in greater detail in a future online continuing education course from Pacific University. See Figure 33.

Figure 33: Systemic symptoms, shown here in the much less common male MS patient (left). Also shown, eye movements in internuclear ophthalmoplegia (INO) of the right eye due to demyelination of the right medial longitudinal fasiculus (MLF).

Source: http://en.wikipedia.org/wiki/Multiple_sclerosis_signs_and_symptoms

Other symptoms of MS include muscle weakness, paresthesias scattered over the body, and virtually any recurring neurologic symptom. Patients are usually are quite normal between attacks, however, the disease may rarely, thankfully, be a very severe disease onset with a rapid downhill clinical course and even result in the death of the patient.

THIS CONCLUDES THE COURSE:

WOMEN’S HEALTH ISSUES IN OPTOMETRIC PRACTICE