

Diabetic Retinopathy Screening in Hong Kong



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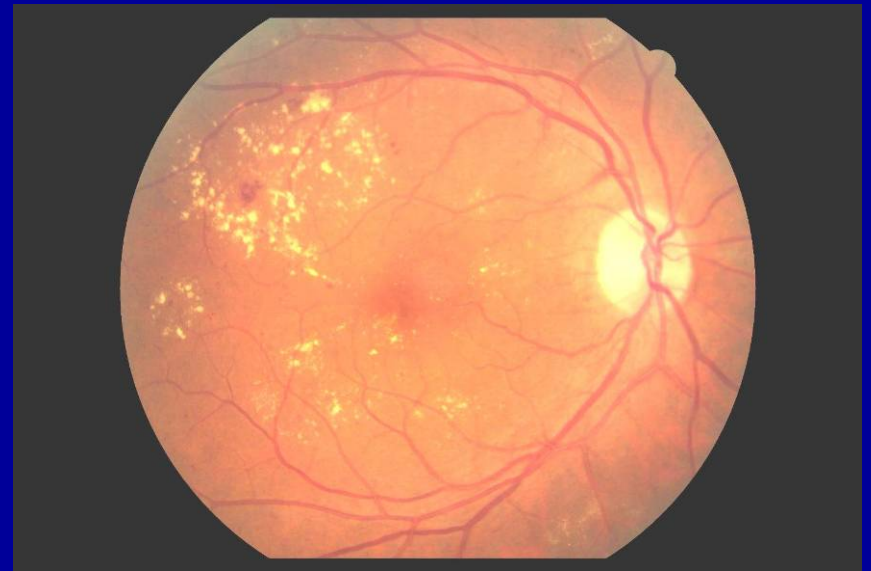
Co-Investigators

- Prof. David Wong
- Prof. Sarah McGhee
- Dr. Wico Lai
- Dr. Daniel Chu
- Dr. Maurice Yap
- Dr. Wendy Tse
- Dr. Daisy Dai
- Dr. Welchie Ko
- Rita Sum



Diabetic Retinopathy

- Diabetic Retinopathy is a leading cause of blindness in individuals < 65 years of age
- Can be totally asymptomatic until there is significant visual loss
- Blindness can be prevented by timely laser treatment



Diabetic Retinopathy Screening

- Public health service - to identify individuals affected by disease or at risk
- Undergo tests or treatment to reduce risk of the disease or complications
- There has been no systematic screening for diabetic retinopathy (DR) in Hong Kong

Inverse care law

- Julian Tudor Hart (30 years ago) (Lancet)
- **perverse relationship between the need for health care and its actual utilization**
- **i.e. those who most need medical care are least likely to receive it**
- Conversely, those with least need of health care tend to use health services more (and more effectively).

Objectives:

- Introduce effective and cost-effective screening programme to screen naïve patients with diabetes mellitus (DM) for retinopathy.
- To refer appropriate patients to SOPD (Ophthalmology &/or General medicine) and administer early treatment to prevent visual loss.
- To see whether paying a fee deterred patients from attending the screening programme.

Diabetic Retinopathy Screening

- A randomized controlled trial
- Phone-contacted 4619 patients with DM
- HK West cluster
- Two groups :



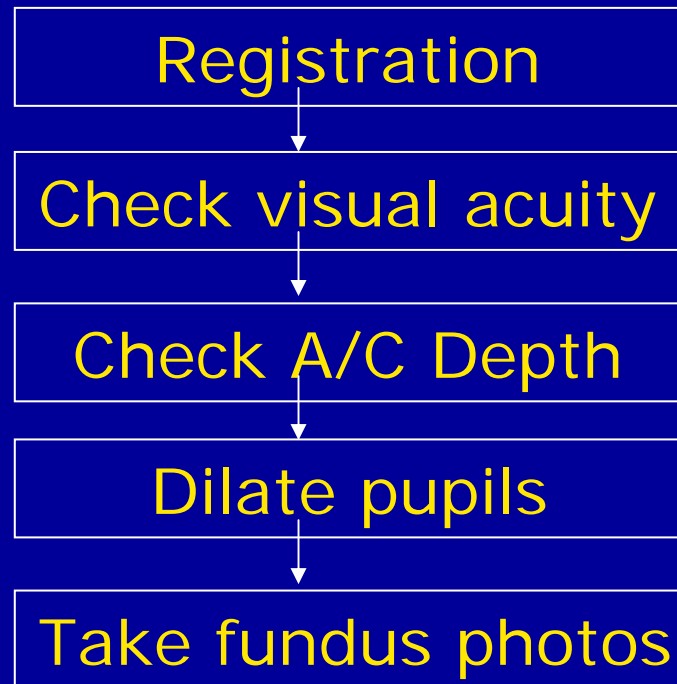
‘PAY group’
(a fee of \$ 60.00)

‘FREE group’
(not required to pay any fees)

All patients underwent screening test and stereoscopic fundus photography.

DR Study – Flow Chart (in Aberdeen clinic)

The screening process:



The Screening Process

1. Registration

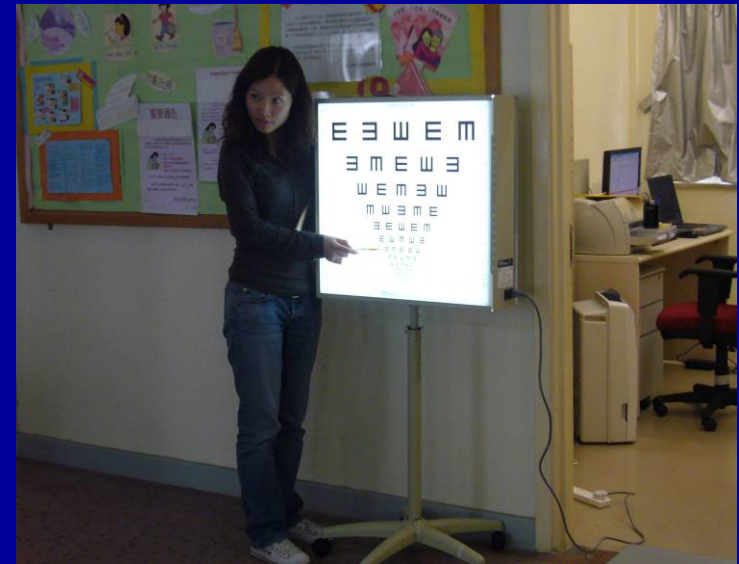
- explaining the consent forms
- collecting the payments
- issuing the receipts



The Screening Process

2. To check patients' visual acuities

- ETDRS chart
- pinhole vision



The Screening Process

3. To check patients' A/C Depths & apply dilation eye drops
 - no drops are applied if patients' angles are narrow

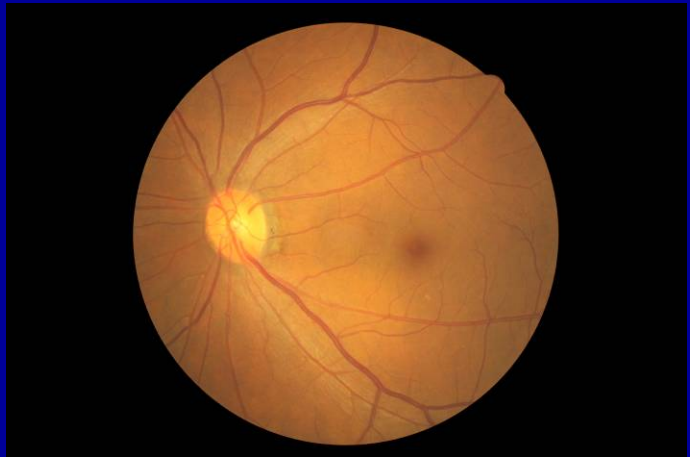
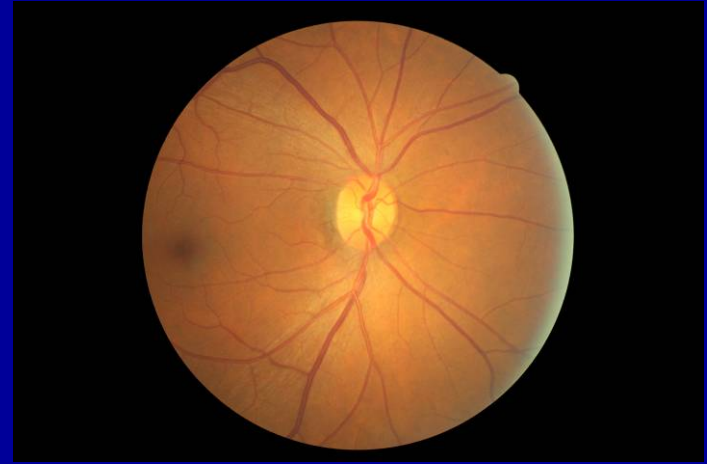


The Screening Process

4. Taking fundus photographs
 - 2 fields in each eye (macula & optic disc)

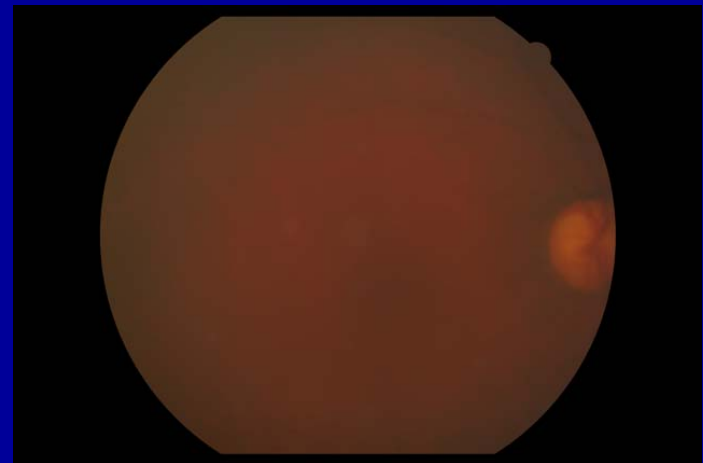


The Screening Process



Grading Protocol

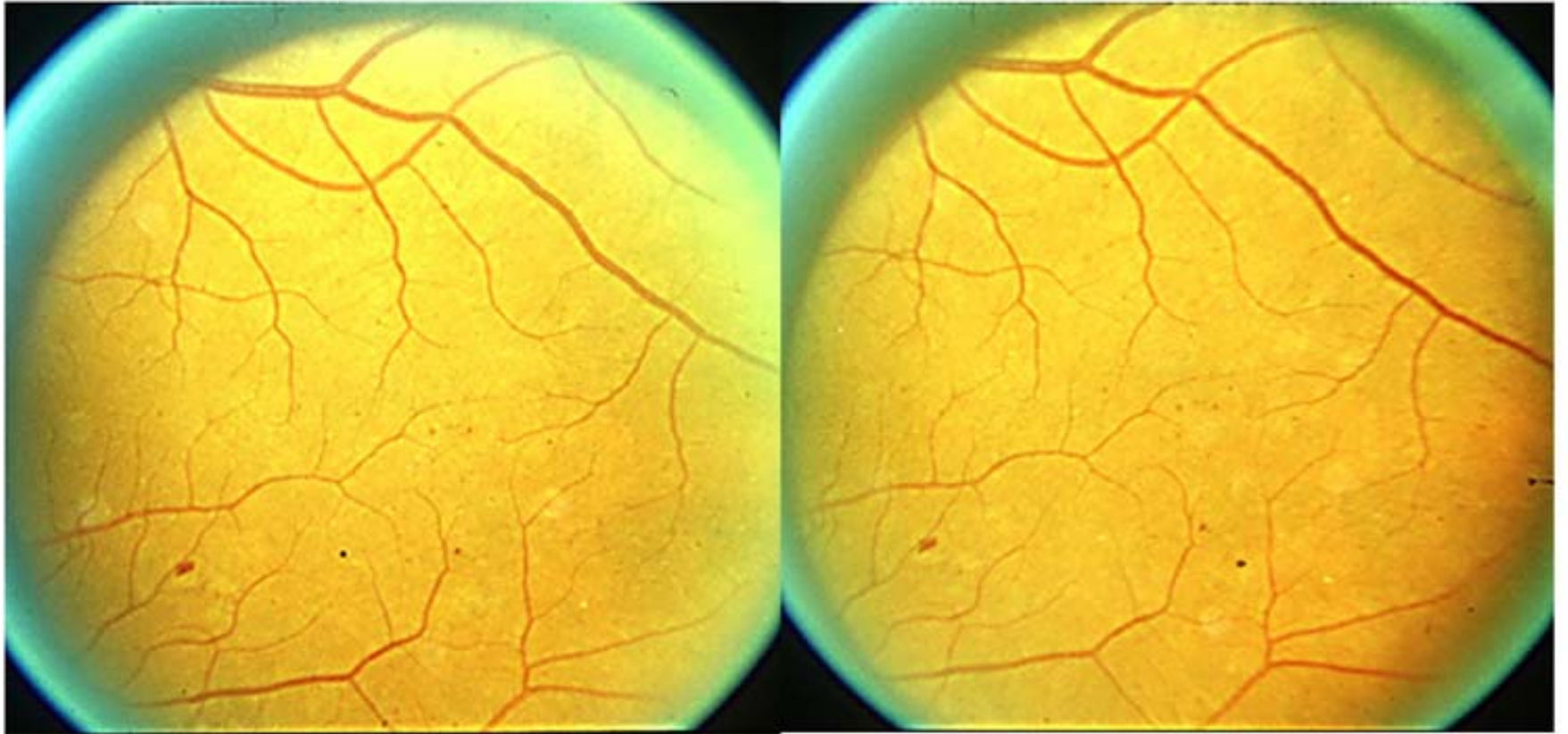
- Image Quality
- Artifacts
- Severity of the disease
- Other eye diseases
- Arbitration
- Quality Assurance



Diabetic Retinopathy Grading Standard

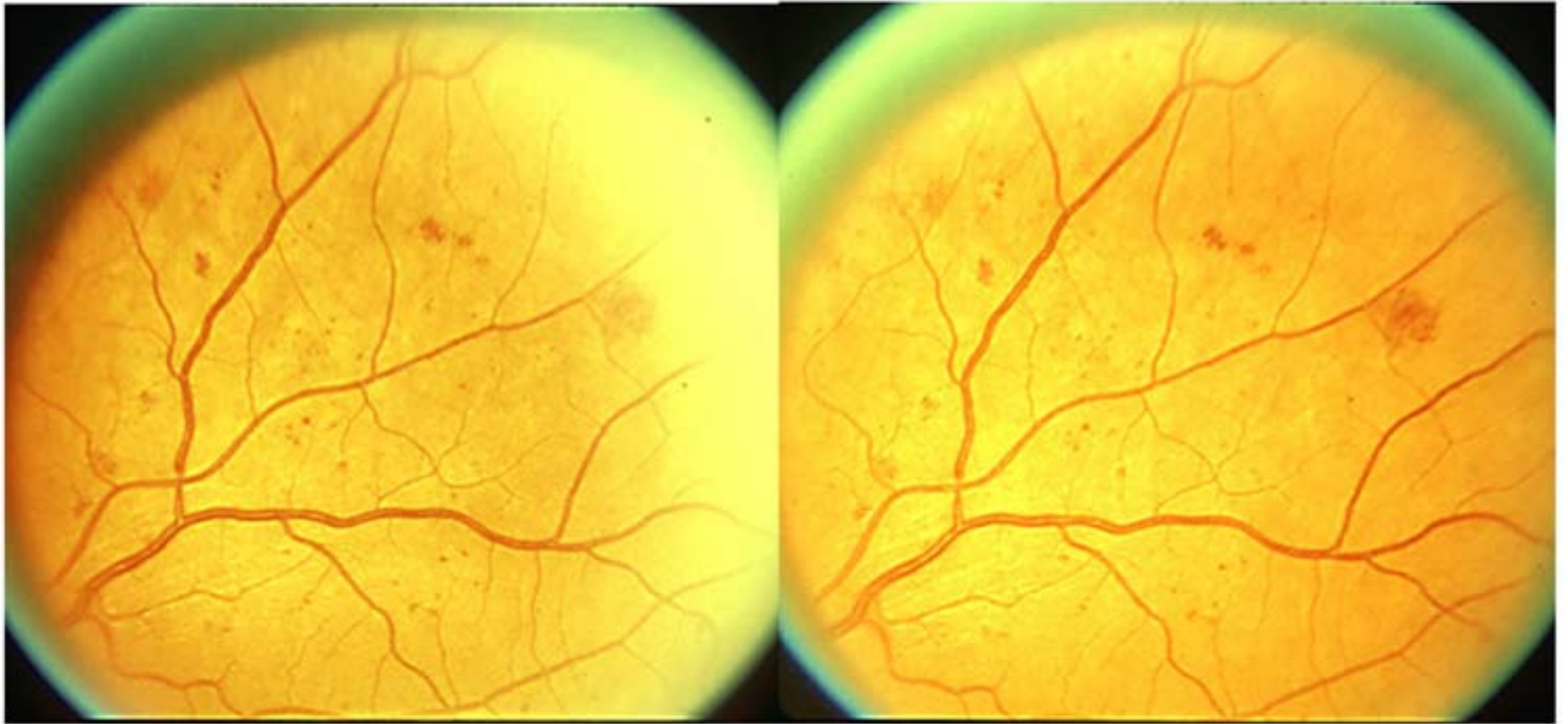
Grade	International Term	Features	Action
R0	No diabetic retinopathy	Normal retina	Annual screening
R1	Mild non-proliferative diabetic retinopathy	Hemorrhages and micro aneurysms only	Annual screening
R2	Moderate non-proliferative diabetic retinopathy	Extensive micro aneurysms (MAs), intraretinal hemorrhages, and hard exudates	Appt within 13 weeks
R2	Severe non-proliferative diabetic retinopathy	Venous abnormalities, large blot hemorrhages, cotton wool spots (small infarcts), venous beading, venous loop, venous reduplication, and IRMA	Appt within 13 weeks
R3	Proliferative diabetic retinopathy	New vessel formation either at the disc (NVD) or elsewhere (NVE).	Appt within 2 weeks
R3	Pre-retinal fibrosis ± tractional retinal detachment	Extensive fibro vascular proliferation, retinal detachment, pre-retinal or vitreous hemorrhage, glaucoma and subhyaloid hemorrhage	Appt within 2 weeks
M0	No maculopathy	No maculopathy	Annual screening
M1	Maculopathy	Exudative : leakage, retinal thickening, MAs,HEs Ischemic : featureless macula with NVE and poor VA Milder forms: <ul style="list-style-type: none"> ●exudate ≤1DD of centre of fovea ●circinate or group of exudates within macula ●any MAs or hemorrhage ≤1DD of centre of fovea only if associated with a best VA of ≤ 6/12 ●retinal thickening ≤1DD of centre of fovea 	Appt within 13 weeks
P	Photocoagulation	Small retinal scars through out the peripheral retina.	Appt < 2 weeks
U	Un-gradable	Ungradable : cataract or other lesions -referred for assessment	Appt < 4 weeks

Standard Photo 1



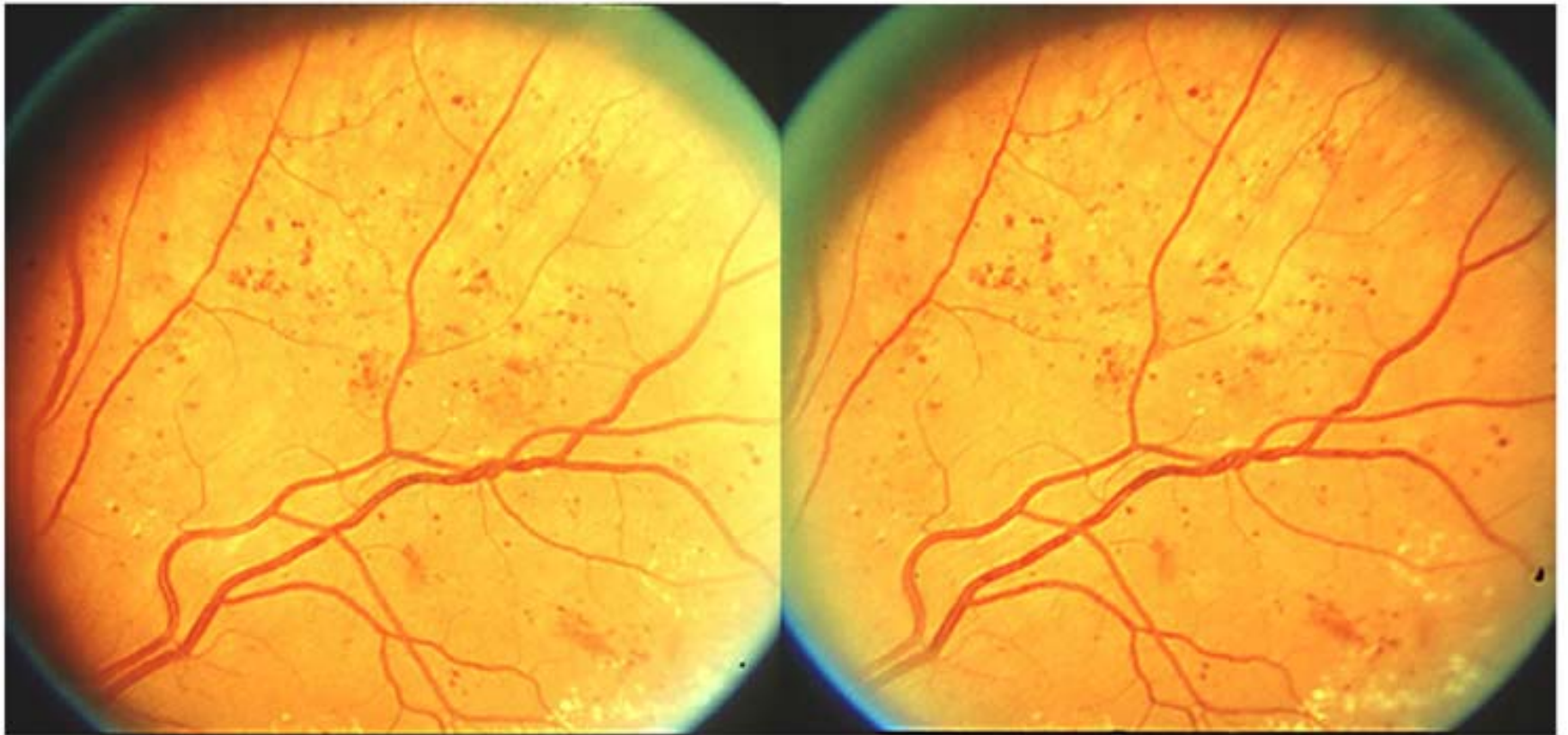
R1 - Mild non-proliferative diabetic retinopathy

Standard Photo 2A



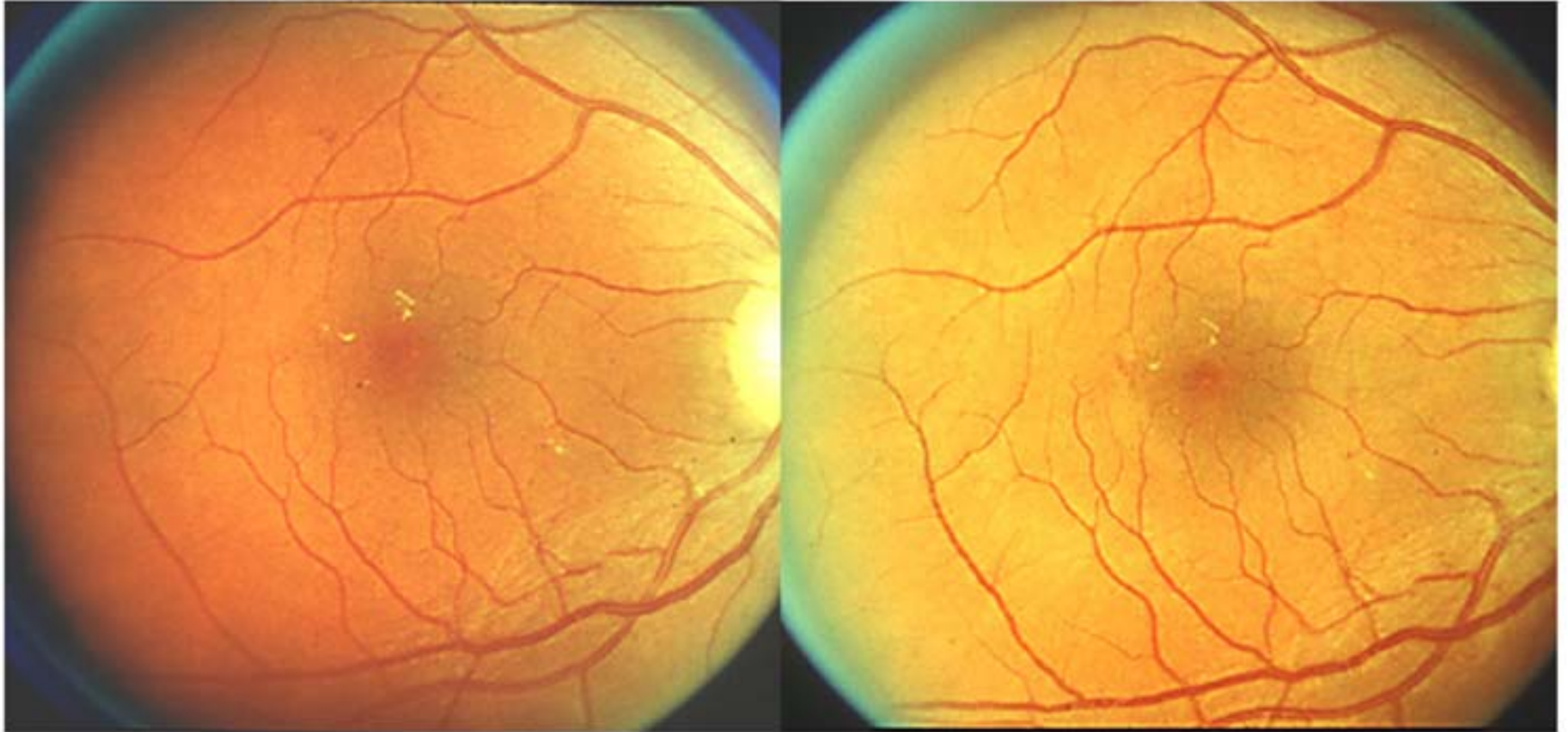
R2 - Moderate non-proliferative diabetic retinopathy

Standard Photo 2B



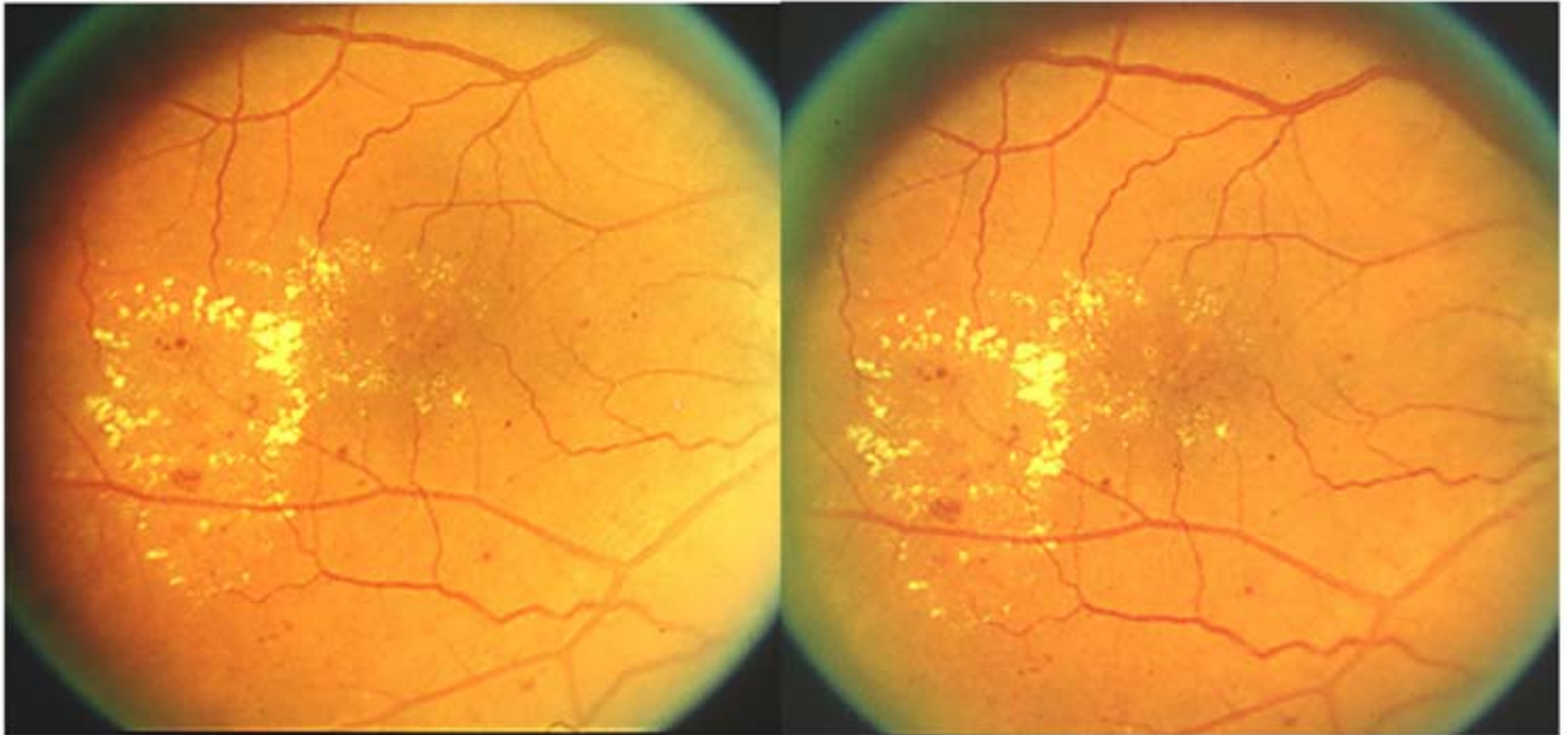
R2- Severe non-proliferative diabetic retinopathy

Standard Photo 3



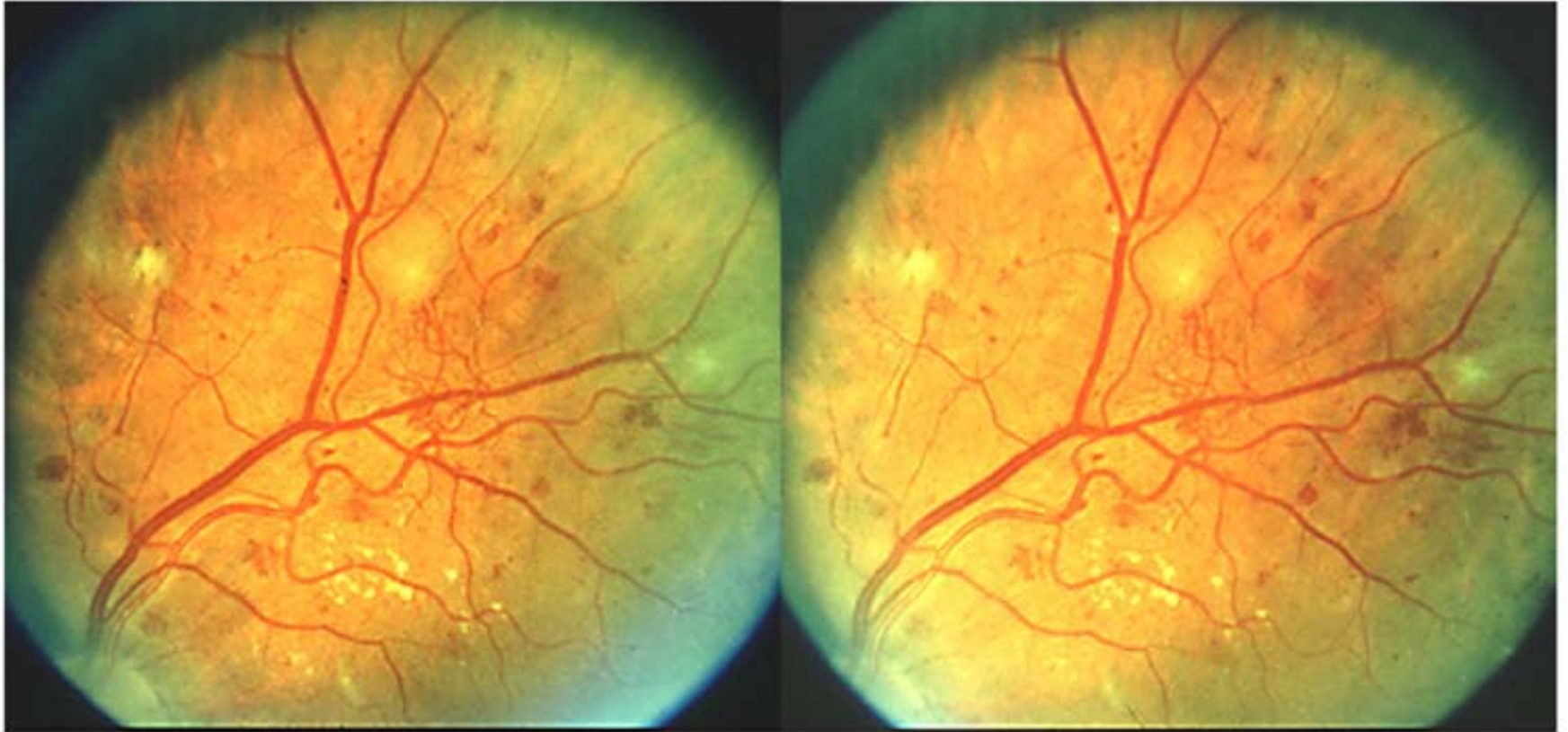
M1- Diabetic maculopathy

Standard Photo 4



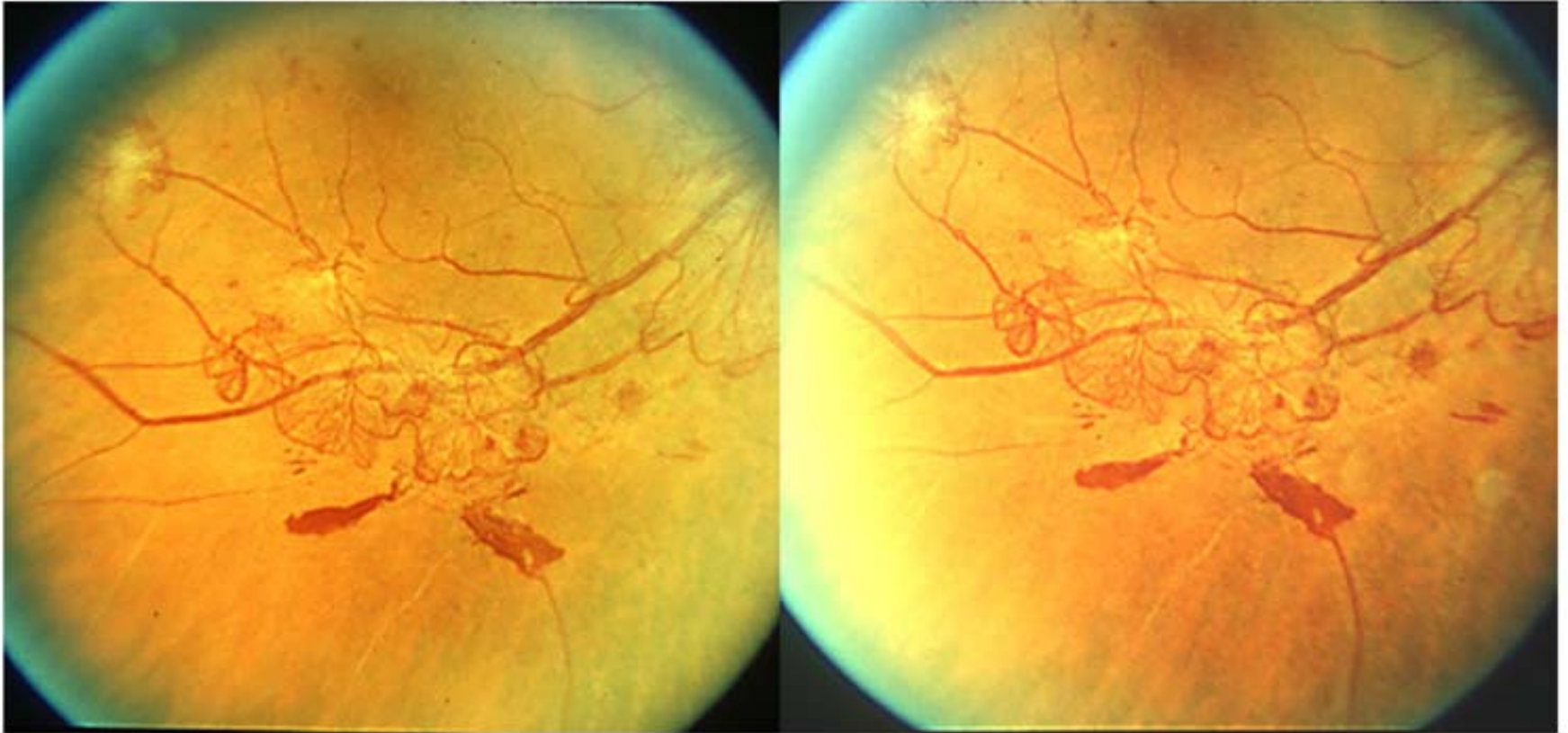
M1- Diabetic maculopathy

Standard Photo 5



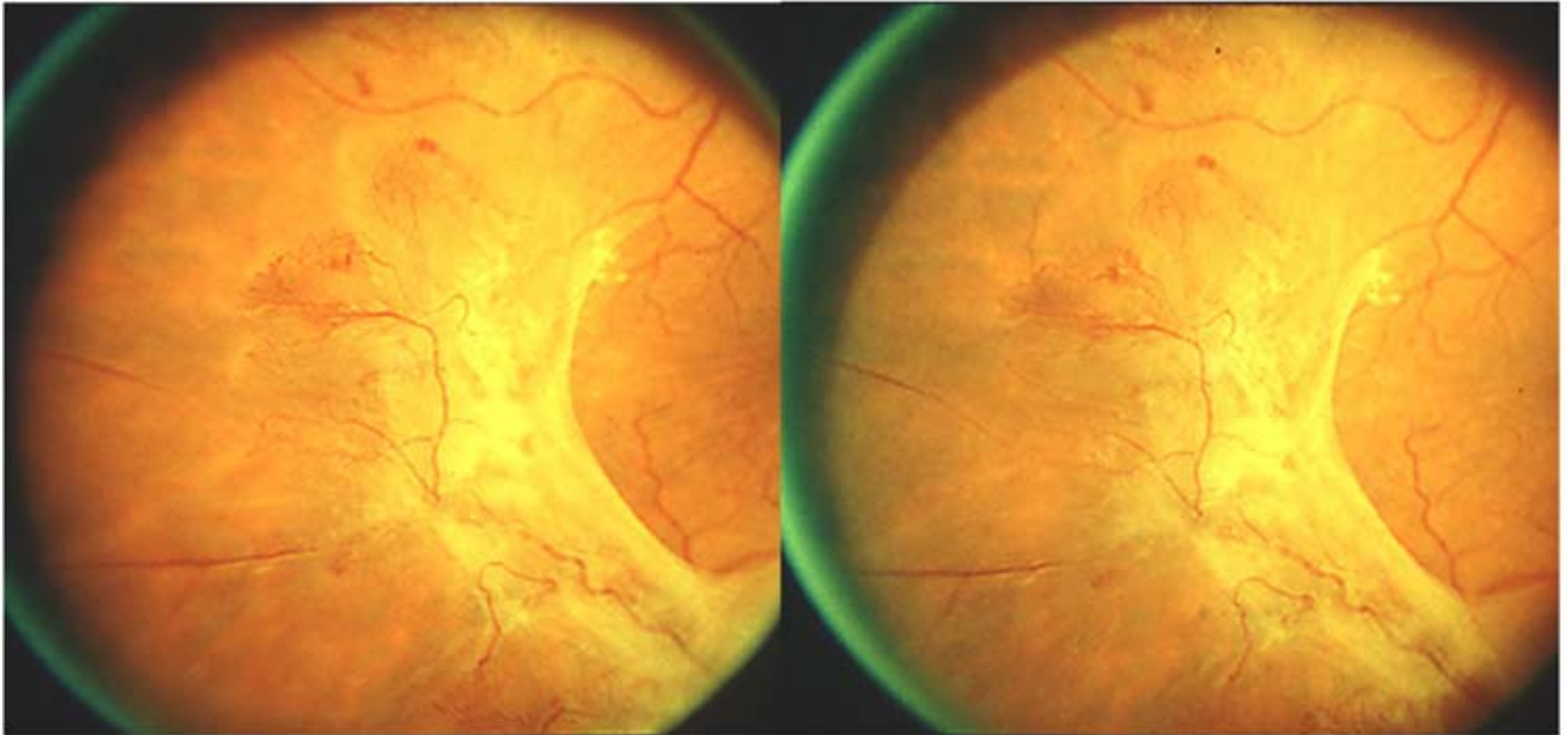
R3- Proliferative diabetic retinopathy

Standard Photo 7



R3- Proliferative diabetic retinopathy

Standard Photo 12



R3- Pre-retinal fibrosis \pm tractional retinal detachment

Screening results:

Total no. of patients screened = 2221

Level of Retinopathy	Total	%
R0	1489	67.71%
R1	368	16.57%
R0 or R1, M	54	2.43%
R2	24	1.08%
R2, M	23	1.04%
R3	2	0.09%
U	248	11.17%
P	4	0.18%
Any Retinopathy	475	21.38%
Total	2221	100.00%

Overall results

- One in 5 patients has some retinopathy
- One in 20 patients has SIGHT
THREATENING diabetic retinopathy

Outcome

- Out of the 2221 patients screened, 475 (21%) were referred to hospitals, some to general ophthalmology clinic and some to retinal clinic

Is there a difference between free group and the pay group?

Screening results:

	FREE group	PAY group	Total
• Total no. of phone calls	2312	2307	4619
• No. of patients who took part in study	1300	1259	2559
• % of patients who accepted invitation	94.6%	90.9%	
• % of patients who showed up	93.3%	90.1%	
• Response rate	88.3%	82.0%	

Screening results:

Level of Retinopathy	Free Group	%	Pay Group	%	Total	%
R0	740	63.41%	749	71.06%	1489	67.71%
R0, M**	2	0.17%	7	0.66%	9	0.41%
R1	212	18.17%	156	14.80%	368	16.57%
R1, M**	31	2.66%	14	1.33%	45	2.17%
R2	14	1.20%	10	0.95%	24	1.08%
R2, M**	13	1.11%	10	0.95%	23	1.04%
R3	1	0.09%	1	0.09%	2	0.09%
U*	147	12.60%	101	9.58%	248	11.17%
U*,M**	5	0.43%	4	0.38%	9	0.41%
P***	2	0.17%	2	0.19%	4	0.18%
Total	1167	100%	1054	100%	2221	100%

Screening results:

	FREE group	PAY group	Difference (95% Confidence Interval)
• R0 retinopathy	69.2%	75.8%	6.6% (2.8-10.3%)
• R1 retinopathy	20.2%	15.7%	4.5% (1.2-7.7%)
• No. of patients who needed referral	5.9%	4.9%	1.0%(- 1.0-2.9%)

Summary

1. More patients in free group turned up for screening
2. Pay group has more patients with no retinopathy
3. Tendency of free group to have higher levels of retinopathy, therefore
'Inverse care law' seemed to apply

Acknowledgement

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香港大學
THE UNIVERSITY OF HONG KONG

Thank You