

Supplementary Materials

Supplementary Appendix 1—Approaches for vision measurement and patient selection

Vision measurement

- Definition of good vision: at least one of the qualifying visual acuity (VA) readings of 20/40 or better had to be within 3 months of their incident diabetic retinopathy diagnosis in the study eye.
- Inclusion in the study population: if there were multiple VA measurements performed on the same day, the value used for analysis was taken in the following order, depending on availability: 1) pinhole VA; 2) best-corrected VA; 3) corrected VA; and 4) unspecified VA.
- Event of interest: for patients with several VA readings during a visit, the VA was chosen in the following order: 1) pinhole VA; 2) best-corrected VA); and 3) corrected VA.

Exclusion criteria

- Diagnosis with any of the following conditions: wet or dry age-related macular degeneration, geographic atrophy, vitreous hemorrhage, retinal detachment, neovascular glaucoma, retinal vein occlusion, and diabetic macular edema.

Supplementary Table 1—List of diagnostic codes used for identification of patients with newly diagnosed DR†,‡

ICD code categorization	ICD-9-CM		ICD-10-CM				
DR with DME			E08.311	E09.311	E10.311	E11.311	E13.311
			E08.321	E09.321	E10.321	E11.321	E13.321
			E08.331	E09.331	E10.331	E11.331	E13.331
			E08.341	E09.341	E10.341	E11.341	E13.341
			E08.351	E09.351	E10.351	E11.351	E13.351
DR without DME			E08.319	E09.319	E10.319	E11.319	E13.319
			E08.329	E09.329	E10.329	E11.329	E13.329
			E08.339	E09.339	E10.339	E11.339	E13.339
			E08.349	E09.349	E10.349	E11.349	E13.349
			E08.359	E09.359	E10.359	E11.359	E13.359
Unspecified DR	362	362.01 362.03 362.07	E08.31	E09.31	E10.31	E11.31	E13.31
Mild NPDR	362.04		E08.32	E09.32	E10.32	E11.32	E13.32
Moderate NPDR	362.05		E08.33	E09.33	E10.33	E11.33	E13.33
Severe NPDR	362.06		E08.34	E09.34	E10.34	E11.34	E13.34
PDR	362.02		E08.35	E09.35	E10.35	E11.35	E13.35
Cataract	366.*		H25.*	H26.*			
Glaucoma	365.*		H40.* (except neovascular glaucoma codes)				
Neovascular glaucoma	365.63		H40.5	H40.89			

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Nonneovascular AMD	362.51	H35.31				
Neovascular AMD	362.52	H35.32				
RVO	362.35 362.36	H34.81	H34.83			
mCNV	360.21	H35.05	H44.20			
			H44.21			
			H44.22			
			H44.23			
			H44.2A			
Vitreous hemorrhage	379.23	H43.1*				
Tractional retinal detachment	361.81	E08.352	E09.352	E10.352	E11.352	E13.352
		E08.353	E09.353	E10.353	E11.353	E13.353
		E08.354	E09.354	E10.354	E11.354	E13.354
		H33.4*				
Other retinal detachment	361.* (except 361.81)	H33.0				
		H33.2				
		H33.8				

AMD, age-related macular degeneration; DME, diabetic macular edema; DR, diabetic retinopathy; ICD-9-CM, International Classification of Diseases, Ninth Revision, Clinical Modification; ICD-10-CM, International Classification of Diseases, Tenth Revision, Clinical Modification; mCNV, myopic choroidal neovascularization; NPDR, nonproliferative diabetic retinopathy; PDR, proliferative diabetic retinopathy; RVO, retinal vein occlusion.

†If a patient had ICD-9-CM and ICD-10-CM codes linked to DR diagnoses on the same day, to eliminate redundancy and incorporate the greatest amount of detail and laterality information, ICD-10-CM codes were prioritized.

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‡At least two diagnoses of DR in the study eye to confirm the condition (the date of the first DR diagnosis was defined as the index date in the study).

Supplementary Table 2—List of CPT codes used for identification of patients with newly diagnosed DR

CPT code categorization	CPT codes
Vitreotomy	67036 67043 67039 67108 67040 67113 67041 67010 67042 67112
Retinal detachment repair	67113 67110 67107 67112 67108 67101
Tractional retinal detachment	67113

CPT, Current Procedural Terminology; DR, diabetic retinopathy.

Supplementary Table 3—Risk factor assessment for development of sustained blindness, models 1 and 2

Variable	Level	Reference	Model 1				Model 2			
			HR	95% CI		P Value	HR	95% CI		P Value
	Lower	Upper			Lower			Upper		
Exposure of interest										
DR severity at index										
	Unspecified	Mild NPDR	1.19	1.11	1.27	<0.0001	1.14	1.06	1.22	0.0002
	Moderate NPDR	Mild NPDR	1.91	1.74	2.10	<0.0001	1.63	1.48	1.79	<0.0001
	Severe NPDR	Mild NPDR	2.64	2.26	3.09	<0.0001	2.11	1.80	2.48	<0.0001
	PDR	Mild NPDR	2.43	2.26	2.63	<0.0001	2.26	2.09	2.45	<0.0001
Covariates – index characteristics										
Age at baseline (years)										
	50–59	<50	0.74	0.67	0.81	<0.0001	0.71	0.64	0.78	<0.0001
	60–69	<50	0.57	0.52	0.63	<0.0001	0.54	0.49	0.60	<0.0001
	70–79	<50	0.54	0.49	0.60	<0.0001	0.53	0.48	0.59	<0.0001
	≥80	<50	0.67	0.60	0.75	<0.0001	0.63	0.56	0.71	<0.0001
Sex										
	Female	Male	1.11	1.05	1.17	0.0002	1.13	1.08	1.20	<0.0001
Race										
	Black	White	1.29	1.21	1.38	<0.0001	1.14	1.07	1.22	<0.0001
	Asian	White	1.36	1.17	1.58	<0.0001	1.33	1.14	1.55	0.0002
	Other/unknown	White	0.81	0.74	0.88	<0.0001	0.81	0.74	0.88	<0.0001
Practice setting										
	Rural	Urban	0.81	0.73	0.88	<0.0001	0.84	0.76	0.92	0.0003
Practice size										
	Small	Large	1.06	0.93	1.21	0.3569	1.01	0.88	1.15	0.9201
	Medium	Large	0.84	0.73	0.96	0.0129	0.87	0.76	1.00	0.0537

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Variable	Level	Reference	Model 1				Model 2			
			HR	95% CI		P value	HR	95% CI		P value
			Lower	Upper		Lower	Upper			
Covariates – index characteristics, cont.										
Insurance	Medicare	Private	0.87	0.82	0.93	<0.0001	0.85	0.80	0.91	<0.0001
	Medicaid	Private	0.79	0.67	0.91	0.0018	0.74	0.64	0.86	0.0001
	Other/unknown/ no insurance	Private	0.67	0.61	0.74	<0.0001	0.65	0.59	0.72	<0.0001
Smoking	Ever smoker	Nonsmoker	1.09	1.03	1.15	0.0041	1.08	1.02	1.15	0.006
Visual acuity	Worse than 20/20, better than 20/40	20/20 or better	1.23	1.13	1.33	<0.0001	1.19	1.10	1.29	<0.0001
	20/40	20/20 or better	2.62	2.41	2.85	<0.0001	2.39	2.19	2.60	<0.0001
Covariates – ocular conditions during follow-up										
Insulin status	Yes	No					1.51	1.43	1.59	<0.0001
Nonretinal diseases	Cataracts	No					1.11	1.05	1.17	0.0002
	Glaucoma	No					2.05	1.94	2.16	<0.0001
	Neovascular glaucoma	No					1.22	0.93	1.60	0.1569
Retinal diseases	AMD	No					2.27	2.02	2.55	<0.0001
	RVO	No					4.72	4.11	5.41	<0.0001

Variable	Level	Reference	HR	Model 1			Model 2			
				95% CI		P value	95% CI		P value	
				Lower	Upper		Lower	Upper		
Covariates – ocular conditions during follow-up, cont.										
DR-related conditions										
	DME	No					1.85	1.68	2.04	<0.0001
	Vitreous hemorrhage	No					9.27	7.20	11.93	<0.0001
	Retinal detachment	No					2.99	2.59	3.44	<0.0001
DR progression										
	New severe NPDR	No					0.98	0.74	1.29	0.8588
	New PDR	No					1.88	1.68	2.12	<0.0001
Fellow eye DR status										
	DR	No					1.14	0.97	1.34	0.122
	Severe NPDR	No					1.21	0.59	2.49	0.5974
	PDR	No					1.48	1.09	2.01	0.0114

AMD, age-related macular degeneration; DME, diabetic macular edema; DR, diabetic retinopathy; HR, hazard ratio; NPDR, nonproliferative diabetic retinopathy; PDR, proliferative diabetic retinopathy; RVO, retinal vein occlusion.

Model 1 adjusted for index characteristics only and model 2 adjusted for index characteristics as well as ocular conditions developed during follow-up. Patients were followed from index date (DR diagnosis) until the date of the event (sustained blindness; date of first blind visual acuity reading 20/200 or worse) or the date of the last visual acuity reading (censoring

event). Adjusted HRs and 95% CIs assessing the impact of index characteristics and development of ocular conditions during follow-up on development of sustained blindness. Values calculated using a discrete-time interval Cox proportional hazards regression model with time-invariant and time-varying covariates. Time-varying covariates were handled as carry-forward indicator variables (once patients become exposed, they were regarded as exposed from that point forward regardless of actual exposure status at each quarterly assessment).