FY 2020 Houston EMA Ryan White Part A/MAI Service Definition **Vision Care**	
HRSA Service Category Title: **RWGA Only**	**Ambulatory/Outpatient Medical Care**
Local Service Category Title:	**Vision Care**
Budget Type: **RWGA Only**	**Fee for Service**
Budget Requirements or Restrictions: **RWGA Only**	Corrective lenses are not allowable under this category. Corrective lenses may be provided under Health Insurance Assistance and/or Emergency Financial Assistance as applicable/available.
HRSA Service Category Definition: **RWGA Only**	***Outpatient/Ambulatory medical care*** is the provision of professional diagnostic and therapeutic services rendered by a physician, physician's assistant, clinical nurse specialist, or nurse practitioner in an outpatient setting. Settings include clinics, medical offices, and mobile vans where clients generally do not stay overnight. Emergency room services are not outpatient settings. Services includes diagnostic testing, early intervention and risk assessment, preventive care and screening, practitioner examination, medical history taking, diagnosis and treatment of common physical and mental conditions, prescribing and managing medication therapy, education and counseling on health issues, well-baby care, continuing care and management of chronic conditions, and referral to and provision of specialty care (includes all medical subspecialties). *Primary medical care* for the treatment of HIV infection includes the provision of care that is consistent with the Public Health Service's guidelines. Such care must include access to antiretroviral and other drug therapies, including prophylaxis and treatment of opportunistic infections and combination antiretroviral therapies. HRSA policy notice 10-02 states funds awarded under Part A or Part B of the Ryan White CARE Act (Program) may be used for optometric or ophthalmic services under Primary Medical Care. Funds may also be used to purchase corrective lenses for conditions related to HIV infection, through either the Health Insurance Premium Assistance or Emergency Financial Assistance service categories as applicable.
Local Service Category Definition:	**Primary Care Office/Clinic Vision Care** is defined as a comprehensive examination by a qualified Optometrist or Ophthalmologist, including Eligibility Screening as necessary. A visit with a credentialed Ophthalmic Medical Assistant for any of the following is an allowable visit: • Routine and preliminary tests including Cover tests, Ishihara Color Test, NPC (Near Point of Conversion), Vision Acuity Testing, Lensometry. • Visual field testing • Glasses dispensing including fittings of glasses, visual acuity testing, measurement, segment height. • Fitting of contact lenses is not an allowable follow-up visit.

Target Population (age, gender, geographic, race, ethnicity, etc.):	HIV-infected individuals residing in the Houston EMA/HSDA.
Services to be Provided:	Services must be provided at an eye care clinic or Optometrist's office. Services must include but are not limited to external/internal eye health evaluations; refractions; dilation of the pupils; glaucoma and cataract evaluations; CMV screenings; prescriptions for eyeglasses and over the counter medications; provision of eyeglasses (contact lenses are not allowable); and referrals to other service providers (i.e. Primary Care Physicians, Ophthalmologists, etc.) for treatment of CMV, glaucoma, cataracts, etc. Agency must provide a written plan for ensuring that collaboration occurs with other providers (Primary Care Physicians, Ophthalmologists, etc.) to ensure that patients receive appropriate treatment for CMV, glaucoma, cataracts, etc.
Service Unit Definition(s): **RWGA Only**	One (1) unit of service = One (1) patient visit to the Optometrist, Ophthalmologist or Ophthalmic Assistant.
Financial Eligibility:	Refer to the RWPC's approved *Financial Eligibility for Houston EMA/HSDA Services.*
Client Eligibility:	HIV-infected resident of the Houston EMA/HSDA.
Agency Requirements:	Providers and system must be Medicaid/Medicare certified to ensure that Ryan White Program funds are the payer of last resort to the extent examinations and eyewear are covered by the State Medicaid program.
Staff Requirements:	Vendor must have on staff a Doctorate of Optometry licensed by the Texas Optometry Board as a Therapeutic Optometrist.
Special Requirements: **RWGA Only**	Vision care services must meet or exceed current U.S. Dept. of Health and Human Services (HHS) guidelines for the treatment and management of HIV disease as applicable to vision care.

FY 2022 RWPC "How to Best Meet the Need" Decision Process

Step in Process: **Council**		Date: **06/10/2021**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Steering Committee**		Date: **06/03/2021**
Recommendations:	Approved: Y:_____ No: _____ Approved With Changes:_____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **Quality Improvement Committee**		Date: **05/18/2021**
Recommendations:	Approved: Y:_ ___ No: _____ Approved With Changes: _____	If approved with changes list changes below:
1.		
2.		
3.		

Step in Process: **HTBMTN Workgroup #1**	Date: **04/20/2021**
Recommendations:	Financial Eligibility:
1.	
2.	
3.	

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FY 2019 PERFORMANCE MEASURES HIGHLIGHTS
RYAN WHITE GRANT ADMINISTRATION
HARRIS COUNTY PUBLIC HEALTH (HCPH)

TABLE OF CONTENTS

HCPH is the local public health agency for the Harris County, Texas jurisdiction. It provides a wide variety of public health activities and services aimed at improving the health and well-being of the Harris County community.

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Highlights from FY 2019 Performance Measures

Measures in this report are based on the 2019/2020 Houston Ryan White Quality Management Plan, Appendix B. HIV Performance Measures.

Vision Care

- During FY 2019, 871 clients were diagnosed with HIV/AIDS related and general ocular disorders. Among 130 clients with follow-up appointments, 6% of clients had disorders that were either resolved or improved, while 90% of clients had disorders that remained the same.

Ryan White Part A
HIV Performance Measures
FY 2019 Report

Vision Care
All Providers

HIV Performance Measures	FY 2019
75% of clients with diagnosed HIV/AIDS related and general ocular disorders will resolve, improve or stay the same over time	See ocular disorder table

Clinical Chart Review Measures*	FY 2017	FY 2018
100% of vision clients will have a medical health history (initial or updated) at least once in the measurement year	99%	100%
100% of vision clients will have a vision history (initial or updated) at least once in the measurement year	99%	100%
100% of vision clients will have a comprehensive eye exam at least once in the measurement year	100%	100%

* To review the full FY 2018 chart review reports, please visit:
http://publichealth.harriscountytx.gov/Services-Programs/Programs/RyanWhite/Quality

Ocular Disorder	Number of Diagnoses	Number with Follow-up	*Improved		*Resolved		*Same		*Worsened	
			#	%	#	%	#	%	#	%
Accommodation Spasm										
Acute Retinal Necrosis										
Anisocoria	1	0								
Bacterial Retinitis										
Cataract	130	19	1	5.3%			17	89.5%	1	5.3%
Chalazion	5	0								
Chorioretinal Scar	8	0								
Chorioretinitis										
CMV Retinitis - Active										
CMV Retinitis - Inactive										
Conjunctivitis	25	4	1	25.0%	2	50.0%	1	25.0%		
Covergence Excess										
Convergence Insufficiency										
Corneal Edema	1	0								
Corneal Erosion										
Corneal Foreign Body										
Corneal Opacity	35	5					5	100%		
Corneal Ulcer	2	1			1	100%				
Cotton Wool Spots										
Diabetic Retinopathy	5	1	1	100%						
Dry Eye Syndrome	326	55					55	100%		
Ecchymosis										
Esotropia	2	2					2	100%		
Exotropia	6	4					4	100%		
Glaucoma	5	1					1	100%		
Glaucoma Suspect	53	9					7	77.8%	2	22.2%
Iritis	1	0								
Kaposi Sarcoma	1	0								
Keratitis	12	2			2	100%				
Keratoconjuctivitis	1	0								
Keratoconus	3	0								
Lagophthalmos										
Macular Hole										
Meibomianitis	1	0								
Molluscum Contagiosum										
Optic Atrophy	4	1							1	100%
Papilledema										

Ocular Disorder	Number of Diagnoses	Number with Follow-up	*Improved		*Resolved		*Same		*Worsened	
			#	%	#	%	#	%	#	%
Paresis of Accommodation										
Pseudophakia	10	1					1	100%		
Refractive Change/Transient										
Retinal Detachment	1	0								
Retinal Hemorrhage										
Retinal Hole/Tear	2	0								
Retinopathy HTN	3	0								
Suspicious Optic Nervehead(s)	1	0								
Toxoplasma Retinochoriochitis										
Thyroid Eye Disease										
Visual Field Defect	9	3					3	100%		
Vitreous Degeneration	6	1					1	100%		
Other	212	21					20	95.2%	1	4.8%
Total	**871**	**130**	**3**	**2.3%**	**5**	**3.8%**	**117**	**90.0%**	**5**	**3.8%**

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Vision Care Chart Review Report FY 2019

Ryan White Part A Quality Management Program–Houston EMA

November 2020

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HCPH is the local public health agency for the Harris County, Texas jurisdiction. It provides a wide variety of public health activities and services aimed at improving the health and well-being of the Harris County community.

Introduction

Part A funds of the Ryan White Care Act are administered in the Houston Eligible Metropolitan Area (EMA) by the Ryan White Grant Administration of Harris County Public Health. During FY 19, a comprehensive review of client vision records was conducted for services provided between 3/1/19 to 2/29/20.

The primary purpose of this annual review process is to assess Part A vision care provided to people living with HIV in the Houston EMA. Unlike primary care, there are no federal guidelines published by the U.S Department of Health and Human Services for general vision care targeting people living with HIV. Therefore, Ryan White Grant Administration has adopted general guidelines published by the American Optometric Association, as well as internal standards determined by the clinic, to measure the quality of Part A funded vision care. The Ryan White Grant Administration Project Coordinator for Clinical Quality Improvement (PC/CQI) performed the chart review.

Scope of This Report

This report provides background on the project, supplemental information on the design of the data collection tool, and presents the pertinent findings of the FY 19 vision care chart review. Also, any additional data analysis of items or information not included in this report can likely be provided after a request is submitted to Ryan White Grant Administration.

The Data Collection Tool

The data collection tool employed in the review was developed through a period of in-depth research conducted by the Ryan White Grant Administration. By researching the most recent vision practice guidelines, a listing of potential data collection items was developed. Further research provided for the editing of this list to yield what is believed to represent the most pertinent data elements for vision care in the Houston EMA. Topics covered by the data collection tool include, but are not limited to the following: completeness of the Client Intake Form (CIF), CD4 and VL measures, eye exams, and prescriptions for lenses. See Appendix A for a copy of the tool.

The Chart Review Process

All charts were reviewed by the PC/CQI, a Master's-level registered nurse experienced in identifying documentation issues and assessing adherence to published guidelines. The collected data for each site was recorded directly into a preformatted database. Once all data collection was completed, the database was queried for analysis. The data collected during this process is intended to be used for the purpose of service improvement.

The specific parameters established for the data collection process were developed from vision care guidelines and the professional experience of the reviewer on standard record documentation practices. Table 1 summarizes the various documentation criteria employed during the review.

Table 1. Data Collection Parameters	
Review Area	**Documentation Criteria**
Laboratory Tests	Current CD4 and Viral Load Measures
Client Intake Form (CIF)	Completeness of the CIF: includes but not limited to documentation of primary care provider, medication allergies, medical history, ocular history, and current medications
Complete Eye Exam (CEE)	Documentation of annual eye exam; completeness of eye exam form; comprehensiveness of eye exam (visual acuity, refraction test, binocular vision assessment, fundus/retina exam, and glaucoma test)
Ophthalmology Consult (DFE)	Performed/Not performed
Lens Prescriptions	Documentation of the Plan of Care (POC) and completeness of the dispensing form

The Sample Selection Process

The sample population was selected from a pool of 2,546 unduplicated clients who accessed Part A vision care between 3/1/19 and 2/29/20. The medical charts of 150 of these clients were used in the review, representing 5.9% of the pool of unduplicated clients.

In an effort to make the sample population as representative of the actual Part A vision care population as possible, the EMA's Centralized Patient Care Data Management System (CPCDMS) was used to generate the lists of client codes. The demographic make-up (race/ethnicity, gender, age) of clients accessing vision care services between 3/1/19 and 2/29/20 was determined by CPCDMS, which in turn allowed Ryan White Grant Administration to generate a sample of specified size that closely mirrors that same demographic make-up.

Characteristics of the Sample Population

The review sample population was generally comparable to the Part A population receiving vision care in terms of race/ethnicity, gender, and age. It is important to note that the chart review findings in this report apply only to those who receive vision care from a Part A provider and cannot be generalized to all Ryan White clients or to the broader population of people with HIV or AIDS. Table 2 compares the review sample population with the Ryan White Part A vision care population as a whole.

Table 2. Demographic Characteristics of FY 19 Houston EMA Ryan White Part A Vision Care Clients				
	Sample		**Ryan White Part A EMA**	
Race/Ethnicity	Number	Percent	Number	Percent
African American	72	48%	1,265	50%
White	73	49%	1,201	47%
Asian	3	2%	40	2%
Native Hawaiian/Pacific Islander	0	0%	5	<1%
American Indian/Alaska Native	0	0%	11	<1%
Multi-Race	1	<1%	24	<1%
TOTAL	**150**		**2,546**	
Hispanic Status				
Hispanic	53	35%	918	36%
Non-Hispanic	97	65%	1,628	64%
TOTAL	**150**		**2,546**	
Gender				
Male	113	75%	1,869	73%
Female	34	23%	642	25%
Transgender Male to Female	3	2%	34	1%
Transgender Female to Male	0	0%	1	<1%
TOTAL	**150**		**2,546**	
Age				
<= 24	3	2%	94	4%
25 – 34	36	24%	585	23%
35 – 44	34	23%	641	25%
45 – 49	18	12%	326	13%
50 – 64	53	35%	805	32%
65+	5	3%	95	4%
TOTAL	**150**		**2,546**	

Findings

Laboratory Tests

Having up-to-date lab measurements for CD4 and viral load (VL) levels enhances the ability of vision providers to ensure that the care provided is appropriate for each patient. CD4 and VL measures indicate stage of disease, so in cases where individuals are in the late stage of HIV disease, special considerations may be required.

Patient chart records should provide documentation of the most recent CD4 and VL information. Ideally this information should be updated in coordination with an annual complete eye exam.

	2017	2018	2019
CD4	80%	83%	94%
VL	80%	83%	94%

Client Intake Form (CIF)

A complete and thorough assessment of a patient's health history is essential when caring for individuals living with HIV or anyone who is medically compromised. The agency assesses this information by having patients complete the CIF. Information provided on the CIF, such as ocular history or medical history, guides clinic providers in determining the appropriateness of diagnostic procedures, prescriptions, and treatments. The CIF that is used by the agency to assess patient's health history captures a wide range of information; however, for the purposes of this review, this report will highlight findings for only some of the data collected on the form.

Below are highlights of the findings measuring completeness of the CIF.

	2017	2018	2019
Primary Care Provider	81%	87%	97%
Medication Allergies	99%	100%	100%
Medical History	99%	100%	99%
Current Medications	99%	100%	100%
Reason for Visit	100%	100%	100%
Ocular History	99%	100%	100%

Eye Examinations (Including CEE/DFE) and Exam Findings

Complete and thorough examination of the eye performed on a routine basis is essential for the prevention, detection, and treatment of eye and vision disorders. When providing care to people living with HIV, routine eye exams become even more important because there are a number of ocular manifestations of HIV disease, such as CMV retinitis.

CMV retinitis is usually diagnosed based on characteristic retinal changes observed through a DFE. Current standards of care recommend yearly DFE performed by an ophthalmologist for clients with CD4 counts <50 cells/mm3 (2). No clients in this sample had CD4 counts <50 cells/mm3.

	2017	2018	2019
Complete Eye Exam	100%	100%	100%
Dilated Fundus Exam	98%	94%	95%
Internal Eye Exam	100%	100%	100%
Documentation of Diagnosis	100%	100%	100%
Documentation of Treatment Plan	100%	100%	100%
Visual Acuity	100%	100%	100%
Refraction Test	100%	100%	100%
Observation of External Structures	100%	100%	100%
Glaucoma Test	100%	100%	100%
Cytomegalovirus (CMV) screening	98%	94%	95%

Ocular Disease

Twelve clients (8%) demonstrated ocular disease, including keratitis, stye, keratoconus, iridocyclitis, optic atrophy, pinguecula, blepharitis, and conjunctivitis. Nine clients received treatment for ocular disease, two clients were referred to a specialty eye clinic, and one client did not need treatment at the time of visit.

Prescriptions

Of records reviewed, 97% (95%-FY18) documented new prescriptions for lenses at the agency within the year.

Conclusions

Findings from the FY 19 Vision Care Chart Review indicate that the vision care providers perform comprehensive vision examinations for the prevention, detection, and treatment of eye and vision disorders. Performance rates are very high overall, and are consistent with quality vision care.

Appendix A—FY 19-Vision Chart Review Data Collection Tool

Mar 1, 19 to Feb 29, 20

Pt. ID # _____ Site Code:_____

CLIENT INTAKE FORM (CIF)

1. PRIMARY CARE PROVIDER documented: Y - Yes N - No
2. MEDICATION ALLERGIES documented: Y - Yes N - No
3. MEDICAL HISTORY documented: Y - Yes N - No
4. CURRENT MEDS are listed: Y - Yes N - No
5. REASON for TODAY's VISIT is documented: Y - Yes N - No
6. OCULAR HISTORY is documented: Y - Yes N - No

CD4 & VL

7. Most recently documented CD4 count is within past 12 months: Y - Yes N - No
8. CD4 count is < 50: Y - Yes N - No
9. Most recently documented VL count is within past 12 months: Y - Yes N – No

EYE CARE:

10. COMPLETE EYE EXAM (CEE) performed: Y - Yes N - No
11. Eye Exam included ASSESSMENT OF VISUAL ACUITY: Y - Yes N - No
12. Eye Exam included REFRACTION TEST: Y - Yes N - No
13. Eye Exam included OBSERVATION OF EXTERNAL STRUCTURES: Y - Yes N - No
14. Eye Exam included GLAUCOMA TEST (IOP): Y - Yes N - No
15. Internal Eye Exam findings are documented: Y - Yes N - No
16. Dilated Fundus Exam (DFE) done within year: Y - Yes N - No
17. Eye Exam included CYTOMEGALOVIRUS (CMV) SCREENING: Y - Yes N – No
18. New prescription lenses were prescribed: Y - Yes N - No
19. Eye Exam written diagnoses are documented: Y - Yes N - No
20. Eye Exam written treatment plan is documented: Y - Yes N - No
21. Ocular disease identified? Y - Yes N – No
22. Ocular disease treated appropriately? Y - Yes N - No
23. Total # of visits to eye clinic within year:_____

Appendix B – Resources

1. Casser, L., Carmiencke, K.., Goss, D.A., Knieb, B.A., Morrow, D., & Musick, J.E. (2005). Optometric Clinical Practice Guideline—Comprehensive Adult Eye and Vision Examination. *American Optometric Association*. Retrieved from http://www.aoa.org/Documents/CPG-1.pdf on April 15, 2012.

2. Heiden D., Ford N., Wilson D., Rodriguez W.R., Margolis T., et al. (2007). Cytomegalovirus Retinitis: The Neglected Disease of the AIDS Pandemic. *PLoS Med* 4(12): e334. Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2100142/ on April 15, 2012.

3. International Council of Ophthalmology. (2011). *ICO International Clinical Guideline, Ocular HIV/AIDS Related Diseases.* Retrieved from http://www.icoph.org/resources/88/ICO-International-Clinical-Guideline-Ocular-HIVAIDS-Related-Diseases-.html on December 15, 2012.

4. Panel on Opportunistic Infections in Adults and Adolescents with HIV. Guidelines for the prevention and treatment of opportunistic infections in adults and adolescents with HIV: recommendations from the Centers for Disease Control and Prevention, the National Institutes of Health, and the HIV Medicine Association of the Infectious Diseases Society of America. Available at http://aidsinfo.nih.gov/contentfiles/lvguidelines/adult_oi.pdf. Accessed February 1, 2019.

VersantHealth®
(https://versanthealth.com)

Americans Show New Interest in Virtual Eye Care Options, Finds Second Annual Vision Wellness Study

Young adults, in particular, are more likely to seek out and place high value on telemedicine for eye care

Baltimore, Maryland, February 11, 2021 – Today, **Versant Health (https://versanthealth.com/)**, released the results of the **2nd annual Vision Wellness Study (https://bit.ly/3rJPTR6)**, which found Americans, in particular young adults under 40, are showing a new interest in the use of virtual technology and telemedicine for eye care.

The **Vision Wellness Study (https://bit.ly/3rJPTR6)** surveyed consumers and health plan executives on their perceptions of eye care in a pandemic environment, including the value they place on eye care services and their beliefs about the impact of eye care on overall health.

Almost three quarters (74%) of respondents under 40 say having access to technology and tools for virtual visits would make them more likely to schedule a routine eye exam, compared to 67% of all respondents. More than one third (38%) of people under 40 say that being able to communicate remotely with eye doctors would have a high impact on seeing an eye doctor more often, compared to 34% of people ages 40-59 and just 15% of people ages 60 and over. Health plan executives also see the value of telemedicine—76% of those surveyed believe members' use of alternatives to face-to-face contact with eye doctors will increase substantially or somewhat as a result of the pandemic.

"With COVID-19 as the backdrop, patients are showing an increased desire for convenient and easily-accessible eye care using remote technology," said Dr. Mark Ruchman, Chief Medical Officer at Versant Health. "As we look to the future of eye care, ocular telemedicine will play an important role in improving access to care, as patients are provided more ways to address their eye health on their own terms."

Perceptions of Eye Care Value vs. Costs

Overall, Americans are increasingly recognizing the importance of eye care, with 81% of respondents receiving an eye exam in the past two years, compared to 77% who said the same in the inaugural study. For all respondents, including those who have not seen an eye doctor in the past two years, the ability to identify eye diseases and the ability to identify other serious health conditions, such as diabetes, ranked as the top two services that would make them more likely to schedule an eye doctor appointment, supporting the role of eye health as a window into overall health.

Of people who have not received an eye exam in the past two years, 37% say it's due to cost and affordability, pointing to a need to dispel misconceptions about the costs of eye care.

"Members are realizing that comprehensive eye exams can provide a clearer picture of their overall health," said Elizabeth Klunk, RN, BSN, CCM-R, Senior Vice President of Medical Management at Versant Health. "In fact, eye exams are one of the lowest cost and least invasive methods at looking at whole body health for early disease detection."

The Social Determinants of Eye Health

Despite the low cost of eye care, barriers to access persist, particularly for people in lower income households—81% of all respondents say they have received an eye exam in the past two years, but only 68% of people in households with incomes under $35,000 say the same. When it comes to insurance, 69% of respondents say someone in their household has vision insurance, and that drops to 61% for people with incomes under $35,000.

While 43% of people with incomes under $35,000 say affordability is the reason why they don't go to the eye doctor as often as they'd like, health plan executives say transportation is the key obstacle for members' access to eye care services (88%), highlighting a disconnect. Where health plan executives are concerned about physically getting members to eye doctors' offices, members are more concerned with the costs of care.

"The future of eye care requires us to implement tools that can increase access to care for all patient populations, especially those who are more likely to face systemic barriers. During this pandemic, the rapid advancement of technology has helped us to better meet the needs of vulnerable populations, and we are committed to continuing to explore how it makes healthy sight more accessible," said Klunk.

Methodology

Versant Health's 2nd annual Vision Wellness Study, conducted between October 30 and November 17, 2020, included two distinct surveys fielded by Market Measurement, a custom market research firm. The consumer survey comprises 525 responses from consumers 18 and older. The healthcare plan executive survey comprised 17 responses from health plan executives across the U.S. The survey covered their opinions on routine eye care, access to eye exams, preventative health measures, care costs and other topics related to managed vision care.

About Versant Health

Versant Health is one of the nation's leading managed vision care companies serving more than 36 million members nationwide. Through our Davis Vision plans and Superior Vision plans, we help members enjoy the wonders of sight through healthy eyes and vision. Providing vision and eye health solutions that range from routine vision benefits to medical management, Versant Health has a unique visibility and scale across the total eye health value chain. As a result, members enjoy a seamless experience with access to one of the broadest provider networks in the industry and an exclusive frame collection. Commercial groups, individuals, third parties, and health plans that serve government-sponsored programs such as Medicaid and Medicare are among our valued customers.

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verywell health

HIV-Associated Complications of the Eye

By James Myhre and Dennis Sifris, MD | Medically reviewed by a board-certified physician | Updated on December 05, 2019

HIV-associated eye disorders are common among people living with HIV, with between 70 and 80% experiencing some form of eye problem during the course of their disease. While many of these disorders are associated with later-stage infection—when a person's CD4 count drops below 250 cells/mL (and even more so below 100 cells/mL)—they can, in fact, occur at stage of infection.

Among the eye-related disorders associated with HIV:

- Below 500 cells: herpes zoster (shingles); Kaposi sarcoma (KS), lymphoma, tuberculosis (TB)
- Below 200 cells: herpes simplex virus (HSV), pneumocystosis, toxoplasmosis
- Below 100 cells: aspergillosis, cytomegalovirus (CMV), cryptococcosis, HIV encephalopathy, microsporidiosis, molluscum contagiosum (MC), mycobacterium avium complex (MAC), progressive multifocal encephalopathy (PML), varicella-zoster virus (VZV)

While HIV-associated eye disorders are more often caused by these and other opportunistic infections (OIs), they may also be a direct result of the HIV infection itself, manifesting with changes—sometimes minor, sometimes profound—to the nerve and vascular structure of the eye itself.

Since the advent of combination antiretroviral therapy (ART), the incidence of many of these infections has dropped dramatically, although they remain high in regions where access to therapy remains sparse and/or control of disease is poor.

Identifying the cause of an HIV-associated eye disorder typically begins by determining where the infection is presenting.

Infections of the Eyelid, Tear Ducts, and Conjunctiva

Known as the *ocular adnexa*, this section of the ocular anatomy provides protection and lubrication to the eye itself and includes the eyelid, tear ducts, and conjunctiva (white of the eyes). The most common infections to present within these areas are herpes zoster virus (HSV), Kaposi sarcoma (KS), and molluscum contagiosum (also known as "water warts"). Microvascular changes—dilation of veins and arteries, micro-aneurisms—are also known to occur in about 70 to 80% of people with HIV, and may be directly related to the HIV infection itself

Infections of the ocular adnexa may present with painful shingles running along the ophthalmic nerve to the eye; dark purplish tumors on and around the eyelid; or pox-like bumps affecting one or both the eyelids.

Infections on the Front of the Eye (Cornea, Iris, and Lens)

The anterior (front) segment of the eye functions primarily by refracting light and adjusting focus needed for vision, and includes the cornea, iris, lens, and anterior chamber (the fluid-filled space between the cornea and iris). Some of the more common infections of the anterior segment are varicella-zoster virus (the virus associated with chickenpox and shingles); microsporidiosis (a protozoan infection); herpes simplex (the virus associated with cold sores and genital herpes); and other opportunistic fungal or bacterial infections.

Many of these infections tend occur in later-stage disease when an HIV-positive person's immune system is effectively compromised. Keratitis, a sometimes painful and itchy inflammation of the cornea, is one of the frequent symptoms note in anterior segment infections, whether caused by varicella-zoster virus, herpes simplex, or fungal infection like *Candida* or *Aspergillus.*

Infections to the Back of the Eye (Retina and Optic Nerve)

The posterior (back) segment of the eye functions by maintaining the shape of the eyeball, holding the lens in place, and triggering nerve impulses to the brain from photoreceptor cells on the back of the eyes. The retina, choroid (the vascular layer of the eye), and optic nerve comprise much of the posterior segment, with a number of HIV-associated disorders presenting within these ocular layers, more often in later stage HIV disease.

Disorders of the posterior segment—primarily presenting with vascular changes to the retina—are seen in as many as 50% to 70% of people with HIV, and may sometime result in persistent or acute damage to the retina (called retinopathy).

Other HIV-associated infections of the posterior segment are cytomegalovirus (one of the most common ocular infections among people with HIV); tuberculosis (TB); toxoplasmosis (a common and easily transmitted parasitic infection); and cryptococcosis (another common HIV-related fungal infection).

Infections of the Eye Socket

While there are few HIV-associated infections of the orbital segment of the eye (also known as the eye socket), aspergillosis—a fungal infection that typically occurs in persons with advanced HIV disease—is known to cause the inflammation of the orbital eye tissue (cellulitis) in some. Similarly, lymphomas (blood cell tumors) may present within this segment, again usually when the individual's CD4 has dropped below 100 cells/mL.

Article Sources

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