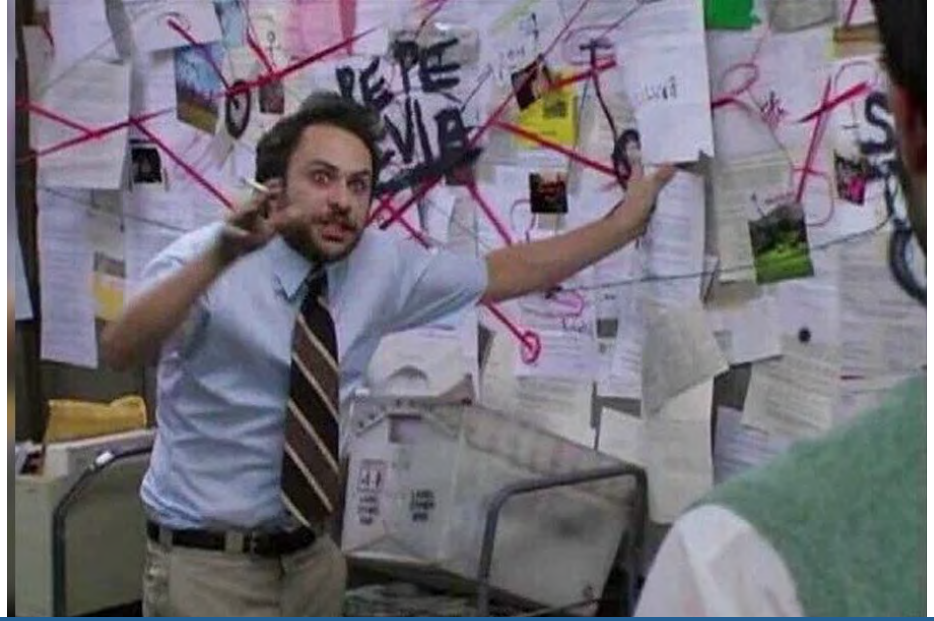


What if They’re Not Crazy? (Learn to Love the Engineer)

Charlie Saccarelli, ABOM

Speaker Financial Disclosure Statement

Charlie Saccarelli is an owner and the president of Chadwick Optical.
He potentially makes money when you buy stuff from Chadwick Optical.
All relevant relationships have been mitigated.

This is Charlie’s Car.

2009 Nissan Versa

DISCLAIMER

- I am an optician presenting information for opticians to help opticians do what opticians do.
- What I am presenting is plenty accurate enough for that specific purpose.
- To many of the things I say, a vision scientist or physics professor might interrupt and say “well technically that’s not entirely correct because blahhhhhhhhhh”
- …that’s why they’re not invited.

ONE MORE THING

- You can take pictures of the slides if you want, but I'd rather you just pretend to pay attention to what I'm saying. It makes me feel so good.

- Email me at cbs@chadwickoptical.com, and I'm happy to share the entire presentation with you. Or text/What's App/whatever me at 267-374-5601

What we'll be discussing

- What is reality?
- Why we shouldn't gaslight patients
- Human perception and the iris-hole
- Three things to be aware of in your journey that will never show up on a refraction.
- Why engineers might seem annoying, but why we should thank them anyways.
- Why YOU should exceed the standard of care.

CHARLIE’S SOAPBOX MOMENT

“As to methods, there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble.”

Methods

Principles

Method vs. Principle-Based Approach to Aniseikonia

RX #1:
OD: +5.00
OS: +2.00

RX #2:
OD: -5.00
OS: -2.00

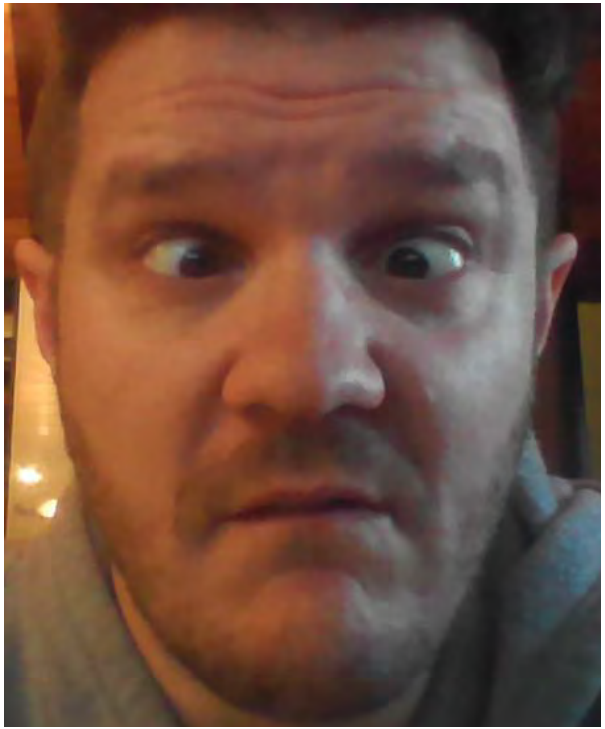
Principle: Equalize Magnification

Method: Match Base Curve and Center Thickness

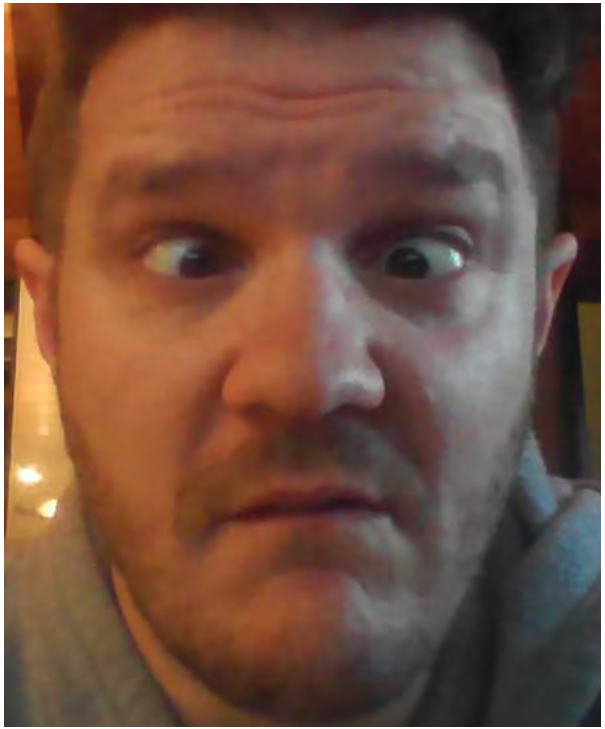
"As to methods, there may be a million and then some, but principles are few. The man who grasps principles can successfully select his own methods. The man who tries methods, ignoring principles, is sure to have trouble."

REALITY

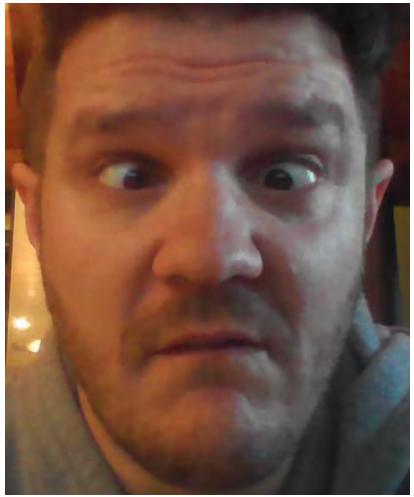
VS.



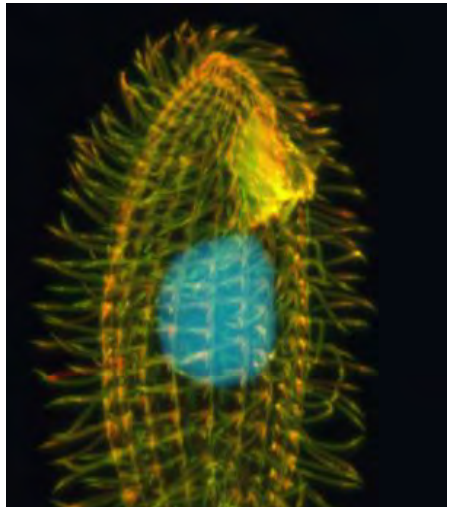
VS.







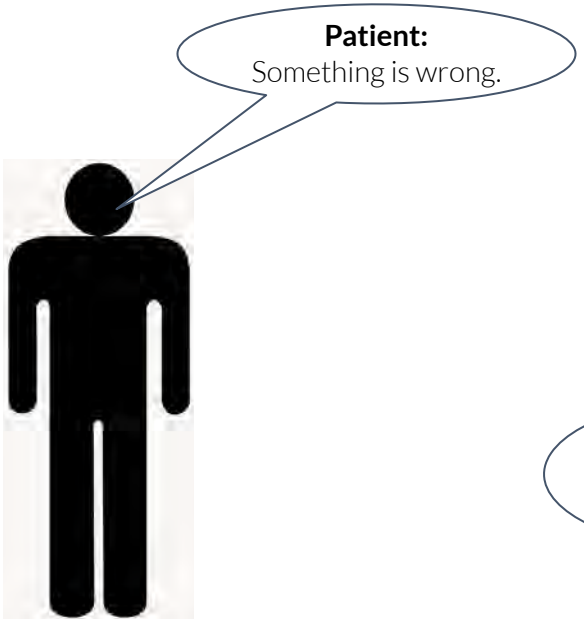


65%+ of our brain contents arrived there through the eyeballs. It's the biggest influence on our reality.

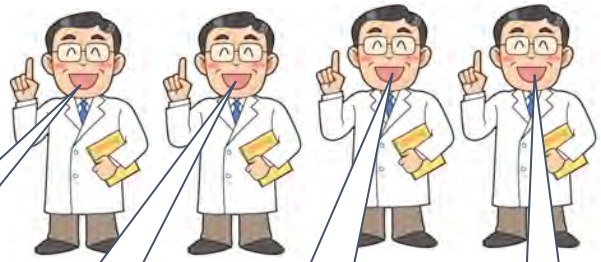
GASLIGHTING

CAMPAIGN AGAINST GASLIGHTING



This will probably be you someday.

PURVEYORS OF THE STANDARD OF CARE



The tests we ran look fine, so YOU must be fine.

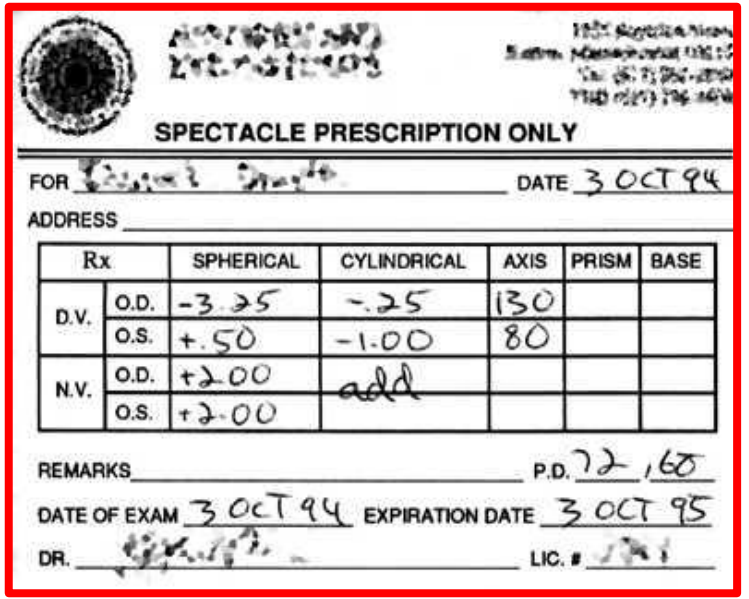
Great news! Your problem has a name! I did my job!

Your refraction is correct, so everything MUST be fine. You can see 20/20. What more do you want?

Your glasses meet ANSI standards, so everything MUST be fine.

Let's Exceed the Standard of Care

- Vision goes far beyond the refraction/diagnosis
- **"Understanding is love's other name"** - Thich Nhat Hanh
- Just keep trying to understand.
  - What is it like to have this condition?
  - What is it like to see through their eyes?
- Know the people in your area who specialize in that stuff so if you can't help them, you can introduce them to someone who can.



SPECTACLE PRESCRIPTION ONLY

FOR [redacted] DATE 3 OCT 94

ADDRESS

Rx		SPHERICAL	CYLINDRICAL	AXIS	PRISM	BASE
D.V.	O.D.	-3.25	-.25	130		
	O.S.	+.50	-1.00	80		
N.V.	O.D.	+2.00	add			
	O.S.	+2.00				

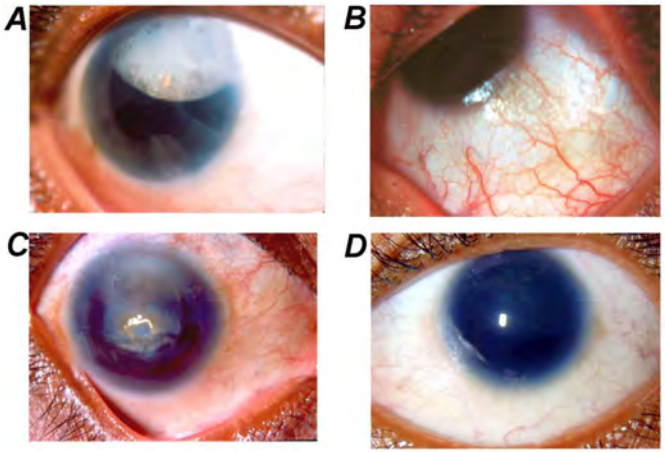
REMARKS P.D. 72, 60

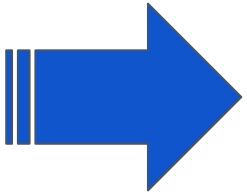
DATE OF EXAM 3 OCT 94 EXPIRATION DATE 3 OCT 95

DR. [redacted] LIC. # [redacted]

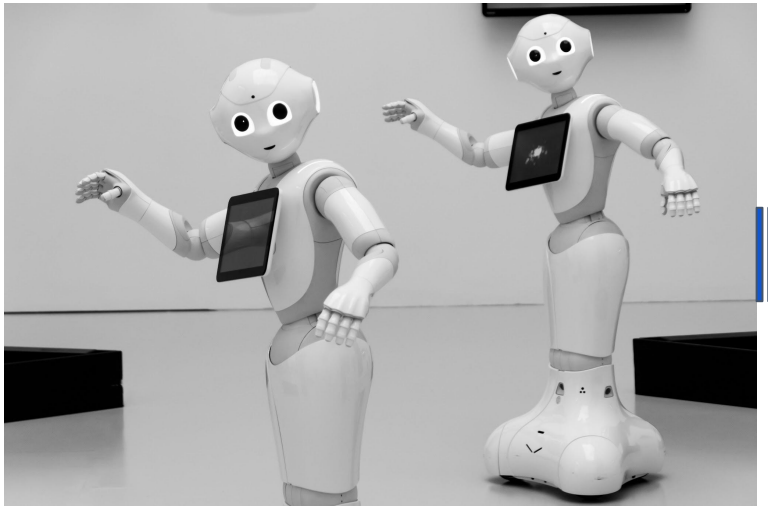
CONSIDERING YOUR PERCEPTION

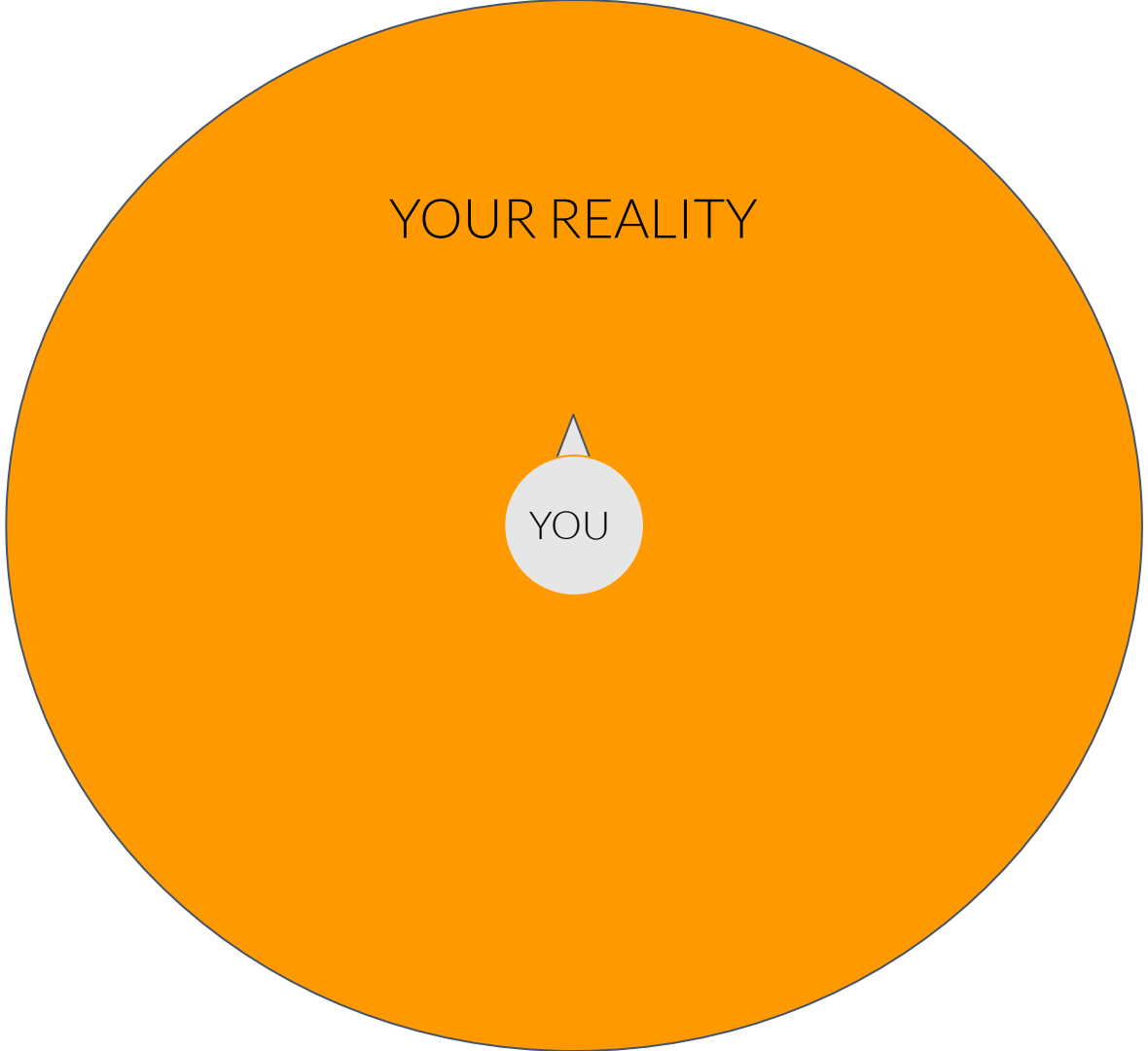
OPINION - HUMAN ANATOMY AND BIOLOGY IS GROSS

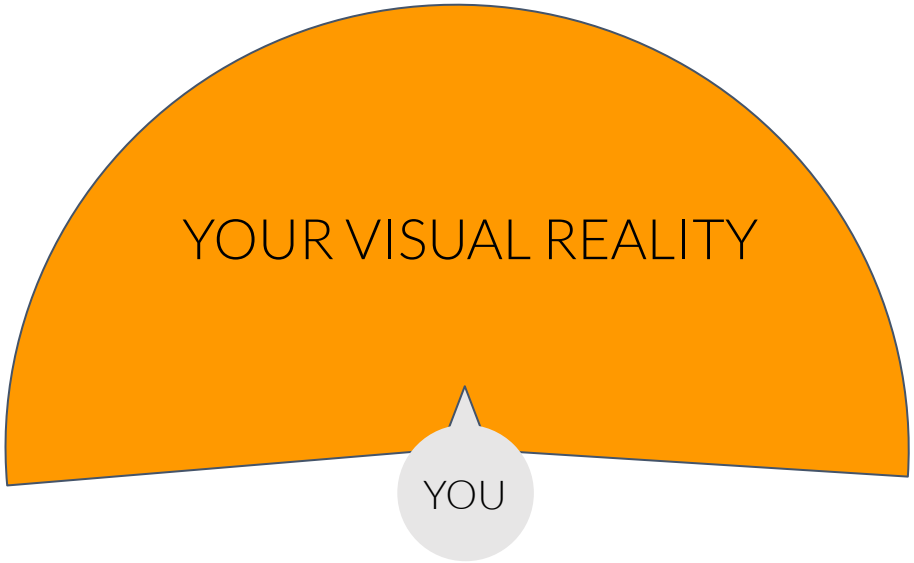


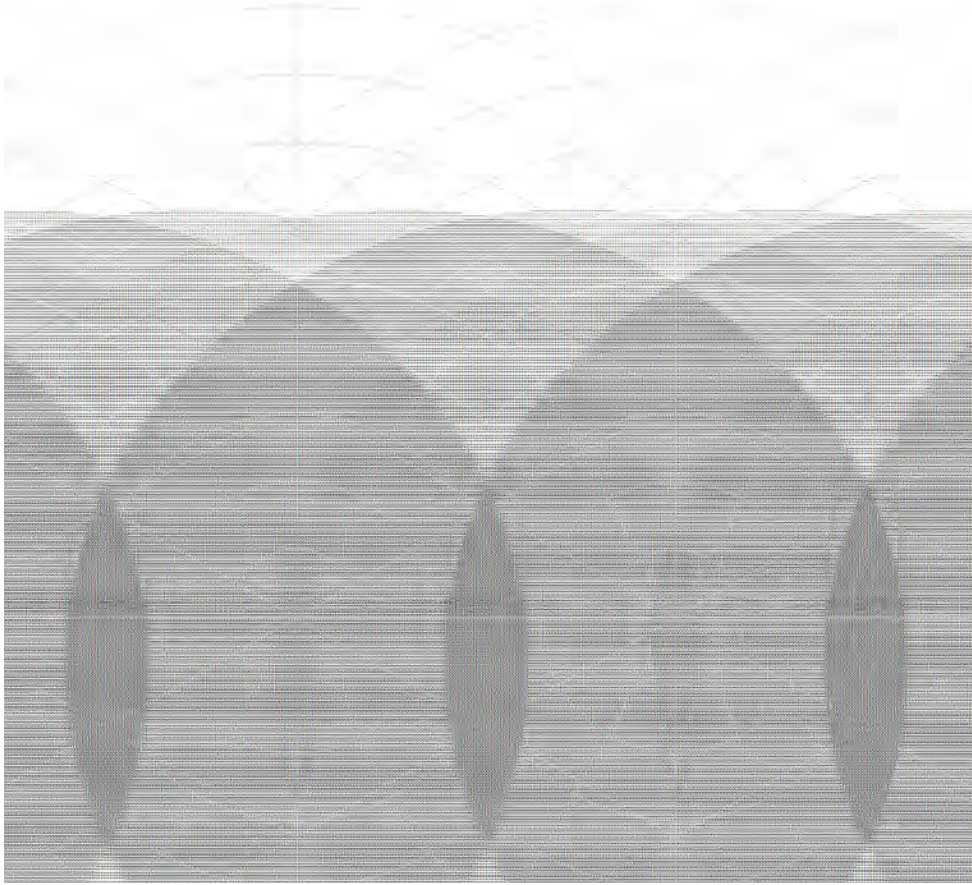


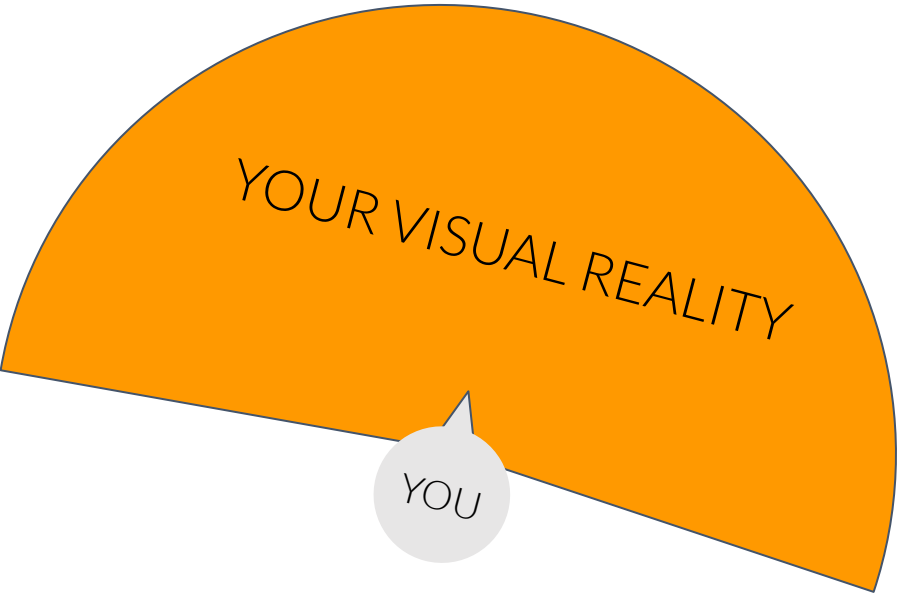
LET'S PRETEND WE'RE PERFECT AND FLAWLESS ROBOTS

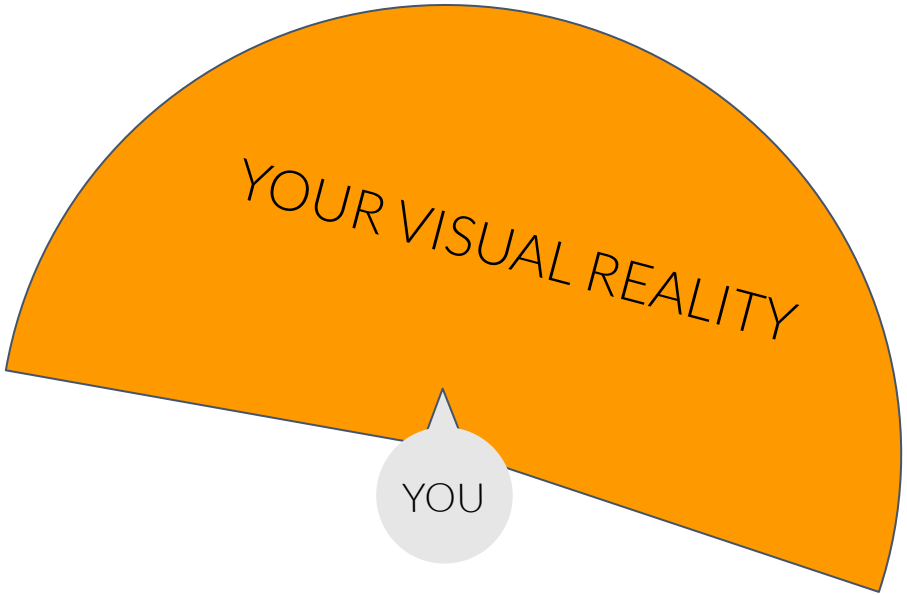



YOUR REALITY
YOU

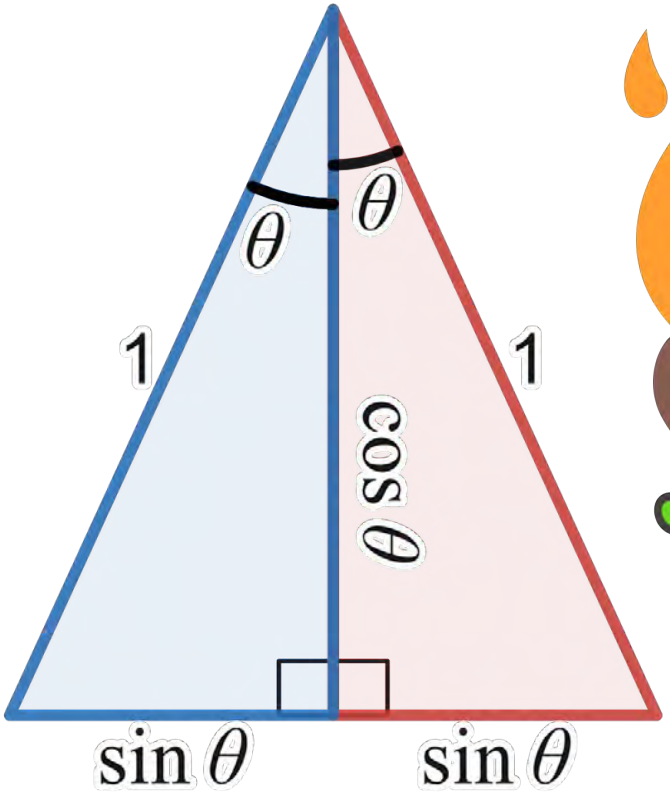

YOUR VISUAL REALITY
YOU

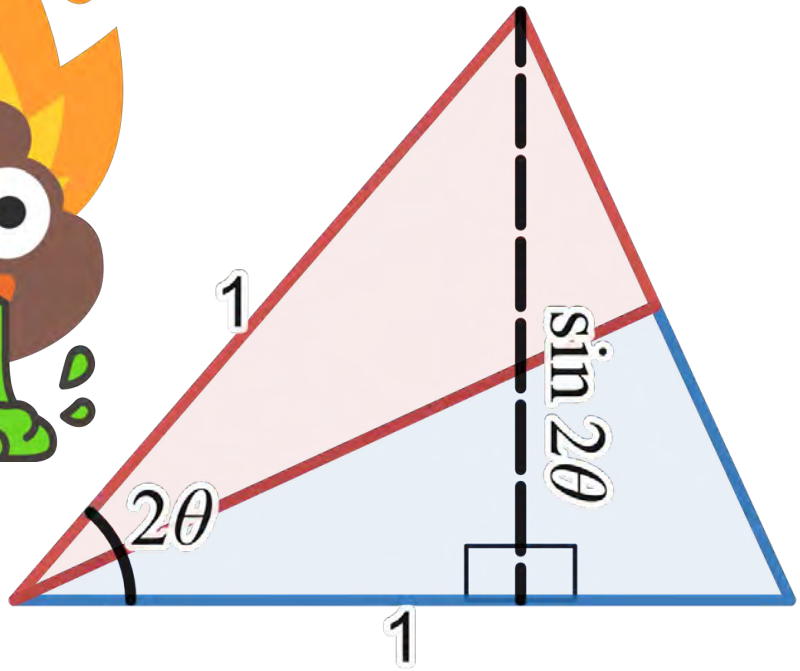



YOUR VISUAL REALITY
YOU

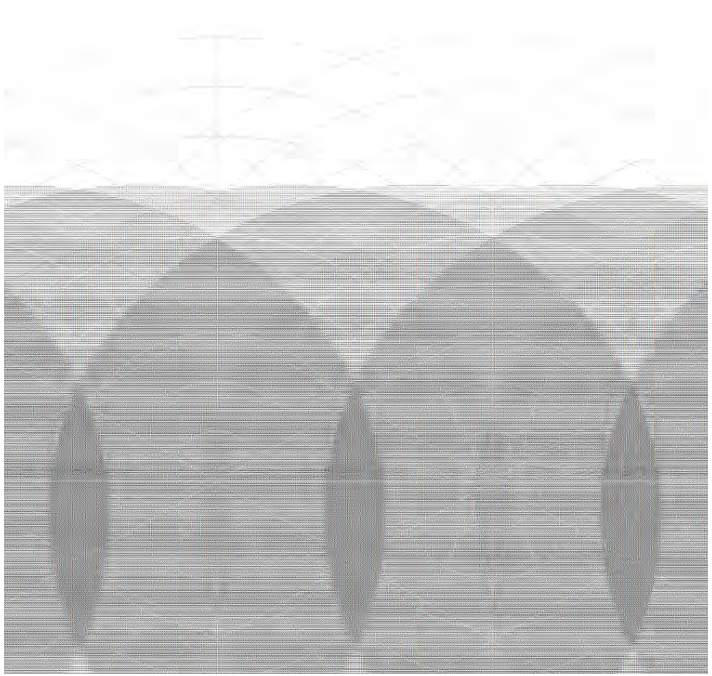

YOUR VISUAL REALITY
YOU

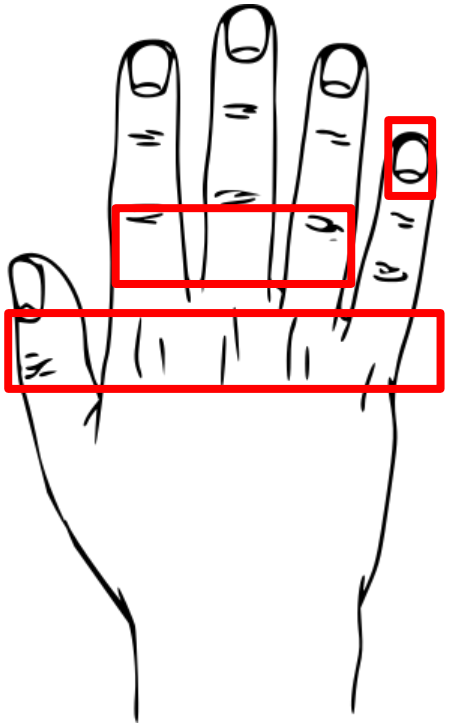
We see the world in degrees.
We measure everything in millimeters.
How do you translate one to the other?





How does this translate to real life?





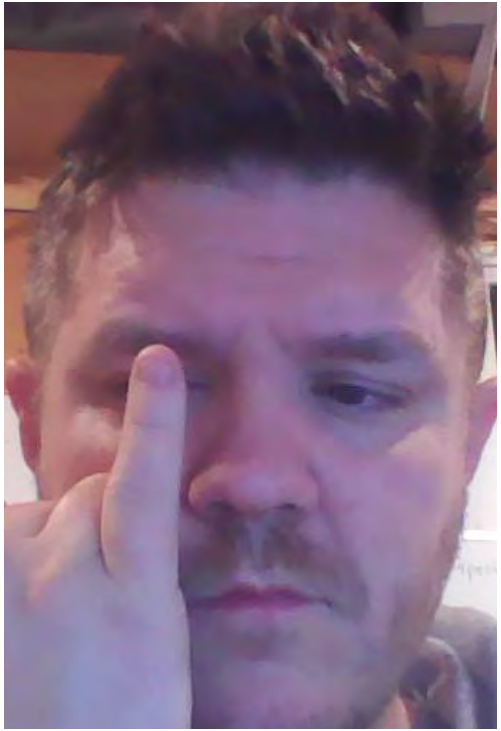
At arms length

1 degree

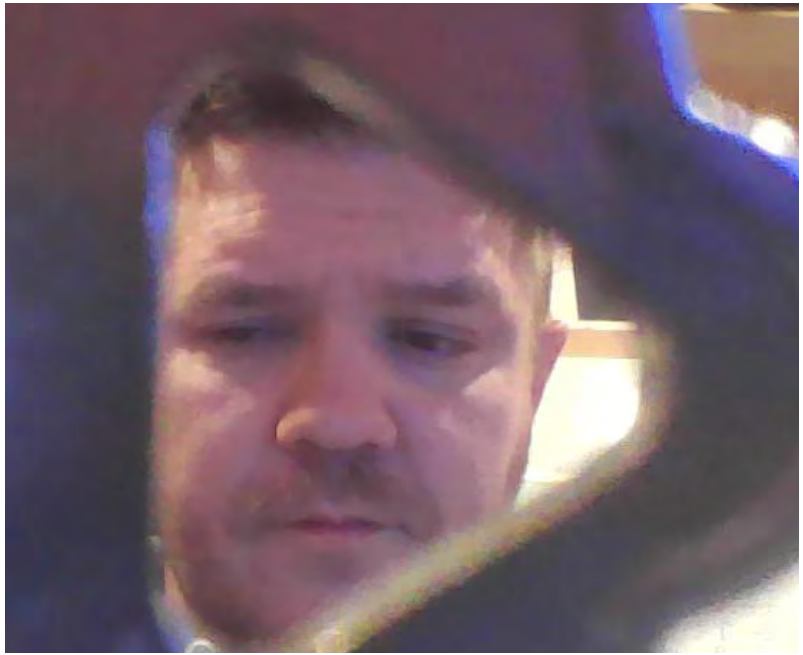
5 degrees

10 degrees

How many degrees is my pinky when I put it here?



Decreasing the Distance from the Eye **Increases** the Degrees It Represents



Closer to eye=more degrees

Further from eye = less degrees

Think of POW measurements as an assessment of how the patient will perceive the world through the glasses

Back Vertex	Perceptual Width of 10 mm	How much wider is it perceived?
13 BVD	26°	0%
11 BVD	29°	12%
8 BVD	34°	31%

Gaze angle to a lined segment

Flat Top Bifocal fit 5mm below pupil	Gaze Angle to line	Fitting Height to Achieve 21° Gaze Angle
13 BVD	**21°**	**5mm below**
11 BVD	**24°**	**4.2mm below**
8 BVD	**32°**	**3.07mm below**

Where the glasses ARE has a big impact on how they are perceived.

LIMITATIONS OF A REFRACTION

The Refraction

- Step 1: Sit Down
- Step 2: Look at static black letters on a white background 20 feet away
- Step 3: Answer 1 or 2 until the refractionist arrives at this:

SPECTACLE PRESCRIPTION ONLY

FOR [redacted] DATE 3 OCT 94

ADDRESS

Rx		SPHERICAL	CYLINDRICAL	AXIS	PRISM	BASE
D.V.	O.D.	-3.25	-.25	130		
	O.S.	+.50	-1.00	80		
N.V.	O.D.	+2.00	add			
	O.S.	+2.00				

REMARKS P.D. 72 / 60

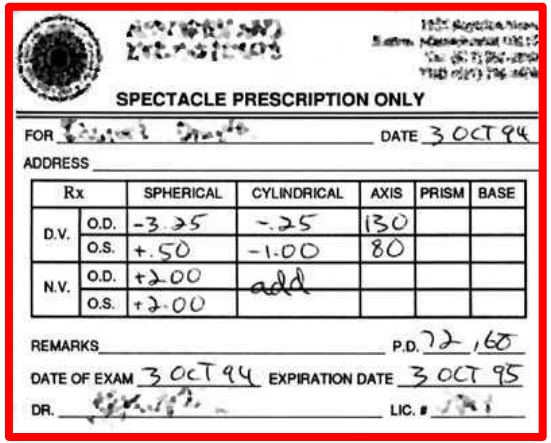
DATE OF EXAM 3 OCT 94 EXPIRATION DATE 3 OCT 95

DR. [redacted] LIC. # [redacted]

What Typically Doesn't Get Answered at the Refraction

- How do your eyes work together when you look 10 degrees to the left?
  - How about the right?
  - Up?
  - Down?
- What are the vergence ranges of your binocularity? How close can you bring your finger to your face before your vision goes double?
  - Does that change substantially when you're tired?
  - How tired are you right now?
- How should we combine all this data with your lifestyle to help select the best performing lenses for you?

GOOD NEWS!



SPECTACLE PRESCRIPTION ONLY

FOR [redacted] DATE 3 OCT 94

ADDRESS

Rx		SPHERICAL	CYLINDRICAL	AXIS	PRISM	BASE
D.V.	O.D.	-3.25	-.25	130		
	O.S.	+.50	-1.00	80		
N.V.	O.D.	+2.00	add			
	O.S.	+2.00				

REMARKS P.D. 72 / 60

DATE OF EXAM 3 OCT 94 EXPIRATION DATE 3 OCT 95

DR. [redacted] LIC. # [redacted]

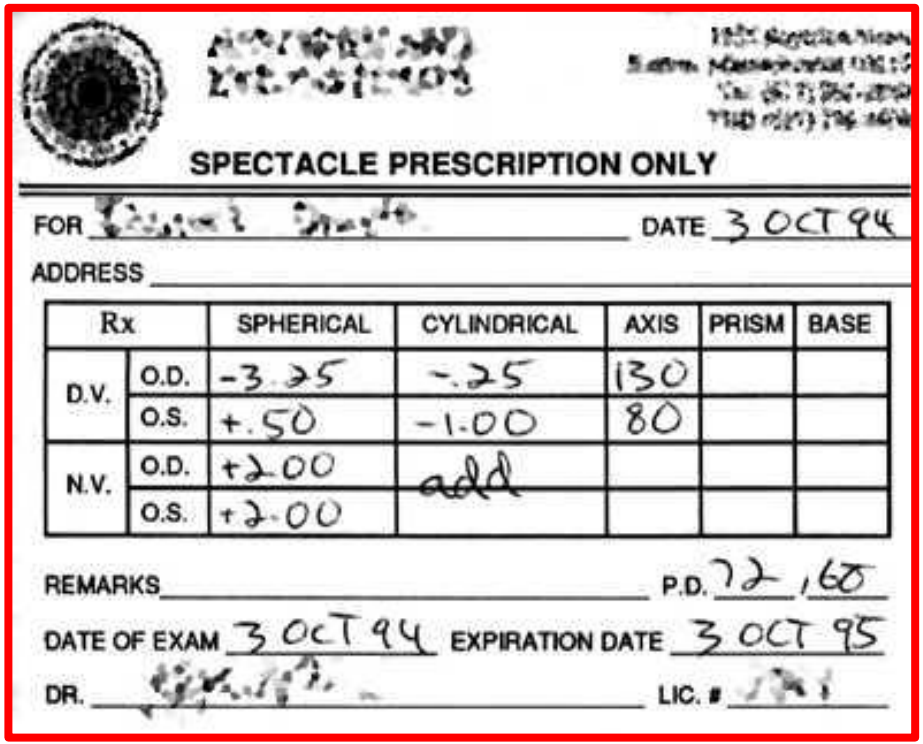
\+

The natural resilience and adaptability of humans

=

Normally, we don't have a problem.

But when there IS a problem…



SPECTACLE PRESCRIPTION ONLY

FOR [redacted] DATE 3 OCT 94

ADDRESS

Rx		SPHERICAL	CYLINDRICAL	AXIS	PRISM	BASE
D.V.	O.D.	-3.25	-.25	130		
	O.S.	+.50	-1.00	80		
N.V.	O.D.	+2.00	add			
	O.S.	+2.00				

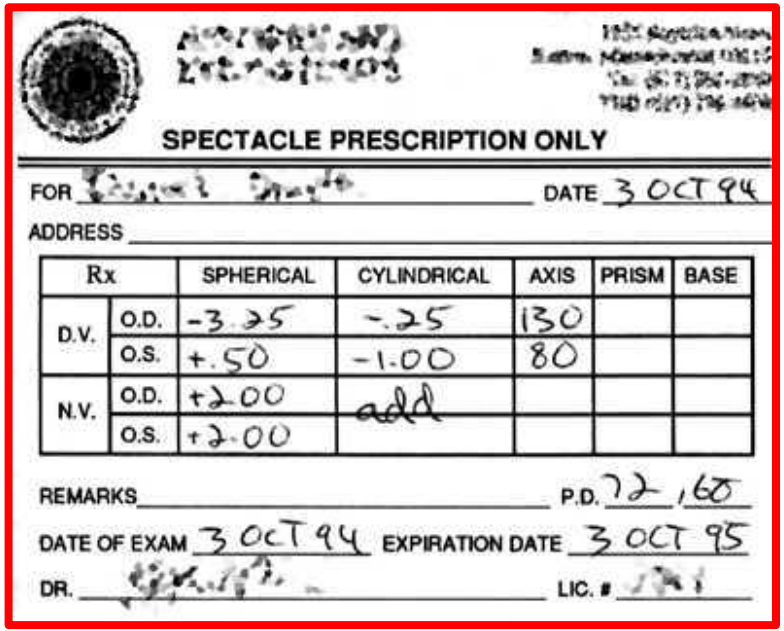
REMARKS P.D. 72, 60

DATE OF EXAM 3 OCT 94 EXPIRATION DATE 3 OCT 95

DR. [redacted] LIC. # [redacted]

This is one of our only tools.

Let's look at bit closer at this RX…any red flags?



SPECTACLE PRESCRIPTION ONLY

FOR [redacted] DATE 3 OCT 94

ADDRESS

Rx		SPHERICAL	CYLINDRICAL	AXIS	PRISM	BASE
D.V.	O.D.	-3.25	-.25	130		
	O.S.	+.50	-1.00	80		
N.V.	O.D.	+2.00	add			
	O.S.	+2.00				

REMARKS P.D. 72, 68

DATE OF EXAM 3 OCT 94 EXPIRATION DATE 3 OCT 95

DR. [redacted] LIC. # [redacted]

Who decides on a slab? The doctor? The optician?

One image might look bigger than the other. Who is normally responsible for managing that?

Most doctors I talk to don't think this is their job…do you think it's yours?

Also…it's like super expired.

Also…Aniseikonia…but NOT in the RX

Is the measurement of image size part of any standard eye exam?

Patients often have non-refractive aniseikonia after retinal surgeries. Does anyone measure for that? Is it the doctor's job? Is it your job?

Most doctors I talk to don't think to tell these things to the optician.

Would you know what to do with it if a doctor did say they needed additional magnification in one eye to offset a size imbalance?

A FEW THINGS…

Occam's Razor

The simplest explanation is usually the best one. Don't whip these ideas out FIRST. Whip them out when you're at your wit's end.

Three Things That Might Make a Patient Seem Crazy

1. Negligent Creation of Unwanted Prism
2. Patient tolerance < > ANSI tolerance
3. Yoked Prism

Ophthalmic Training Levels

Ophthalmologist - years of anatomy and physiology, one course on refraction

Optometrist - years on refraction, one course on ophthalmic optics

Opticians - …?

Negligent Creation of Unwanted Prism

- Eyes misaligned vertically, one higher than the other, imbalance not built into glasses

- Measuring PRP incorrectly
  - Freeform - measure like a PAL
  - Standard lenses - drop 1 mm for every 2 degrees of panto

- Considering patient's previous pair and potential adaptation to flaws

How were ANSI standards created?

A. Based on what could reasonably be manufactured repeatedly and reliably and influenced by the biggest companies trying to minimize their manufacturing failures

B. A diverse study of thousands of humans, assessing their tolerance and reaction to ophthalmic stimuli, carefully considering how humans are best served by ophthalmic lenses

Patient Tolerance <> ANSI tolerance

- ANSI gives 2 mm horizontal tolerance and 1 mm vertical tolerance.
- ANSI gives 2/3D horizontal tolerance, and 1/3D vertical tolerance.
- Post-concussion patients are often sensitive to as little as ¼ diopter of vertical prism
- Doctors often prescribe prism that is completely negated by a gaze shift of a few degrees.
- Don’t assume optometrists know better. They know their stuff. You know your stuff.

Contact Lenses Are Often the Answer

- When you have issues where the eye and the lenses aren't getting along
- Eyes move, glasses stay still
  - Aberrations and issues compound as you get further from the PRPs
- Eyes move, contacts move
  - That doesn't happen.

CHARLIE’S SOAPBOX MOMENT (THE SEQUEL)

Yoked Prism & The Opticianry Gospel

Prism in the same direction _____

- Cancels
- Compounds

What Does Cancels Mean?

- Neutralizes, Offsets, No Net Effect
- Additive, Cumulative, Net Effect

What Does **No Net Effect** Mean?

- It Doesn’t Matter, Irrelevant
- It Matters and is Relevant

Therefore...Prism in the same direction:

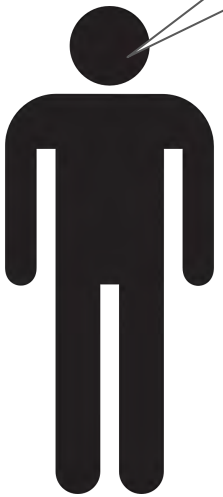
- ➔ Cancels
  - ◆ No Net Effect
    - Doesn't Matter

For visual acuity, yoked prism doesn't matter.

For balance and other aspects of perception, yoked prism DOES matter.

Pay attention to yoked prism. You just might be messing with your patient's well-being.

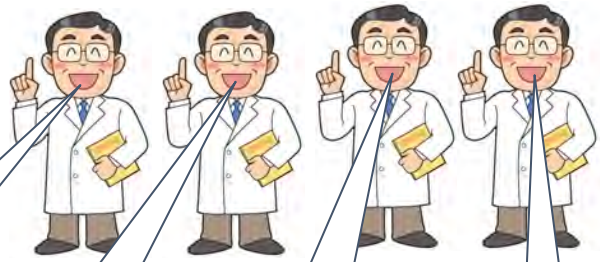
The Standard of Care…Kinda Sucks



Patient:
Something is wrong.

This will probably be you someday.

PURVEYORS OF THE STANDARD OF CARE



The tests we ran look fine, so YOU must be fine.

Great news! Your problem has a name! I did my job!

Your refraction is correct, so everything MUST be fine. You can see 20/20. What more do you want?

Your glasses meet ANSI standards, so everything MUST be fine.

What do most patients do when they're gaslit?

- They just give up.
- They stop coming to your practice since you can't help them
- They go somewhere else (maybe the internet)
- They condemn themselves to a life of suffering

Suffer in Silence? **Not the Engineer!**

IN DEFENSE OF ENGINEERS

The Reality of an Engineer

The stuff inside this pump needs to be manufactured within 0.127 mm (.005 in).

Some pumps have parts with a tolerance of .005 mm (.0002 in)

Up to 760 times the level of precision

The Reality of an Optician

Power of 4.00 vs 4.12 is acceptable

Radius of curvature 132.5 vs 128.64

Manufacturing tolerance is equivalent of 3.86mm (.152”)

A Bit More About Engineering

- Engineered and machined parts are normally processed in large batches (think eyewire screws).
- They are uniform, and the specification never changes.
- Maintaining tight tolerance on such a part is part of the process.
- Tooling is designed and made to support the manufacture of that specific part

- Precision optics are used in things like telescopes and cameras, where hundreds and thousands of lenses are made to the same specifications.

Eyeglass vs. Precision Optics Manufacturing

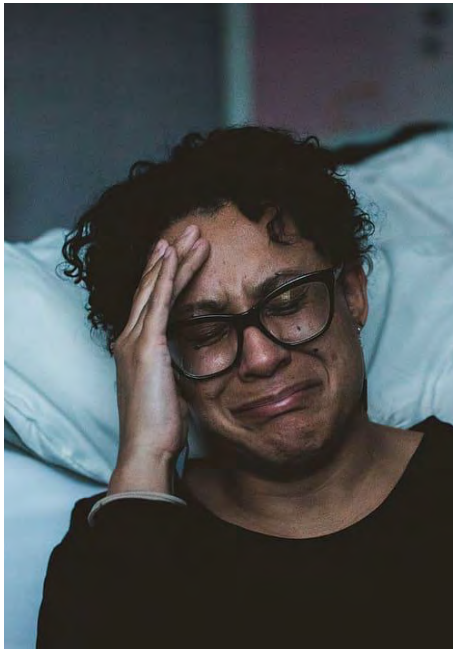
- Process Designed for Variety vs. Consistency (Mass production of prototypes)
- The curing process for plastic lenses results in a shrinkage that mildly affects the curvature and the power of the final lens.
- The machining and engineering processes are used to make the **molds** that are used to cast the lenses. These molds cost several thousand dollars.
- Engineers live in a world of true precision and order. In their world, 0.01 diopter is a joke.

The Chaos of Compounding Tolerance

- While things may seem orderly, the universe is laced with chaos.
  - Where's the next branch going to grow on the tree?
  - Where's the next mole going to appear on your back? When?
- Human faces are a mess…from an engineering standpoint.
- Human eyes are a mess…from an engineering standpoint.
- A system is only as good as its worst part, and the worst part…is you.

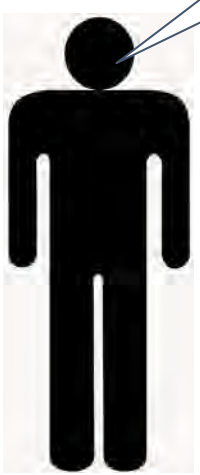
The Stakes of an Engineer

The Stakes of an Optician



CONCLUSION

Can You Exceed the Standard of Care?



Patient:
Something is wrong.

EXCEEDERS OF THE STANDARD OF CARE

The tests we ran don't show anything…maybe they're not telling the whole story.

Your refraction seems to be correct. Let's take a closer look at how your eyes work together.

We have a diagnosis. That's just the beginning. Now we need to consider how to work with you to maintain your quality of life.

Your glasses are made to the manufacturing tolerance, so let's see what else might be at play here.

Exceeding the Standard of Care is a War Against Inertia

- Meeting KPI's around breakages, remakes
- Paying rent
- Paying utilities
- Equipment investment
- Paying staff
- Decreasing Insurance Reimbursements
- Intense competition
- Price compression

Everyone has hero moments. Find yours.

Questions?
Comments?
Uncontrollable Emotions?

Charlie Saccarelli, ABOM