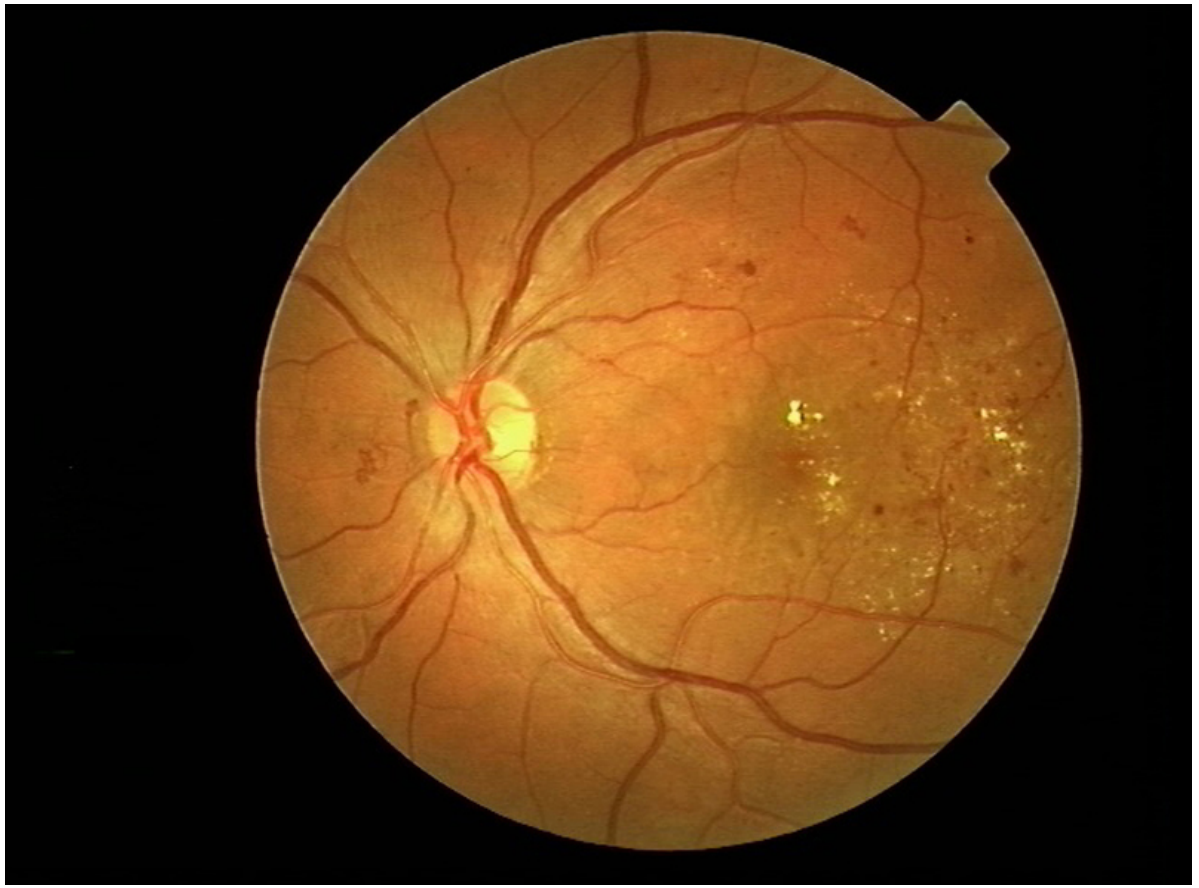
Diabetic Retinopathy Don’t Lose Sight

Advancements in Diabetes Webinar

29 October 2020



Diabetes Mellitus
U.S. Prevalence
National Diabetes Statics Report 2020

Total:

- 34.2 M Americans with DM (10.5% of the US population)
- 26.9 M diagnosed 7.3 M undiagnosed

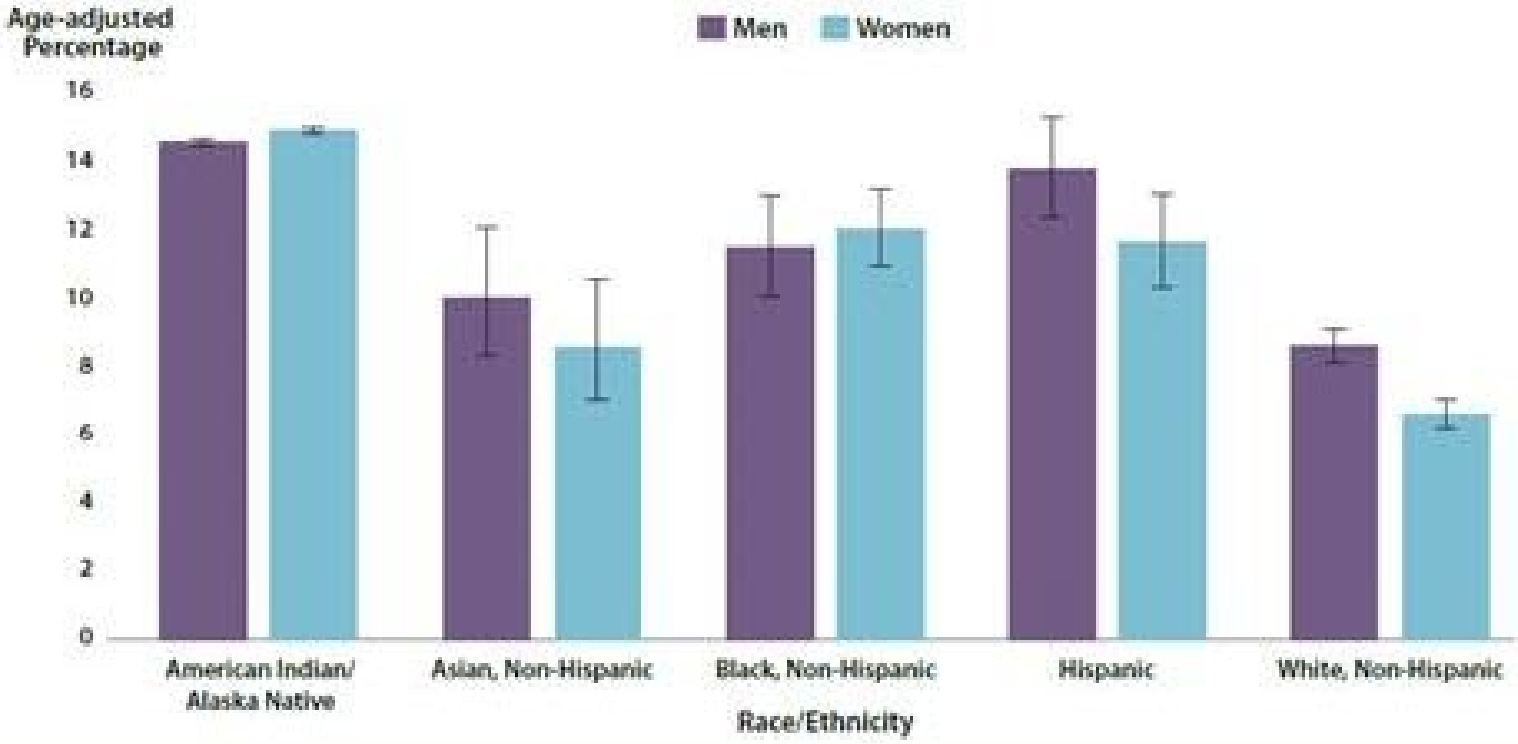
- 88 M American with pre-DM (18-year-old + 34.5% of the U.S. population)

CDC National Diabetes Statistics Report, 2020

Figure 2. Age-adjusted estimated prevalence of diagnosed diabetes by race/ethnicity group and sex for adults aged 18 years or older, United States, 2017–2018

Note: Error bars represent upper and lower bounds of the 95% confidence interval.

Data sources: 2017–2018 National Health Interview Survey; 2017 Indian Health Service National Data Warehouse (for American Indian/ Alaska Native group only).



Diabetic Retinopathy
Epidemiology

- ~40% prevalence of DR among all DM
- 10-20 % of patients with DM have DR at Dx
- Eventually, all people with diabetes develop DR
  - Type I DM
    - 15 years duration–80% with DR, 25% with PDR
  - Type II DM
    - >20 years duration, >60% prevalence of DR
    - >25 years duration, 25% with PDR

Diabetic Retinopathy
Standard of Care

Minimum standard–annual eye examination

- **ADA**–American Diabetes Association
- **AAO**–American Academy of Ophthalmology
- **AOA**–American Optometric Association
- **VHA***–Veteran's Health Administration
- **DoD**–Department of Defense
- **HEDIS**–Health Plan Employer Data and Information Set

DR Surveillance in IHS

- CRS (GPRA) element #6–annual DR exam
- Qualifying examinations*†‡
  - Dilated Exam by optometrist or ophthalmologist
  - 7 standard field stereoscopic 35mm slides using ETDRS methodology
  - Photographic method validated to EDTRS

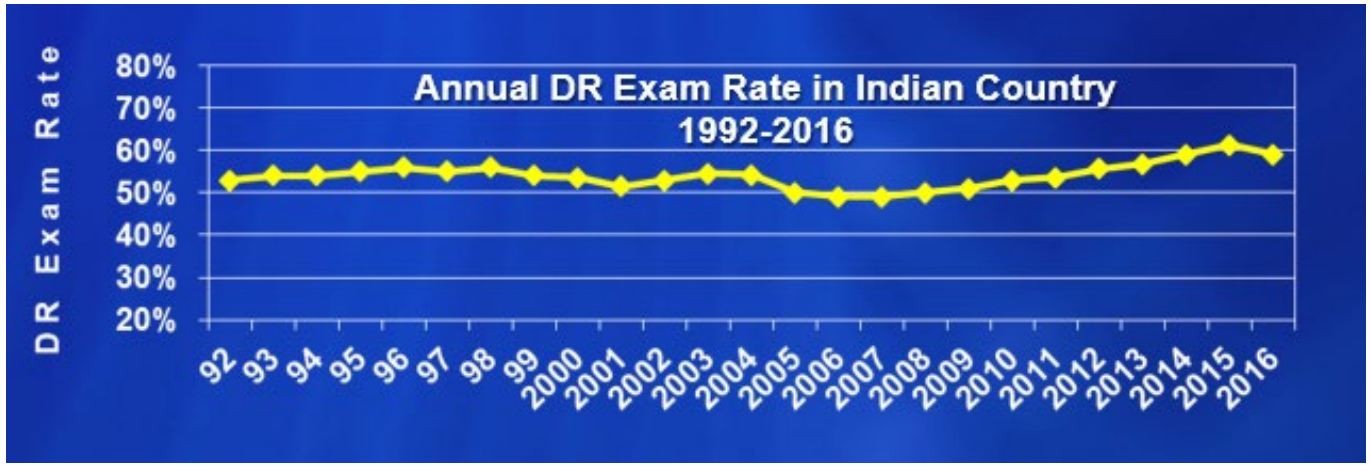
* AMA Physician Consortium for PI

† ADA Diabetes Alliance

‡ IHS

Diabetic Retinopathy

- Virtually all diabetics eventually have Diabetic Retinopathy
- Diabetic Retinopathy is the leading cause of new blindness in adults
- Blindness due to diabetes can be eliminated by timely Dx and Tx



Half of the AI/AN population with DM do not get timely Dx and Tx

IHS–Joslin Vision Network (JVN) Teleophthalmology Program

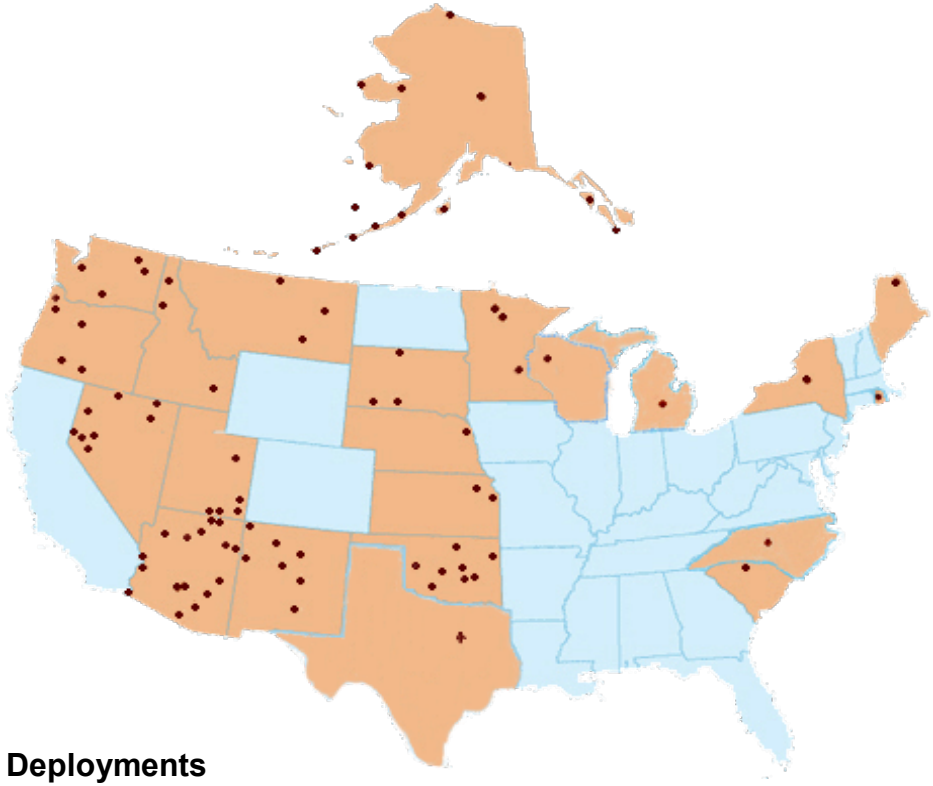
- Developed collaboratively with VA, DoD, IHS, and the Joslin Diabetes Center
- Clinical Deployments in IHS began in 2000
- National Distribution in 25 states

Diabetic Retinopathy Surveillance

IHS-JVN Teleophthalmology Program

89 Physical + 14 Mobile Sites in 25 States

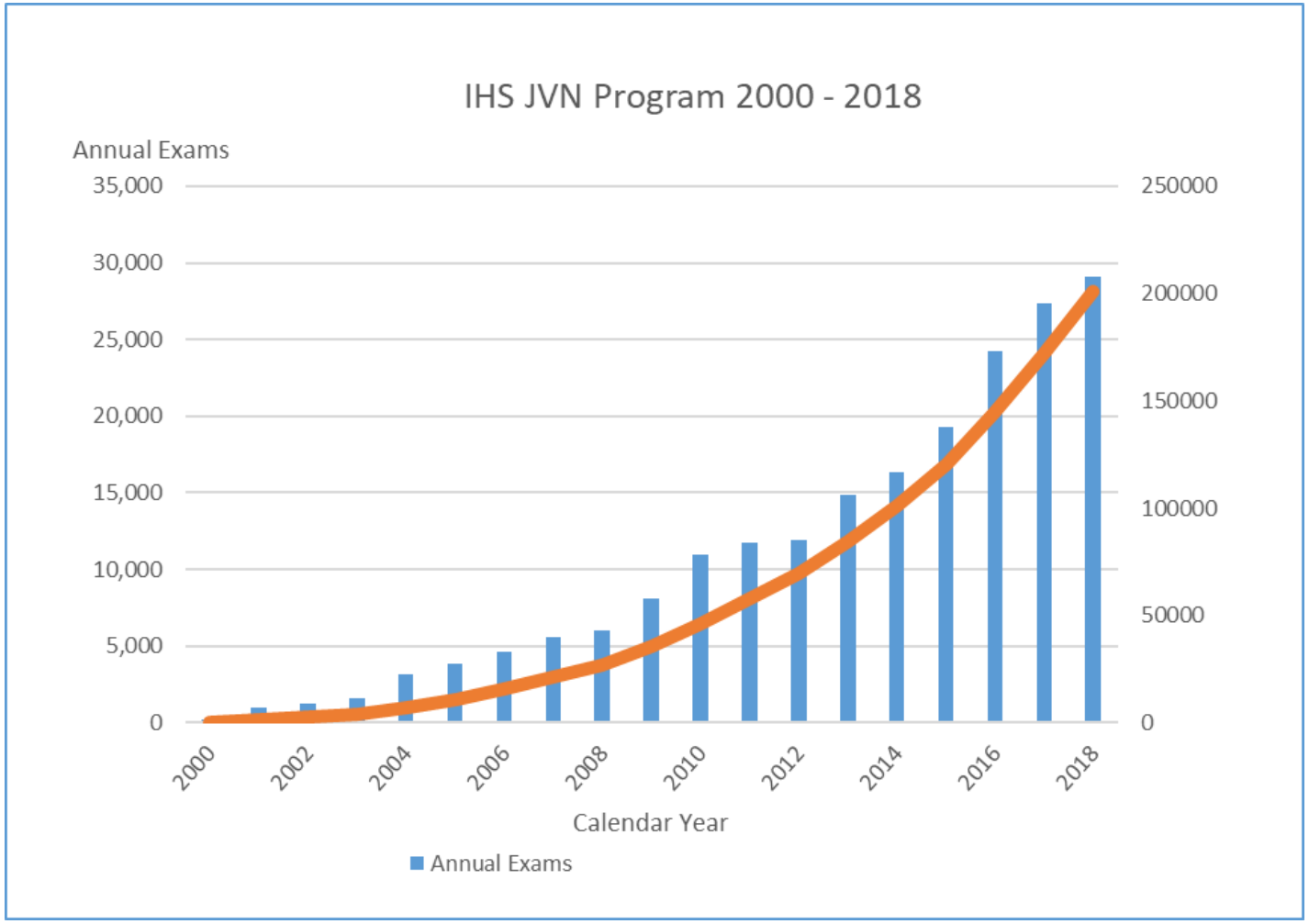
- Phoenix, AZ
- Polacca, AZ
- San Carlos, AZ
- Peach Springs, AZ
- Whiteriver, AZ
- Sells-, AZ
- Tuba City, AZ
- Tucson, AZ
- San Xavier, AZ
- Kayenta, AZ
- Chinle, AZ
- Flagstaff, AZ
- Inscription House, AZ
- Sacaton, AZ
- Fort Yuma, AZ
- Elko, NV
- Reno Sparks, NV
- Schurz, NV
- McDermitt, NV
- Owyhee, NV
- Pyramid Lake, NV
- Fallon, NV
- Cherokee, NC
- Ft Washakie, WY
- Three Rivers, OK
- A-Mo, OK
- Dallas, TX
- A-Mo, OK
- Carnegie, OK
- Claremore, OK
- Eufaula, OK
- Okmulgee, OK
- Oklahoma City, OK
- Tahlequah, OK
- Lawrence, KS
- Mayetta, KS
- Portland, OR
- Warm Springs, OR
- Salem, OR
- Cow Creek, OR
- Nespelem, WA
- Yakama, WA
- Wellpinit, WA
- Tacoma, WA
- Fort Hall, ID
- Lapwai, ID
- Plummer, ID
- Pine Ridge, SD
- Kyle, SD
- Four Corners, AZ
- Supalpa, OK
- Redbird, OK
- Browning, MT
- Ft Belknap, MT
- Lame Deer, MT
- Crow Agency, MT
- Red Lake, MN
- Minneapolis, MN
- Cass Lake, MN
- Choctaw, MS
- Acoma, NM
- Four Corners, NM
- Shiprock, NM
- Santa Fe, NM
- Albuquerque, NM
- Mescalero, NM
- Crown Point, NM
- Jicarilla, NM
- Gallup, NM
- Winnebago, NE
- Hayward, WI
- Oneida, NY
- Charlestown, RI
- Fairbanks, AK
- Rock Hill, SC
- Cherokee, NC
- U&O, UT
- Pesque Isle, ME



Planned Deployments

- Multiple Oklahoma sites
- Eagle Butte, SD
- Rosebud, SD

JVN Examinations



Diabetic Retinopathy (cont.)

- DR blindness is preventable by adhering to accepted standards of care and established best practices
  - Identify all patients with DM
  - Control confounding factors and co-morbidities
  - Diagnose level of DR yearly
  - Apply timely treatment

Diabetic Retinopathy
Clinical Management

Primary Care Diabetes Team

+

Ophthalmologist / Optometrist

Leads to:

Systemic control

Timely diagnosis

Early treatment

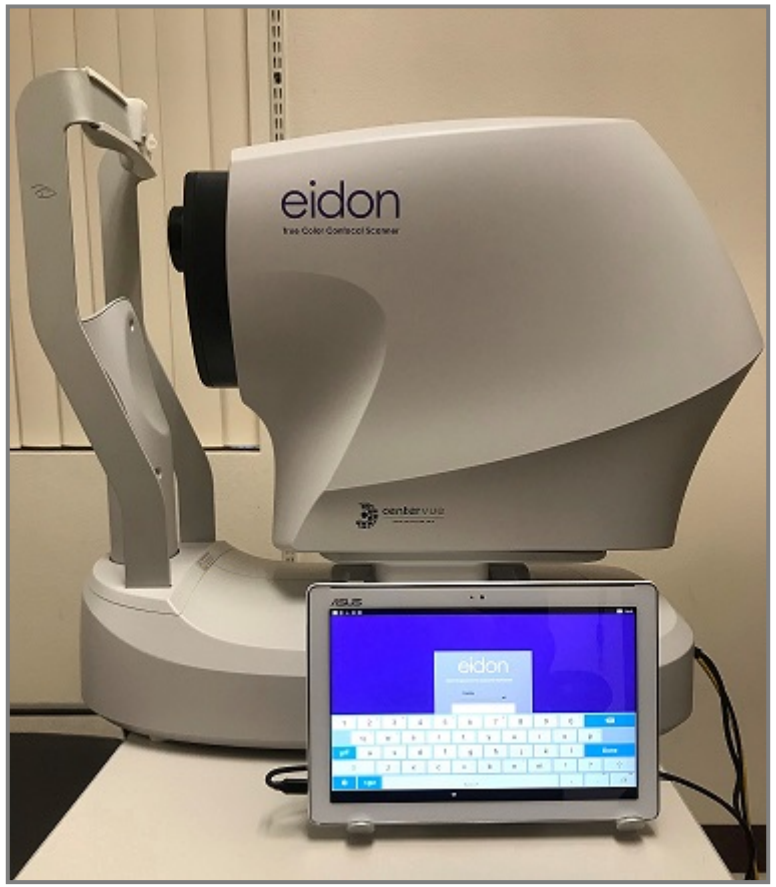
IHS/JVN: A Primary Care Tool
IAS in Primary Care Clinic

- Focused recruitment
  - Patients with no retinal exam with in one year
- Generalized recruitment
  - All individuals with DM
  - Routine component of DM intake

JVN Physical Components
JVN Image Acquisition Station

- Retinal Image Acquisition by certified imager in primary care clinic
  - No pupil dilation
  - Patient Education
  - Data transmission to Reading Center
    - Images
    - Health Summary

Newest JVN Image Acquisition Station

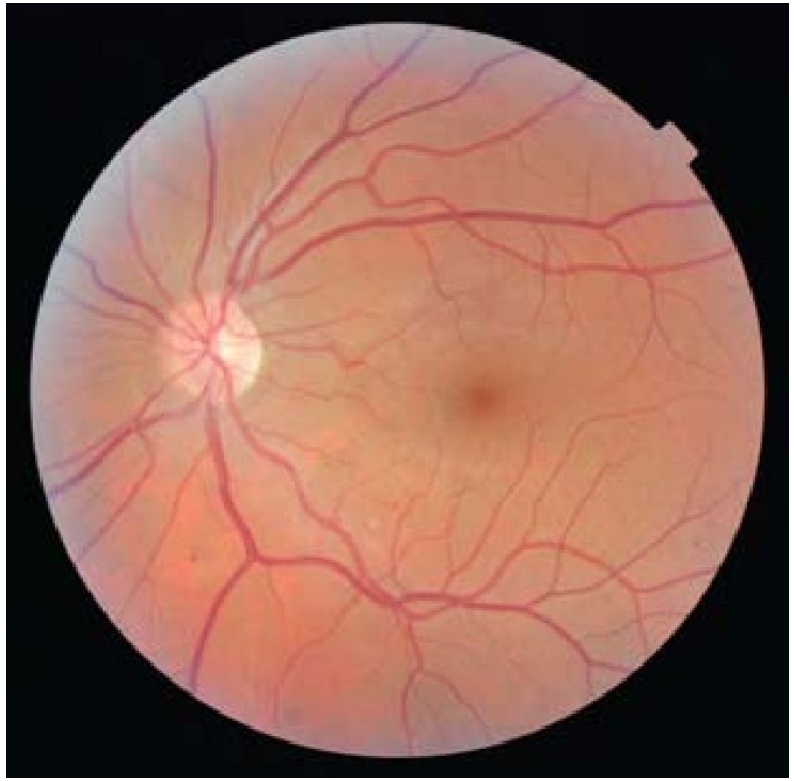


JVN

Mobile Camera

Comparison Fields of View

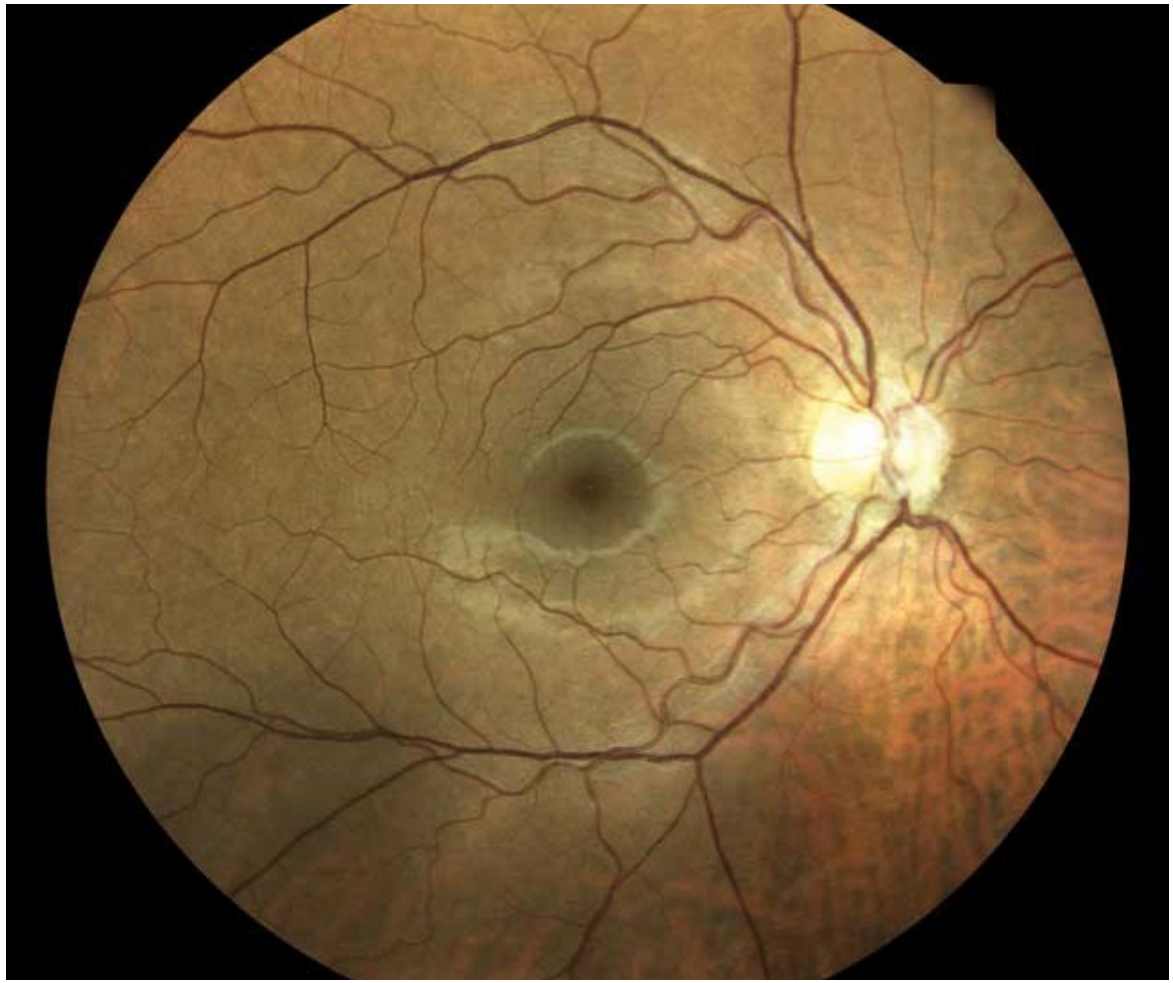
Topcon NW6S



Optos Daytona

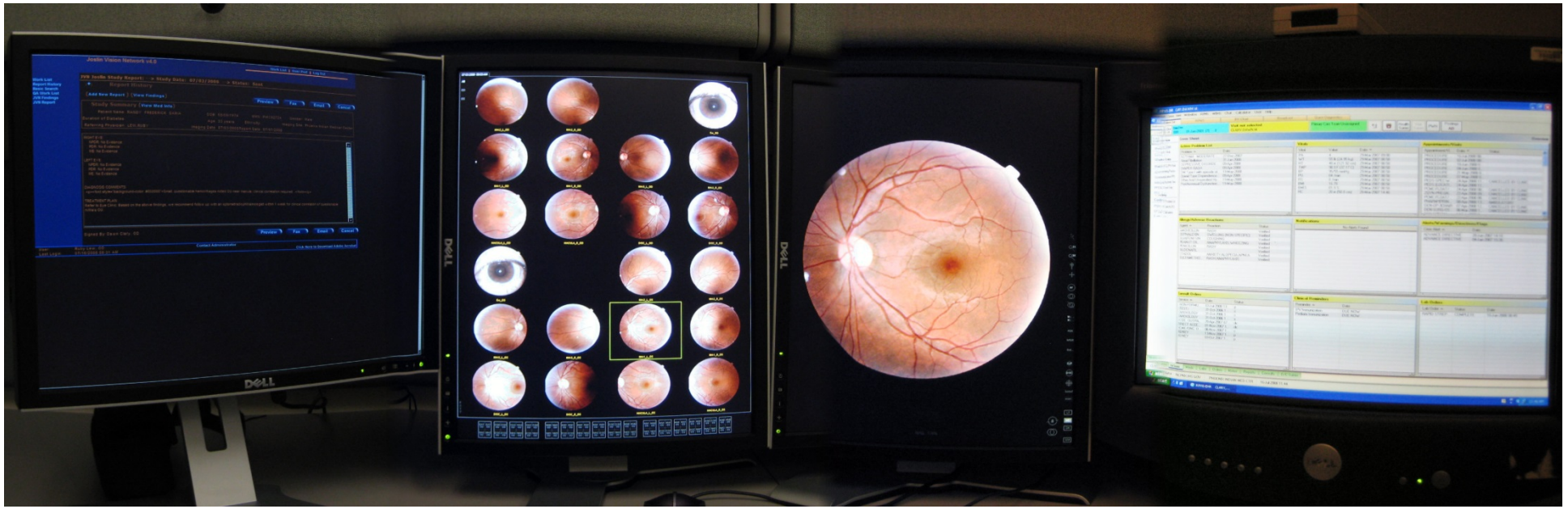
Comparison Fields of View (cont.)

Centervue Eidon

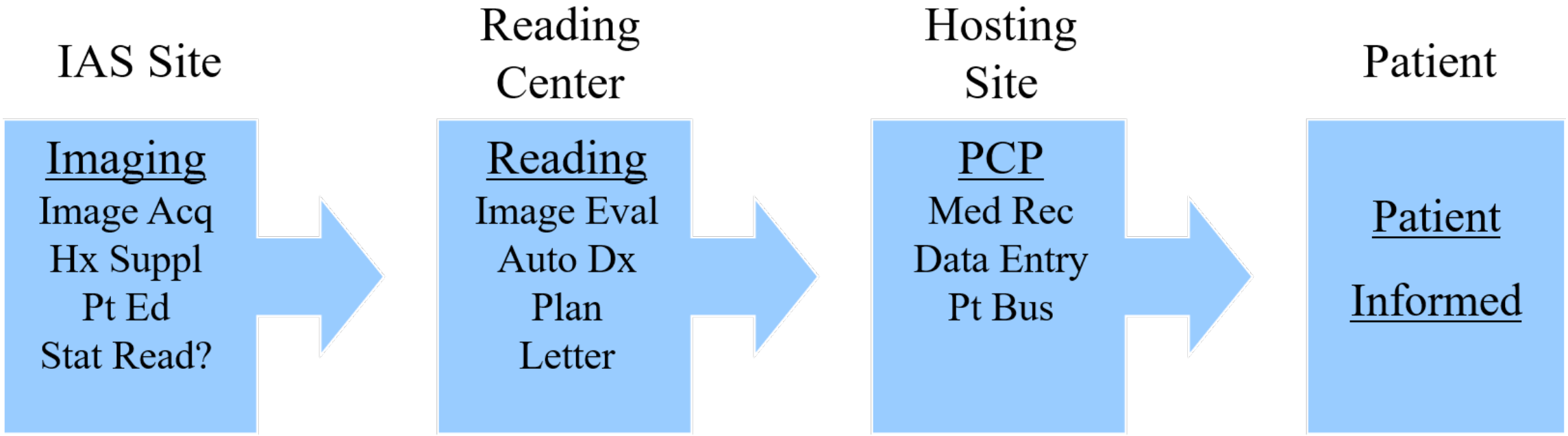


JVN Physical Components
JVN Diagnostic Workstation

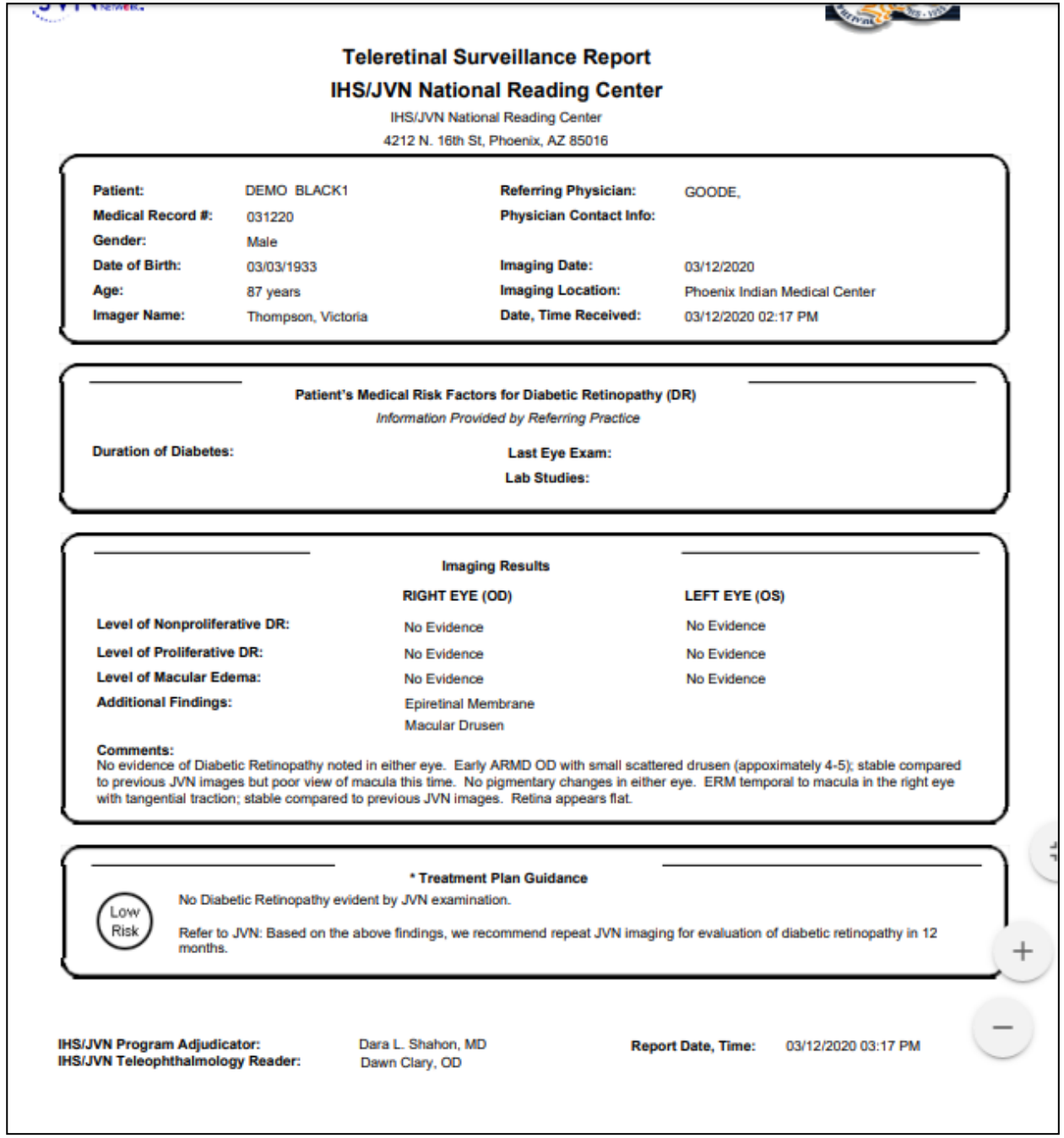
- Image analysis
- Automated diagnosis with reader validation
- Automated documentation



IHS/JVN: Workflow



Teleretinal Surveillance Report



Teleretinal Surveillance Report

IHS/JVN National Reading Center

IHS/JVN National Reading Center
4212 N. 16th St, Phoenix, AZ 85016

Patient:	DEMO BLACK1	**Referring Physician:**	GOODE,
Medical Record #:	031220	**Physician Contact Info:**	
Gender:	Male		
Date of Birth:	03/03/1933	**Imaging Date:**	03/12/2020
Age:	87 years	**Imaging Location:**	Phoenix Indian Medical Center
Imager Name:	Thompson, Victoria	**Date, Time Received:**	03/12/2020 02:17 PM

Patient's Medical Risk Factors for Diabetic Retinopathy (DR)

Information Provided by Referring Practice

Duration of Diabetes:

Last Eye Exam:

Lab Studies:

Imaging Results

	RIGHT EYE (OD)	LEFT EYE (OS)
Level of Nonproliferative DR:	No Evidence	No Evidence
Level of Proliferative DR:	No Evidence	No Evidence
Level of Macular Edema:	No Evidence	No Evidence
Additional Findings:	Epiretinal Membrane Macular Drusen	

Comments:
No evidence of Diabetic Retinopathy noted in either eye. Early ARMD OD with small scattered drusen (appoximately 4-5); stable compared to previous JVN images but poor view of macula this time. No pigmentary changes in either eye. ERM temporal to macula in the right eye with tangential traction; stable compared to previous JVN images. Retina appears flat.

*** Treatment Plan Guidance**

Low Risk

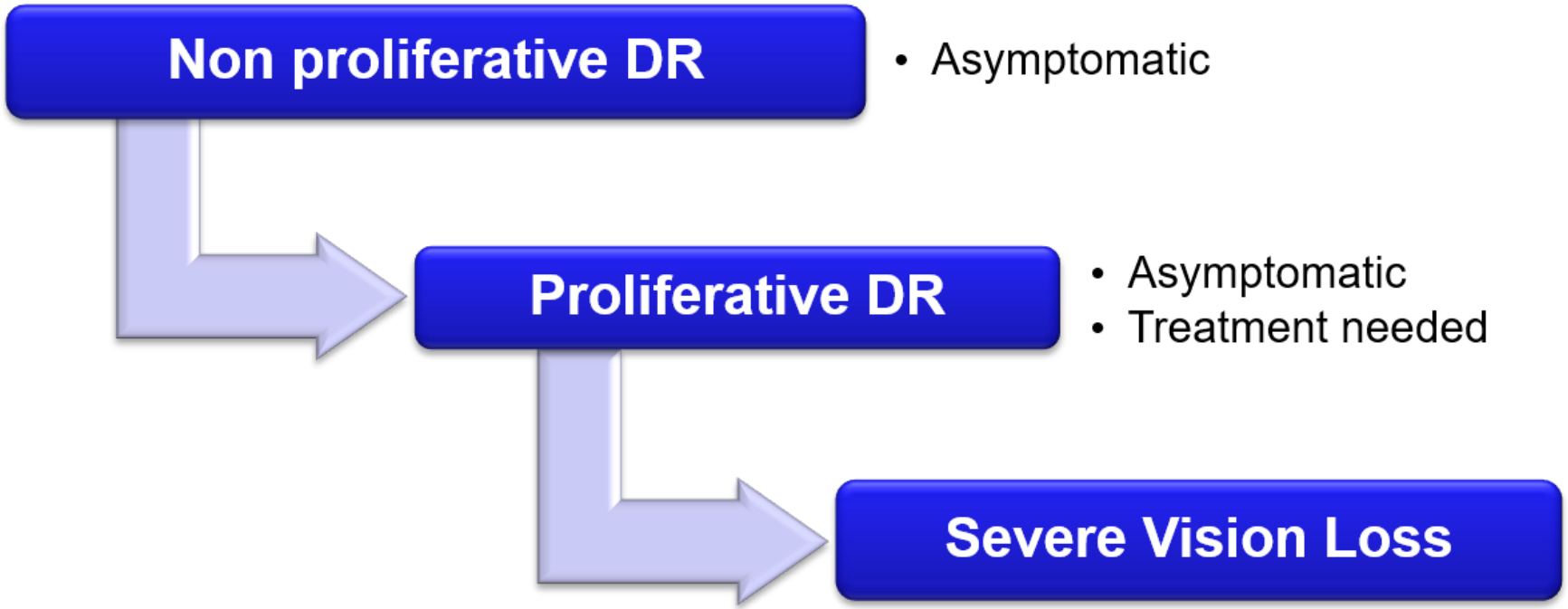
No Diabetic Retinopathy evident by JVN examination.

Refer to JVN: Based on the above findings, we recommend repeat JVN imaging for evaluation of diabetic retinopathy in 12 months.

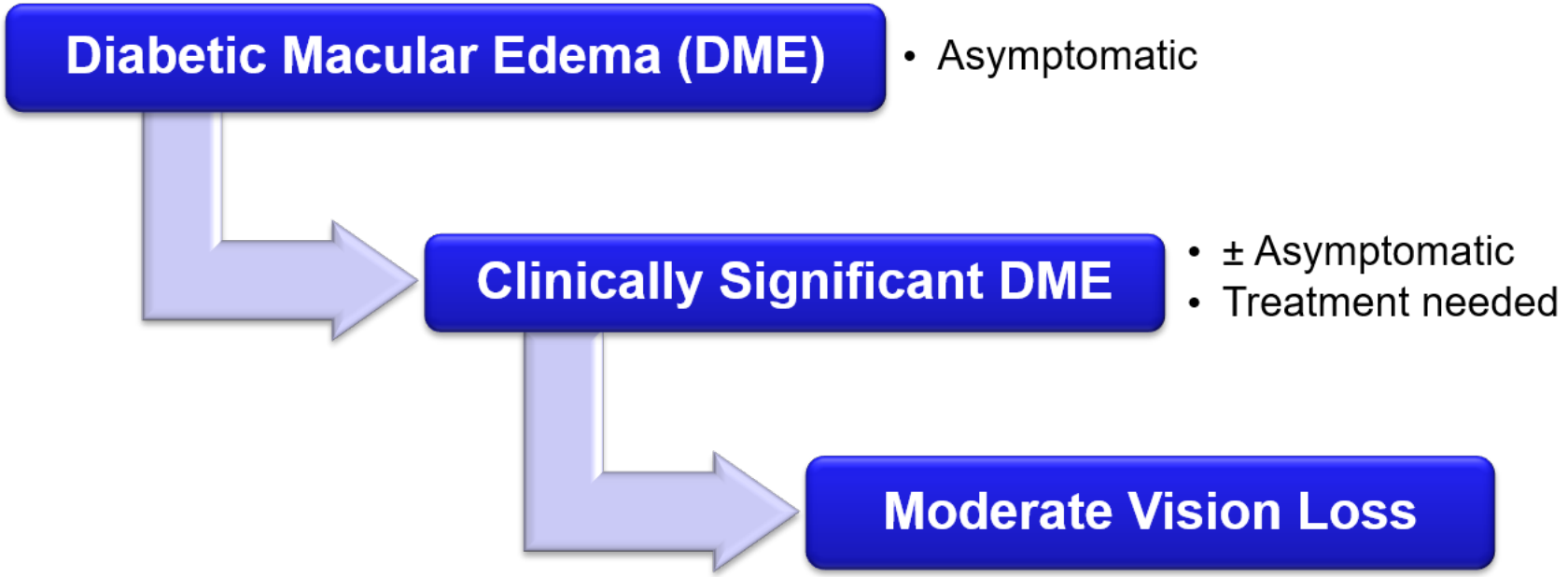
IHS/JVN Program Adjudicator: Dara L. Shahon, MD
IHS/JVN Teleophthalmology Reader: Dawn Clary, OD

Report Date, Time: 03/12/2020 03:17 PM

Diabetic Retinopathy
Clinical Levels–Diabetic Retinopathy



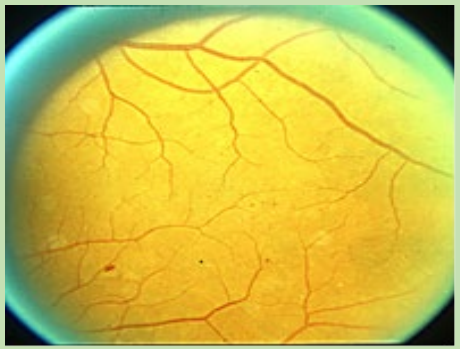
Diabetic Retinopathy
Clinical Levels–Diabetic Macular Edema



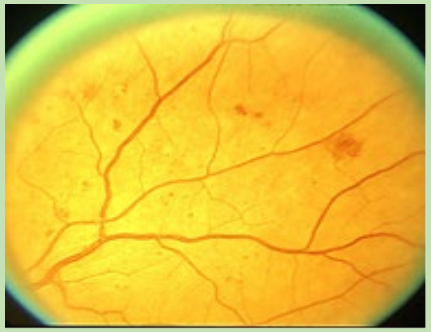
Diabetic Retinopathy
DR Disease Severity Scale

DR Severity Level	Retinal Characteristics
No DR	No abnormalities
Very Mild NPDR	< 5 micro aneurysms
Mild NPDR	>= 5 Micro aneurysms
Moderate NPDR	> MA, CWS but < severe NPDR
Severe NPDR	> 20 intra-retinal hemorrhages in 4 quad Venous beading in 2 or more quad Prominent IRMA in 1 or more quad No PDR
PDR	Neovascularization (NVD and/or NVE) Vitreous Hemorrhage

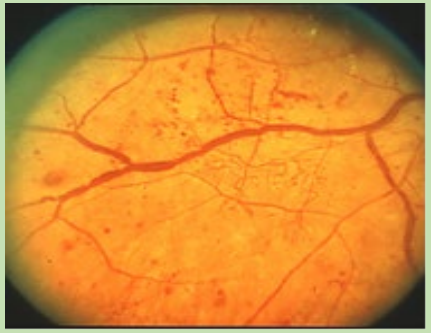
Diabetic Retinopathy
Clinical Levels



Mild nonproliferative DR



Moderate nonproliferative DR



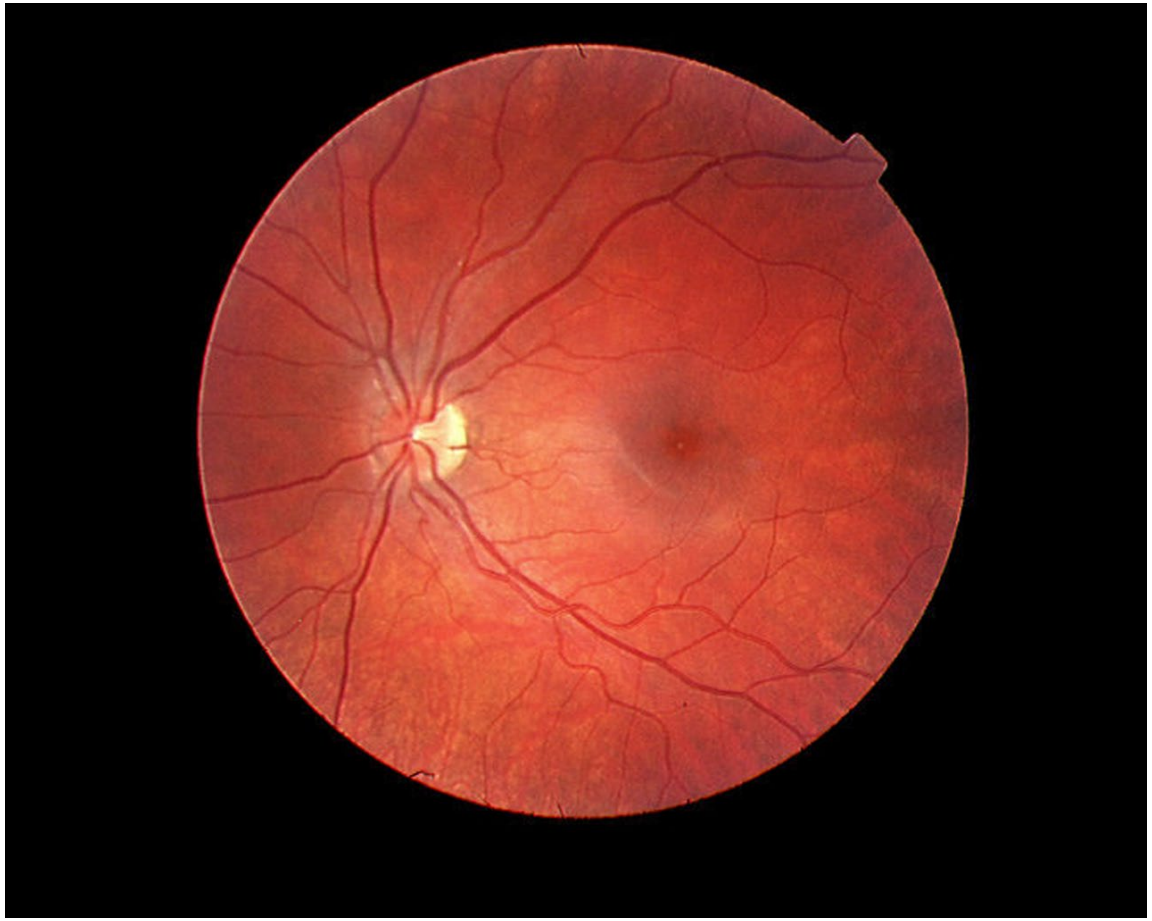
Severe nonproliferative DR

Proliferative DR

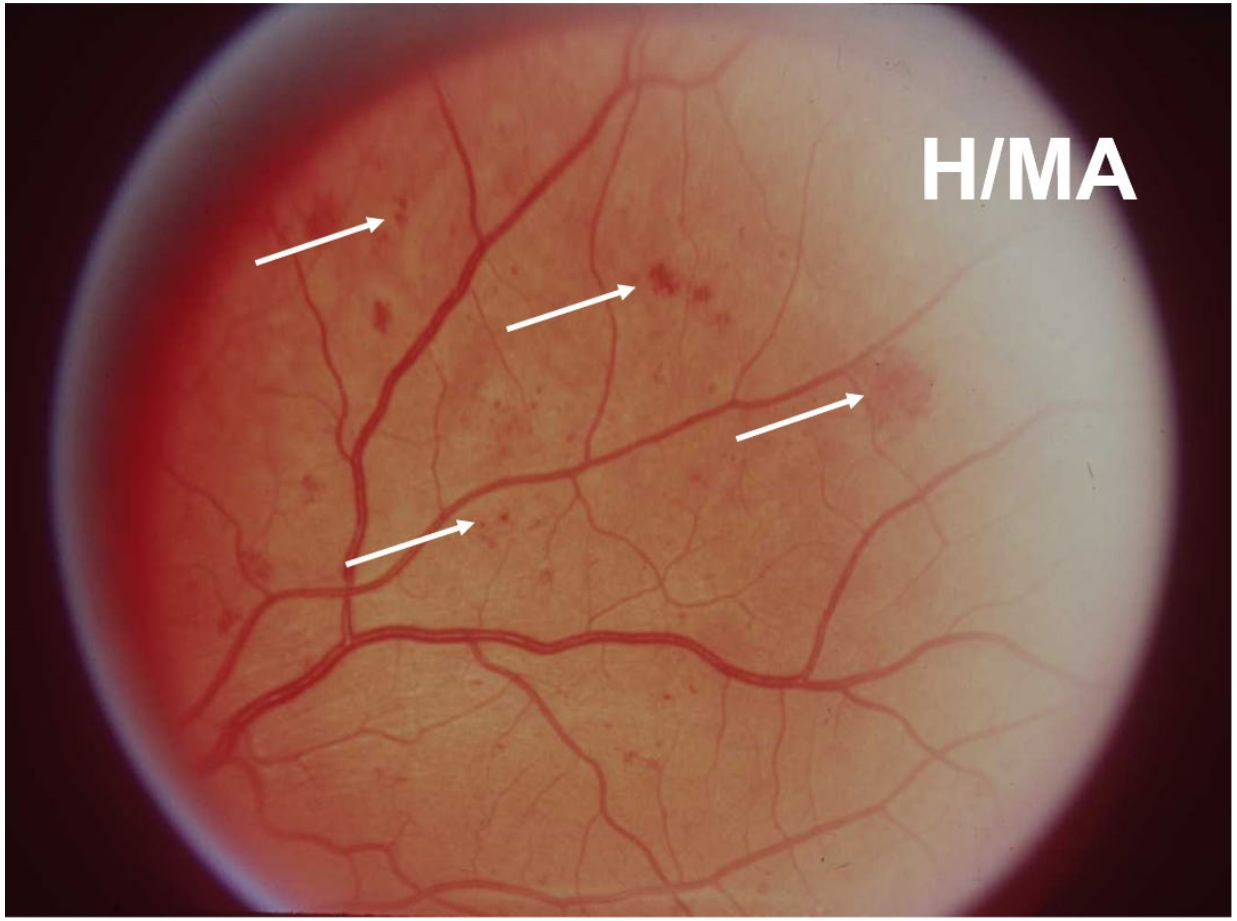
Proliferative DR

Diabetic macular edema

No Diabetic Retinopathy

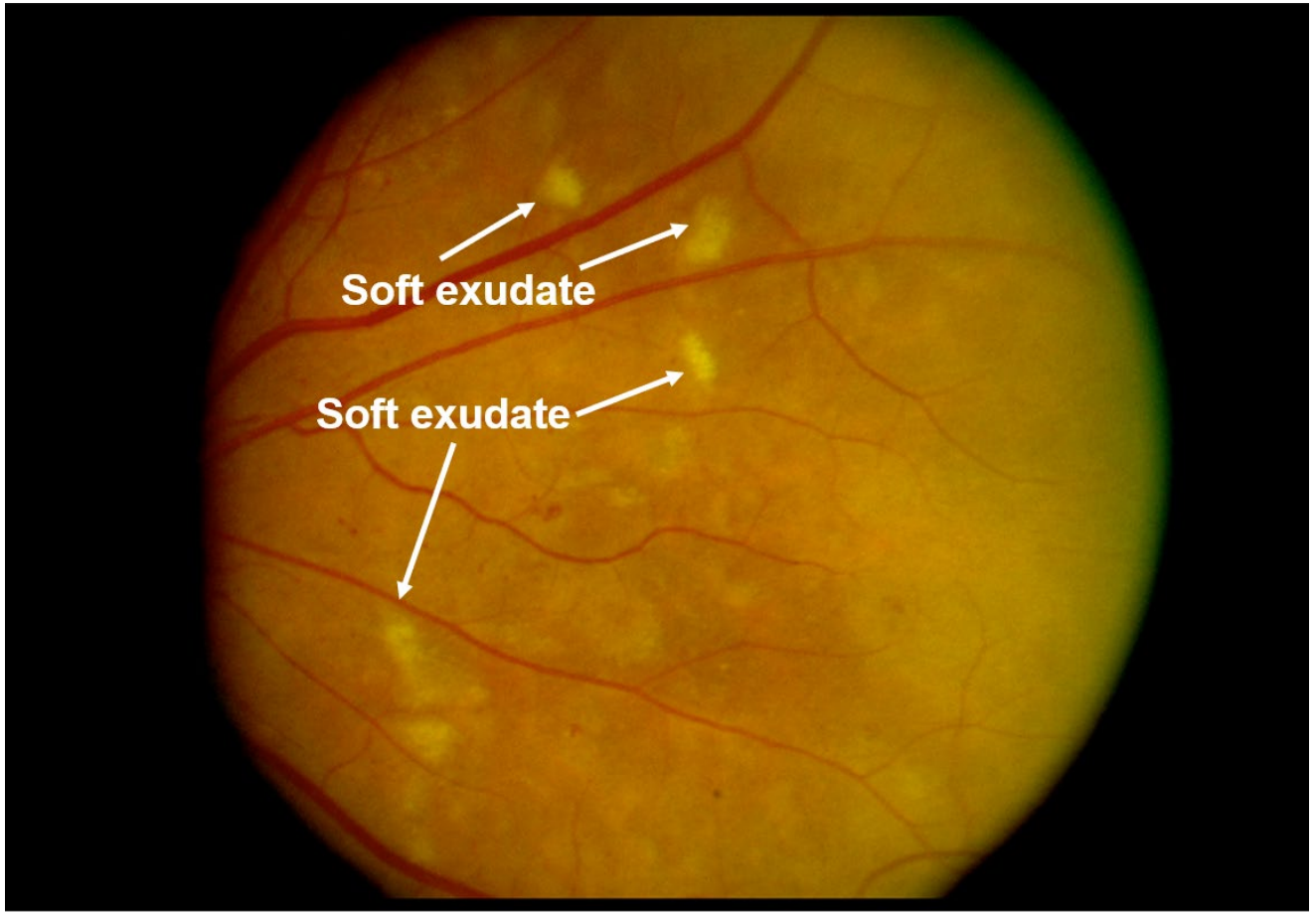


Diabetic Retinopathy
Clinical Components–MA, hemorrhages

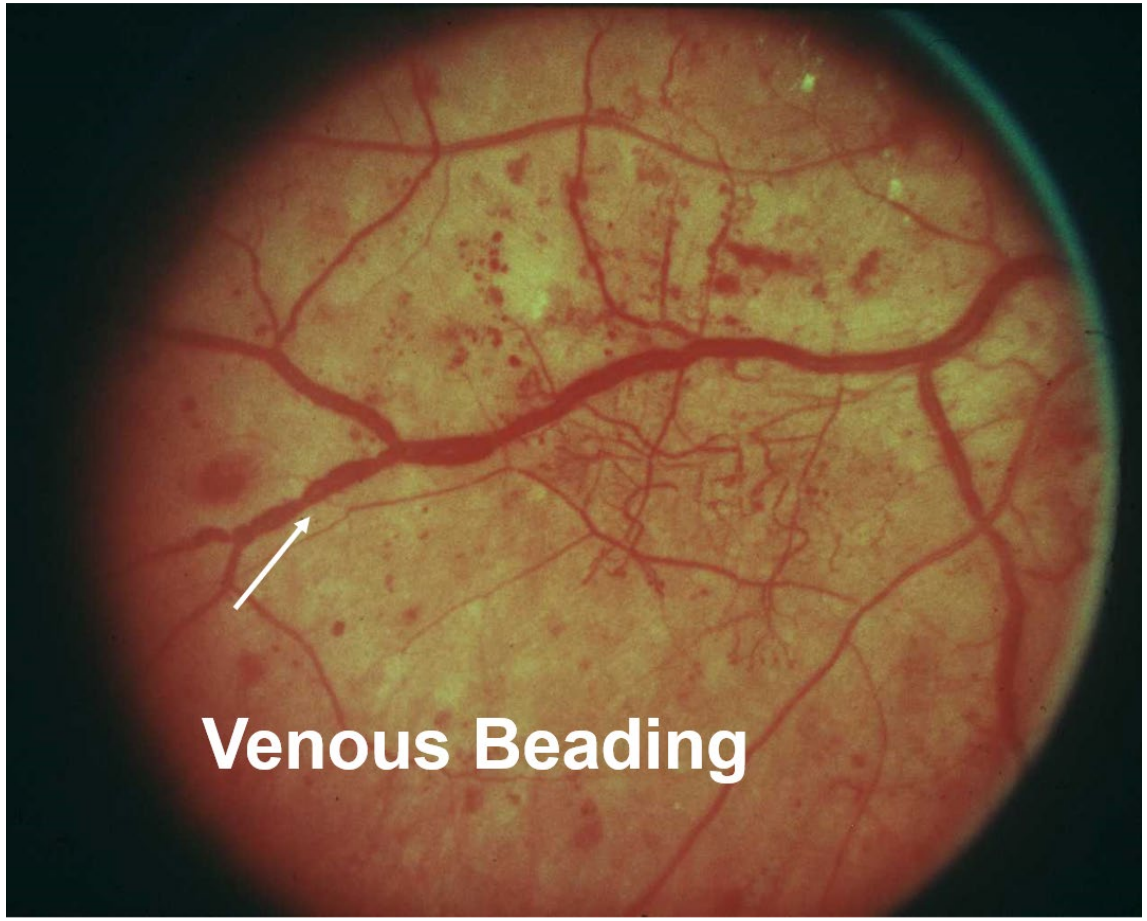


Diabetic Retinopathy
Clinical Components–MA, hemorrhages (cont.)

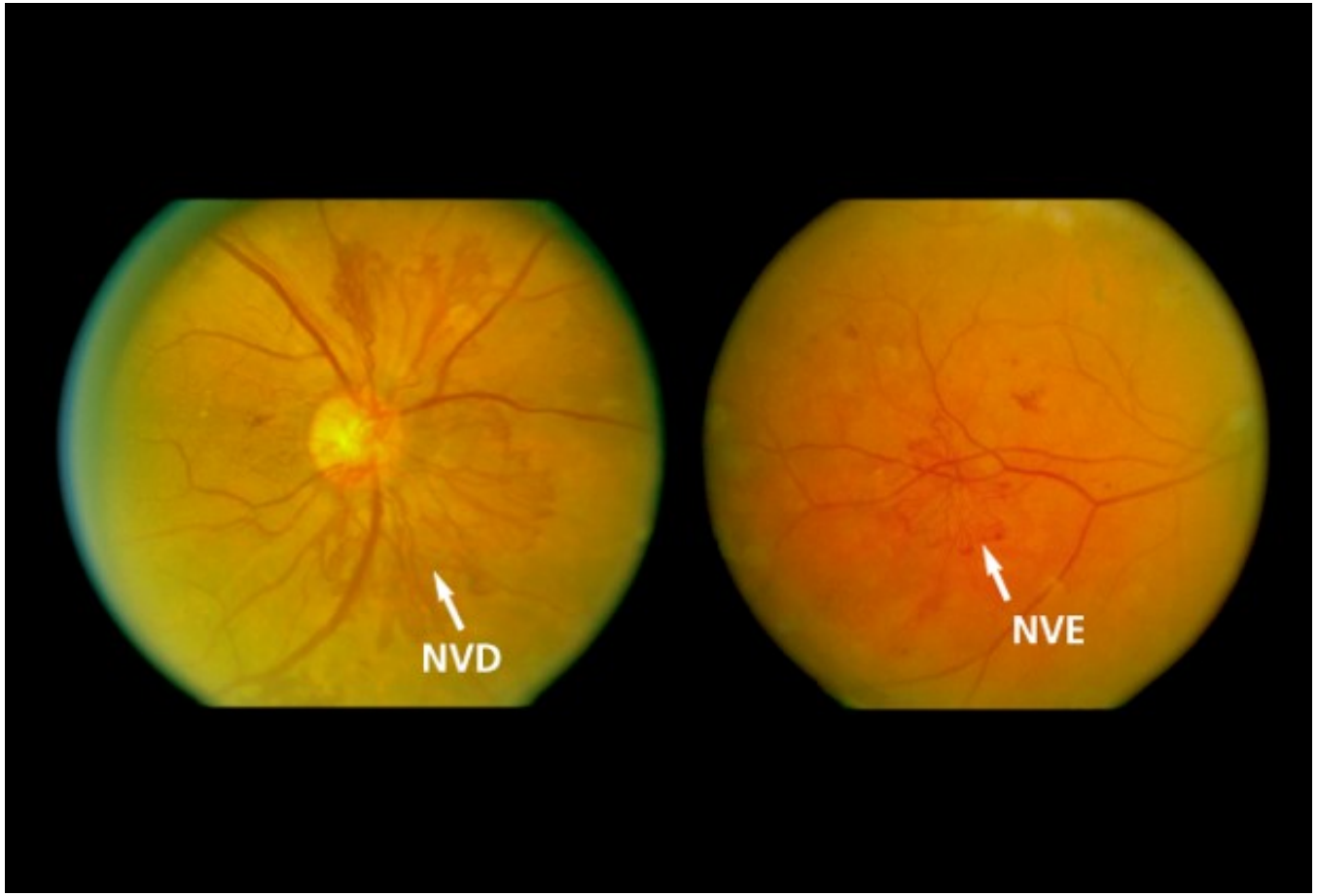
Diabetic Retinopathy
Clinical Components–Soft Exudates



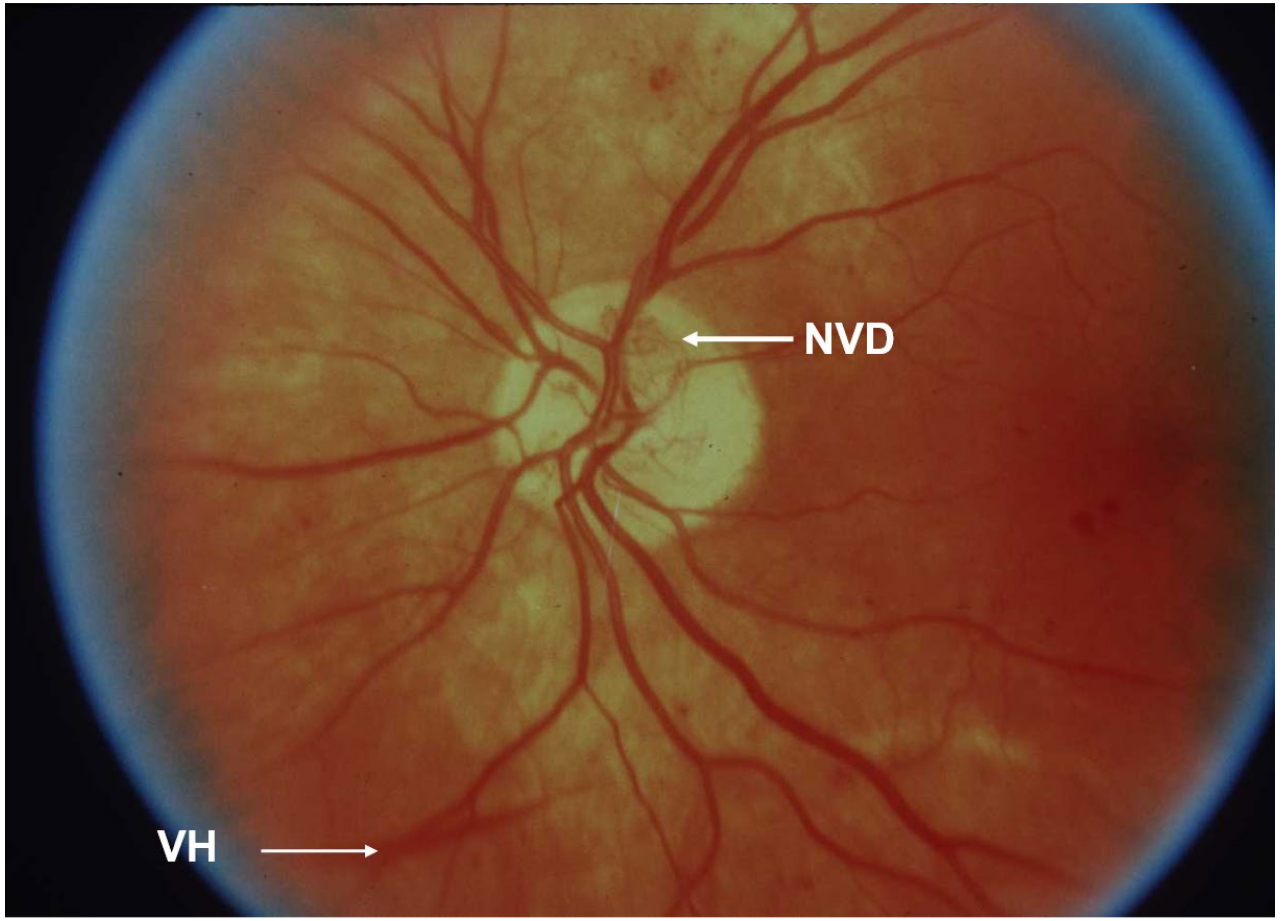
Diabetic Retinopathy
Clinical Components–Venous Beading



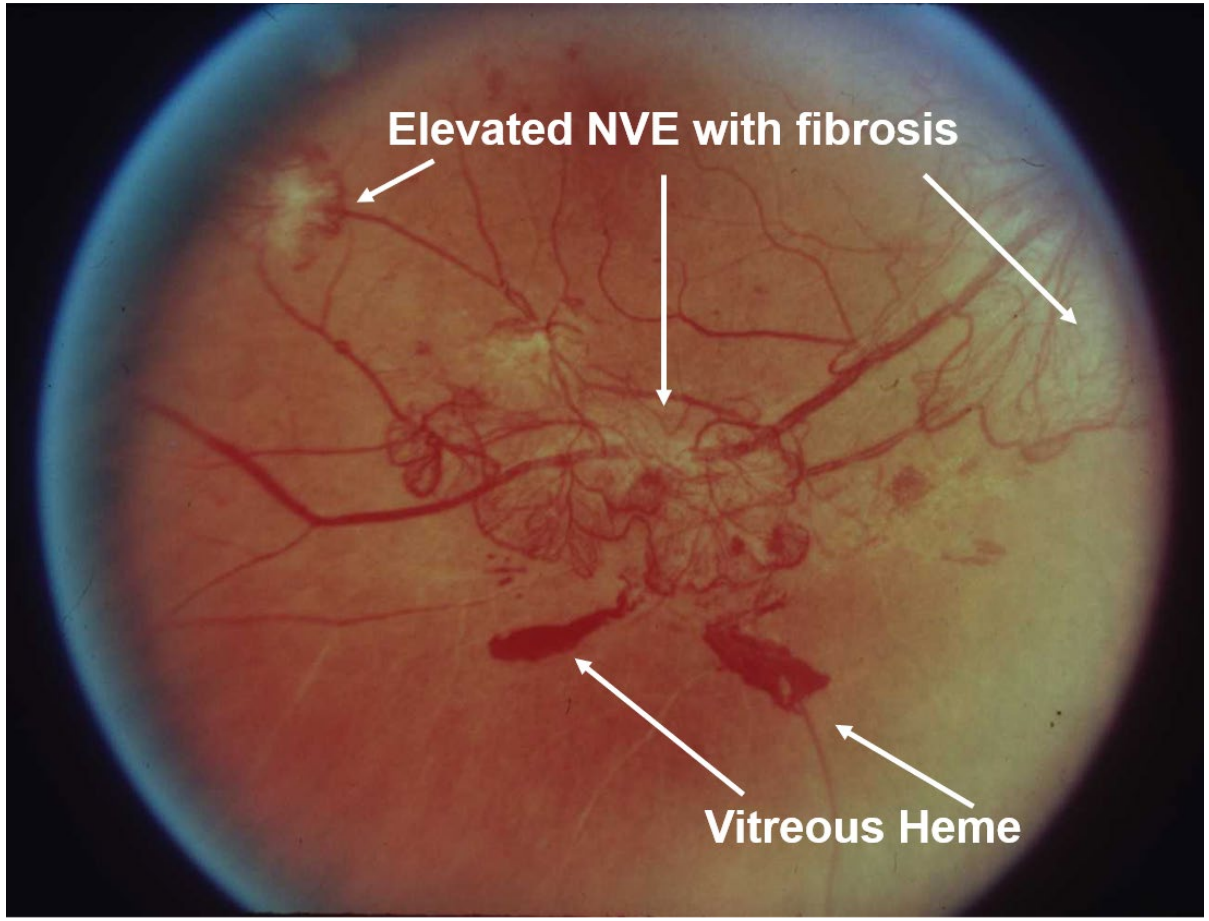
Diabetic Retinopathy
Clinical Components–Neovascularization



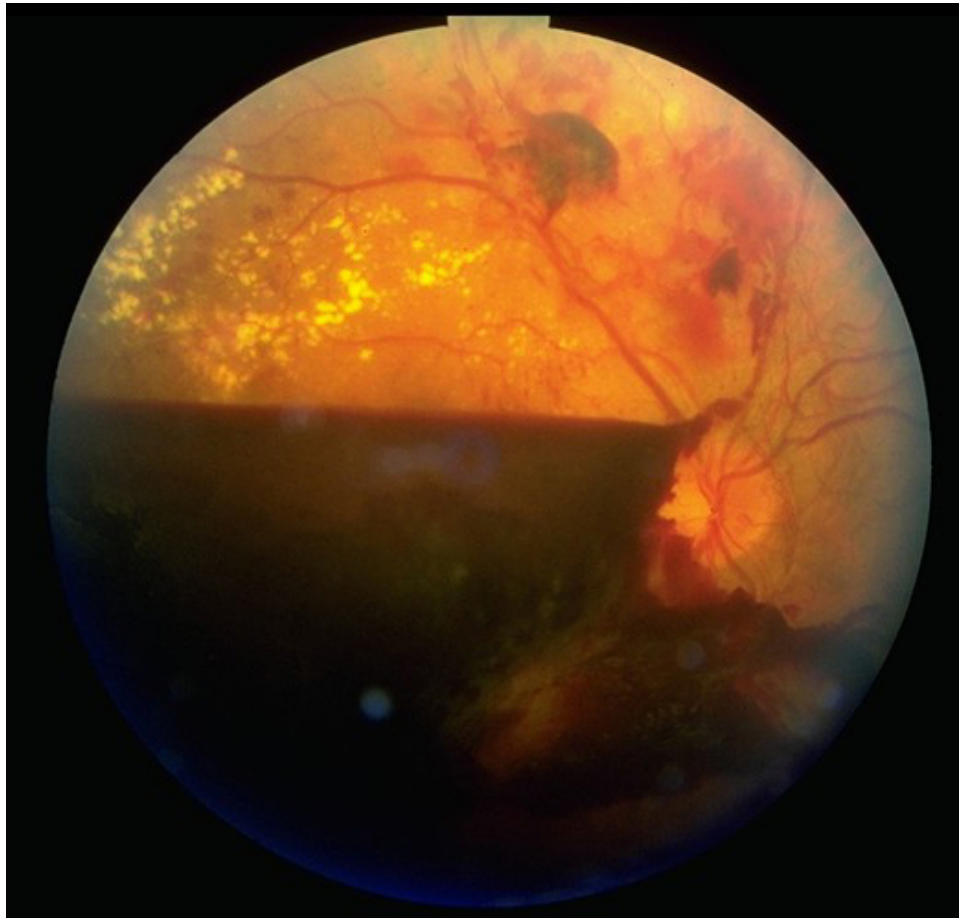
Diabetic Retinopathy
Clinical Components–Neovascularization (cont.)



Diabetic Retinopathy
Clinical Components–Neovascularization (more)



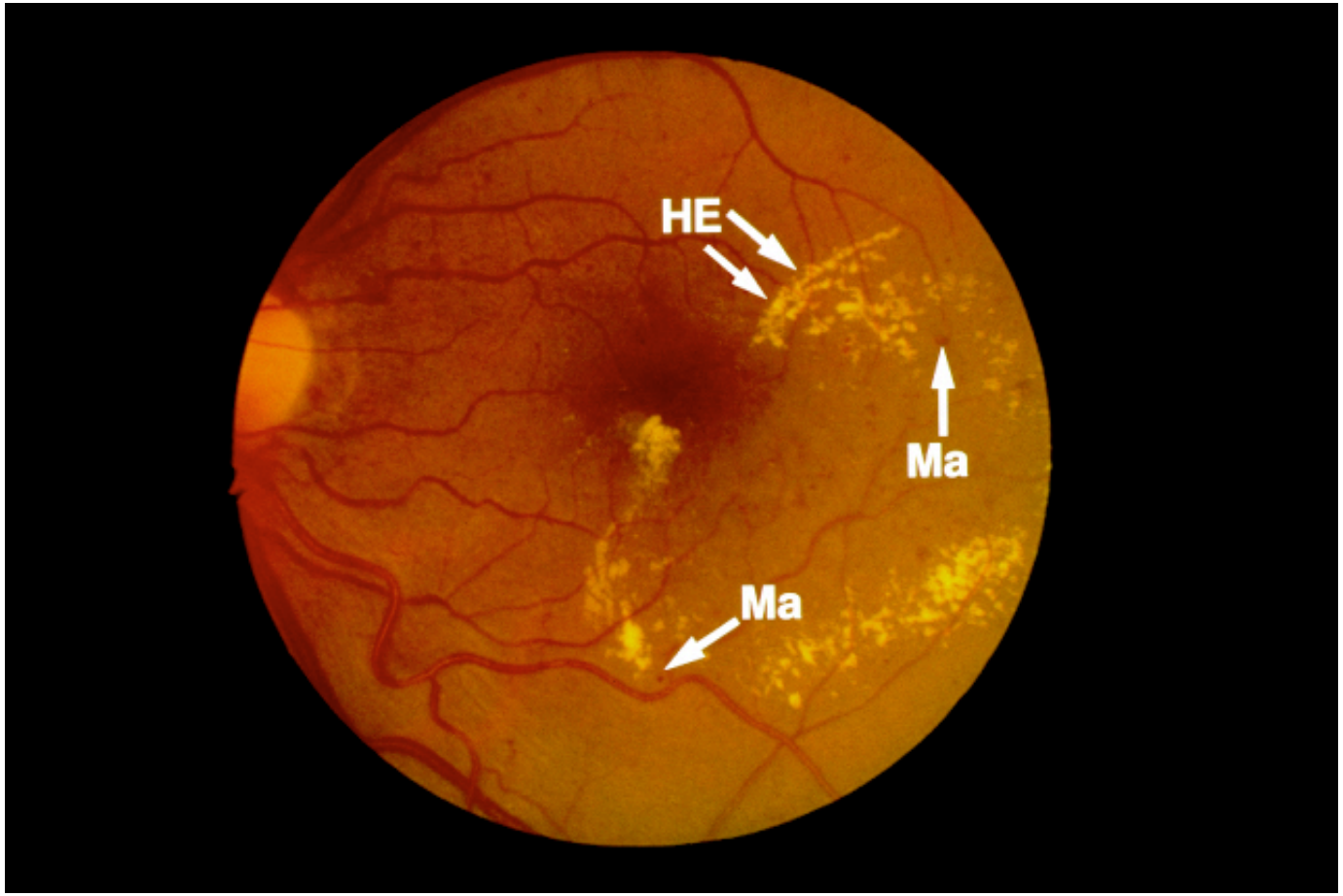
Diabetic Retinopathy
Clinical Components–Vitreous Hemorrhage



Diabetic Retinopathy
DME Severity Scale

DR Severity Level	Retinal Characteristics
Macular Edema- not clinically significant	**Retinal edema or lipids not threatening the macula**
Macular Edema- clinically significant (CSME)	**Retinal edema or lipids threatening the macula**

Diabetic Retinopathy
Clinical Components–Hard Exudates



Diabetic Retinopathy
Clinical Components–Hard Exudates (cont.)

Joslin Vision Network (JVN)

- Quick and painless
  - Low level illumination
  - No pupil dilation
- Non-invasive
- Interleaved with other patient encounter events
- Validated

JVN (cont.)

- High Patient Satisfaction
- High Provider Satisfaction
- Meets Standard of Care

JVN (more)

- No Cost – Direct / Indirect
- Billable

Reading Center Staff

Readers

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Dr. Ruby Lew

Dr. Kimberley Cunningham

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Dr. Dara Shahon

Imagers

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Support Staff

Jared McCain

Nilam Shah

Types of JVN Training

Optos Daytona

Initial Certification

Remote Imager Training *

Refresher Training

Centervue Eidon

Initial Certification

Remote Imager Training *

Refresher Training

JVN Workshop Overview

Supervisors

Providers

IHS/JVN
Teleophthalmology Program

Questions?

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