

On behalf of Vision Expo, we sincerely thank you for being with us this year.

**Reminder to Complete Your Session Evaluations!**

Please be sure to complete your digital session evaluations for each course you attended! Your feedback is important to us as our Education Planning Committee considers content and speakers for future meetings to provide you with the best education possible.



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disclosures

last 12 months	last 12 months	last 12 months
allergan/abbvie sun pharma tarsus pharma Ocuphire Bruder Scope	sydnexis eyenovia bio laboratoires Thea visus/tenpoint therapeutics Harrow	aperta biosciences astareal, inc. azura ophthalmics aldehyra therapeutics Vyluma Lenz

\*All relevant relationships have been mitigated.\*

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Update on Managing Presbyopia Without Corrective Lenses

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500

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Update on Managing Presbyopia Without Corrective Lenses

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Update on Managing Presbyopia Without Corrective Lenses



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By 2030, 2.1 billion people will have presbyopia.  
Yet most still only get readers

Fricke TR, Tahhan N, Resnikoff S, Papas E, Burnett A, Ho SM, Naduvilath T, Naidoo KS. Global Prevalence of Presbyopia and Vision Impairment from Uncorrected Presbyopia: Systematic Review, Meta-analysis, and Modelling. Ophthalmology. 2018 Oct;125(10):1492-1499.

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Presbyopia

What is your first choice treatment for presbyopia?

1. Drops
2. Anything but drops

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Presbyopia

What is the #1 barrier for presbyopia drops? (Choose One)

1. Cost
2. Safety
3. Duration
4. Patient and/or Doctor skepticism

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Presbyopia

Have you prescribed presbyopia drops?

1. Yes
2. No

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# Basics

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**Q:** We live in a 3D world. We only have a 2D retina. How can we perceive different distances?

**A:** Accommodation

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**THE NEAR TRIAD**

1. Accommodation
2. Convergence
3. Miosis

BHOLA RAHLL (23 JANUARY 2008). "EYEROUNDS.ORG TUTORIAL BINOCULAR VISION". WEBEYE.OPHTH.UOWA.EDU. UNIVERSITY OF IOWA. RETRIEVED 11 SEPTEMBER 2020. [HTTPS://WWW.BOULDERDIV.COM/VP-CONTENT/UPLOADS/SITES/4/2021/03/THE-NEAR-TRIAD.PDF](https://www.boulderdiv.com/wp-content/uploads/sites/4/2021/03/THE-NEAR-TRIAD.PDF)

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**LENS**

**Protein homeostasis: live long, won't prosper**  
 Brandon M. Toyama and Martin W. Heter  
 Salk Institute for Biological Studies, Molecular and Cell Biology Laboratory, 10310 N. Torrey Pines Road, La Jolla, CA 92037 USA

**Abstract**  
 Protein turnover is an effective way of maintaining a functional proteome, as old and potentially damaged polypeptides are destroyed and replaced by newly synthesized copies. An increasing number of intracellular proteins, however, have been identified that evade this turnover process and instead are maintained over a cell's lifetime. This diverse group of long-lived proteins might be particularly prone to accumulation of damage and thus play a critical role in the functional deterioration of key regulatory processes during aging.

Toyama BM, Heter MW. "Protein Homeostasis: Live Long, Won't Prosper." *Nature Reviews Molecular Cell Biology* 14:1 (2013): 55-61.

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Heat added →

Water soluble Protein → Denatured Protein

Orderly crystallin → Unfolded crystallin

Transparent lens → Opaque lens

Aging/Heat →

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**PRESBYOPIA AND HEAT**

Mishra MR (1979) The geographic factor in the onset of presbyopia. *Trans Am Ophthalmol Soc* 77: 602-621

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# Drugs

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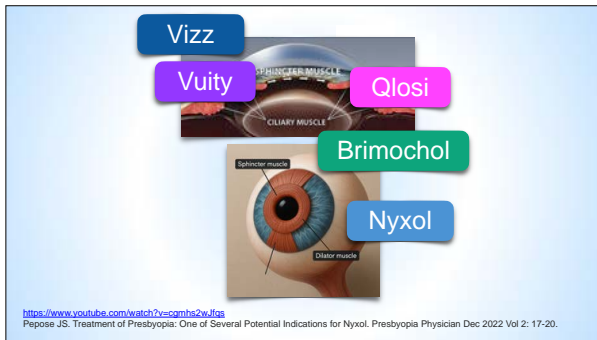
Company	Drug	Brand	Approved	Mechanism of Action
Allergan/AbbVie	Pilocarpine 1.25% BID	Vuity	Yes	Iris sphincter+Ciliary muscle
Orasis	Pilocarpine 0.4% BID	Qlosi	Yes	Iris sphincter+Ciliary muscle
Lenz	Acetidine 1.75%	Vizz	Yes	Selective Iris sphincter+Ciliary muscle
Tenpoint	Brimonidine 0.1% Carbachol 2.75%	Brimochol	No	Iris sphincter+Ciliary muscle+ Blocks dilator
Viatrix	Phentolamine 0.75%	Nyxo1 (?)	No	Blocks dilator

<https://www.viatrix.com/news-releases/news-release-details/viatrix-announces-positive-top-line-results-second-phase-McLube-CLM>. An update on Brimonidol PF. Presbyopia Physician Ophthalmology Management vol 28 April 2024.  
 Lenx Pharmaceuticals Corporate presentation May 2023 [https://www.lenx.com/~/media/lenx/ppt/2023/05/20230516\\_Lenx\\_Presentation\\_May2023.pdf](https://www.lenx.com/~/media/lenx/ppt/2023/05/20230516_Lenx_Presentation_May2023.pdf)  
 Hahnel S, Genskiel D, Pignatelli B, Schaeffer J, Green P, Poon N, Green G, Ignace J, Lindner B. Efficacy and Safety of ODF1 (Pilo) Phosphate Hydrochloride in Presbyopia: Final Results of the ODF1 Phase 3 Randomized Clinical Trial. *Am Ther* 2024 Feb;46(2):104-113.  
 Heter MW, Toyama BM, Wang J, Winkler M, Gao Q, Gao A, Liu H, Saffari E, Robinson MR. Safety and Efficacy of AQN-100564 in Individuals With Presbyopia: The GEMM1 Phase 3 Randomized Clinical Trial. *JAMA Ophthalmol* 2022 Sep;140(9):1041-1051.  
 Gorman S, Di Napoli SM, Mocharra M, Luviana C, Kim JI, Paez JJ, Saffari E, Liu H, Zhang S, Robinson MR. Safety and Efficacy of Twice-Daily Pilocarpine HCI in Presbyopia: The Vigeo Phase 3, Randomized, Double-Masked, Controlled Study. *Am J Ophthalmol* 2023 Sep;253:189-206.

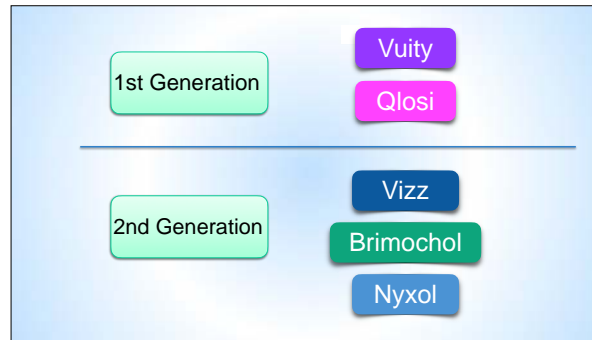
17

<https://www.youtube.com/watch?v=cgmb2wJlfn0>  
 Pepose JS. Treatment of Presbyopia: One of Several Potential Indications for Nyxo1. *Presbyopia Physician* Dec 2022 Vol 2: 17-20.

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Data Wars

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Day 30, Day 8 or Day Whatever?  
 8 hours, 3 hours, 30 minutes or 10 hours?  
 Binocular or monocular or both?

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Company	Drug	Hour	Improvement	Day
Allergan/AbbVie	Pilocarpine 1.25% qD	3hrs	31% vs. 8%	Day 30
Allergan/AbbVie	Pilocarpine 1.25% BID	9hrs	35.1% vs. 7.8%	Day 14
Orasis	Pilocarpine 0.4% BID	8hrs	35.5% vs. 19.1%	Day 15
Lenz	Aceclidine 1.75%	10hrs	40% vs. 5%	Day 1
Tenpoint	Brimonidine 0.1% Carbachol 2.75%	10hrs	35% vs. 7%	Day 28
Viatrix	Phentolamine 0.75%	12hrs	"Significantly more"	Day 8

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Case: Emmetrope

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Emmetrope  
 Changing scenario case: Maria  
 50 year old female  
 Emmetrope  
 Does not want readers

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Company	Drug	Brand	Approved	Mechanism of Action
Allergan/AbbVie	Pilocarpine 1.25% BID	Vuity	Yes	Iris sphincter+Ciliary muscle
Orasis	Pilocarpine 0.4% BID	Qlosi	Yes	Iris sphincter+Ciliary muscle
Lenz	Aceclidine 1.75%	Vizz	Yes	Selective Iris sphincter+Ciliary muscle
Tenpoint	Brimonidine 0.1% Carbachol 2.75%	Brimochol	No	Iris sphincter+Ciliary muscle+ Blocks dilator
Viatrix	Phentolamine 0.75%	Nyxol (?)	No	Blocks dilator

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## Emmetrope

“emmetropes are at the top of the list for these drops”

Hom M. Patient selection and the X factor. Presbyopia Physician March 2023  
 Karpecki P, McGee S, Singh RP. Pinning down presbyopia. Review of Optometry Suppl June 30 2025

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What?

Emmetrope needs readers

So what?

Emmetrope hates readers

Now what?

Take your pick of the drops; they all work

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Case: Duration

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## Pupil

Changing scenario case: Maria  
 50 year old female  
 Air traffic control  
 On call long hours screens  
 Using 1st G drop; doesn't last

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Company	Drug	Hour	Improvement	Day
Allergan/AbbVie	Pilocarpine 1.25% qD	3hrs	31% vs. 8%	Day 30
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Lenz	Acetidine 1.75%	10hrs	35% vs. 7%	Day 28
Tenpoint	Brimonidine 0.1% Carbachol 2.75%	10hrs	49.1% vs. ??	Day 8?
Viatrix	Phentolamine 0.75%	12hrs	"Significantly more"	Day 8

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## Miosis

“These Phase 3 studies demonstrated that twice-a-day dosing, with 2 to 3-hour intervals between doses, produced a statistically significant improvement in DCNVA [near vision] without compromising CDVA [distance vision]”

Holland E, Karpecki P, Fingeret M, Schaeffer J, Gupta P, Fram N, Smits G, Ignacio T, Lindstrom R. Efficacy and Safety of CSF-1 (0.4% Pilocarpine Hydrochloride) in Presbyopia: Pooled Results of the NEAR Phase 3 Randomized, Clinical Trials. Clin Ther. 2024 Feb;46(2):104-113.

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What?

Works long hours on screens

So what?

Wants longer duration

Now what?

Use/Switch to 2nd G drop  
 Increase 1st G to BID

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Case: Pupils

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## Pupil

Changing scenario case: Maria  
 50 year old female  
 8mm pupils  
 Poor near vision with 1st G drop (Pilo)

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## Neuroadaptation

Changing scenario case: Maria  
50 year old female  
Using 1st G drop for a few days  
Computer vision adequate; near  
vision almost there  
Wished she could see better

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## Neuroadaptation

## Neuroadaptation

“the circuitry that is in place is not sufficient to deal with this new challenge. New circuitry has to be laid down.”

Pat Phillips. New Lens, Same Brain: The Importance of Neuroadaptation EyeNet Magazine July 01, 2007

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## Neuroadaptation

“neuroadaptation is the process by which the necessary neurocircuitry is put in place”

Pat Phillips. New Lens, Same Brain: The Importance of Neuroadaptation EyeNet Magazine July 01, 2007

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## Neuroadaptation

“the drop clarifies—not magnifies—images..the brain is quite plastic and able to interpret new images, it needs time to adapt.”

Lievens C, McGee S, Micheletti M, Zhang Z, Schachter S. Increased depth of focus from pilocarpine HCl ophthalmic solution 1.25% in mild and moderate presbyopia. Invest Ophthalmol Vis Sci. 2023;64(8):2509.

Holland E, Karpecki P, Fingeret M, et al. Efficacy and safety of CSF-1 (0.4% pilocarpine hydrochloride) in presbyopia: pooled results of the NEAR phase 3 randomized, clinical trials. Clin Ther. 2024;46(2):104-113.

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## Neuroadaptation

“ DOF [Depth of Field] increased until at least day 14, while the reduction in pupil diameter was stable”

Lievens C, McGee S, Micheletti M, Zhang Z, Schachter S. Increased depth of focus from pilocarpine HCl ophthalmic solution 1.25% in mild and moderate presbyopia. Invest Ophthalmol Vis Sci. 2023;64(8):2509.

Holland E, Karpecki P, Fingeret M, et al. Efficacy and safety of CSF-1 (0.4% pilocarpine hydrochloride) in presbyopia: pooled results of the NEAR phase 3 randomized, clinical trials. Clin Ther. 2024;46(2):104-113.

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“routine use enables faster neuroadaptation compared with as-needed use”

“Try daily use for the first 7 days, as neuroadaptation and side effects get better with use”

“use the medication once daily for the first 2 weeks”

Lang J. Tips on using Vuity. Presbyopia Physician Mar 2022  
Karpecki P, McGee S, Singh RP. Pinning down presbyopia. Review of Optometry Suppl June 30 2025  
Lievens C, McGee S, Micheletti M, Zhang Z, Schachter S. Increased depth of focus from pilocarpine HCl ophthalmic solution 1.25% in mild and moderate presbyopia. Invest Ophthalmol Vis Sci. 2023;64(8):2509.  
Holland E, Karpecki P, Fingeret M, et al. Efficacy and safety of CSF-1 (0.4% pilocarpine hydrochloride) in presbyopia: pooled results of the NEAR phase 3 randomized, clinical trials. Clin Ther. 2024;46(2):104-113.

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What?

Vision OK, wishes it was better

So what?

Only using for a few days/intermittent use

Now what?

Use drops every day consistently for 2 weeks

Encourage adherence vs switching too early.

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Case: Shift

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## Vuity

3 cases of retinal detachment in 2 patients:  
47 year old male  
Flashes floaters after 3 days  
Retinal detachment and retinal tear both eyes

46 year old male  
5 weeks  
Retinal detachment and sub retinal fluid into macula

Al-Khersan, Hasenin, Harry W. Flynn Jr, and Justin H. Townsend. "Retinal Detachments Associated with Topical Pilocarpine Use for Presbyopia: Pilocarpine-Associated Retinal Detachments." *American Journal of Ophthalmology* (2022).

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## Vuity

2 cases:  
60-70 year old pseudophakic males  
10 days retinal detachment one eye  
High myopia  
Lattice degeneration  
Prior retinal detachment

Eton, Emily A., et al. "Rhegmatogenous Retinal Detachment Following Initiation of Pilocarpine Hydrochloride Ophthalmic Solution 1.25% for Treatment of Presbyopia." *Retinal Cases and Brief Reports* (2022): 10-1097.

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## FDA Adverse Events Reporting System (FAERS) Public Dashboard

424 cases in 2022:  
Headache (106) 25%  
Drug ineffective (99) 23.5%  
Retinal detachment (29) 6.84%  
Vitreous floaters (29) 6.84%  
Vitreous detachment (24) 5.66%

<https://fis.fda.gov/sense/app/95239e26-e0be-42d9-a960-9a5771c25ee/sheet/45beeb74-30ab-46be-8267-5756582633b4/state/analysis>

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## My Vuity Story



<https://www.myrdstory.com/blog/my-vuity-story>

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## New Labeling

## Vuity

- WARNINGS AND PRECAUTIONS-----
- **Blurred Vision:** Patients should be advised not to drive or operate machinery if vision is not clear (e.g., blurred vision). Exercise caution in night driving and other hazardous activities in poor illumination. (5.1)
  - **Risk of Retinal Detachment:** Rare cases of retinal detachment and retinal tear have been reported with miotics, including VUITY. Individuals with pre-existing retinal disease are at increased risk. Therefore, examination of the retina is advised in all patients prior to initiation of therapy. Patients should be advised to seek immediate medical care with sudden onset of flashing lights, floaters, or vision loss. (5.2)
  - **Iritis:** Caution is advised in patients with iritis. (5.3)

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## Retinal detachment

"Fewer cases were reported to the FDA... indicating that incidence of RD... decreased after the package insert update"

Karpecki P, McGee S, Singh RP. Pinning down presbyopia. *Review of Optometry Suppl* June 30 2025

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## Retinal detachment

"I will not prescribe...for presbyopia to anyone with more than -6.0 D myopia or whose axial length is > 26 mm."  
-Selina McGee

Karpecki P, McGee S, Singh RP. Pinning down presbyopia. *Review of Optometry Suppl* June 30 2025

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## Myope

Changing scenario case: Maria  
50 year old female  
-6.00 myope  
Family history of retinal detachment  
Retinal exam normal

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### What?

Loves vision; but uncomfortable

### So what?

Using 2nd G drop

### Now what?

Switch to 1st G

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### Tip sheet

- ⌚ Time matters: effect at 15 min, best at 2 weeks;  
1st G Not long enough? try BID or 2nd G
- Pupil matters: Pupil too small: dimming;  
too large: reduced near effect.
- ⚡ Side effects: mild headaches, mostly mild;  
goes away after a few minutes
- ❤ Lifestyle: weekend "date drug" or daily use-customize to patient

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thank you!

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