Connecting the Refraction with the Patients Prescriptions

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The Objective Refraction

- Retinoscopy
- Auto Refractor

- Major Meridians
- No interaction with patient

Retinoscopy...

Just as lenses have VERGENCES, so do the eyes!

Convergence

Divergence

Neutralizing the Eye's Major Meridians…

- AGAINST MOTION
- ADD MINUS

- WITH MOTION
- ADD PLUS

- NO MOTION OR "ON OFF" MOTION
- (NEUTRAL)

- COMPENSATING FOR WORKING DISTANCE

Let's take a look at some REFRACTIVE ERRORS

Myopia

Hyperopia

Astigmatism

We could neutralize the eye's refractive error in three ways:

- 1. Retinoscopy (objective refraction)
- 2. Trial Lenses (subjective refraction)
- 3. Phoropter (subjective refraction)
- …most commonly used

Subjective Refraction:

- Phoropter
- Spherical component
- Cylindrical component (JCC)
- Add Power
- Prism Component

What are we really measuring?

The ability for the patient to
SUBTEND A ONE MINUTE OF
ARC ANGLE

What is a one minute of arc angle?

1/60th of a degree

Refining the Sphere Power

Always start with plus lenses…even if we know they are myopic!

Find out if they need a cylinder correction

A little investigative work…

Use a clock dial or cylinder part of the phoropter…Jackson Crossed Cylinder (JCC)

Order of refinement:

- 1. Cylinder Axis
- 2. Cylinder Power
- 3. Sphere Power

Was the patient accommodating? Have we given the patient too much minus?

DUOCHROME

BINOCULAR BALANCE

DUOCHROME

- Show the patient 20/30 or 20/50 line…
- Insert Duochrome (Red/Green slide)

- Ask the patient, “Of the two sides, Red and Green, are they equally clear, or is one side clearer than the other?

DUOCHROME...

- If RED is more clear, add MINUS
- If GREEN is more clear, add PLUS
- If they are equally clear then we have achieved our goal: YELLOW LIGHT ON THE RETINA

Once the right eye is neutralized, repeat the same sequence for the left eye.

How do we know if the eyes are balanced?

BINOCULAR BALANCE

BINOCULAR BALANCE...

- Add prism to disassociate the Snellen line

- ex:
- OD: 3^ BD
- OS: 3^ BU

BINOCULAR BALANCE...

- Fog the patient
- (give them +1.00 to +1.50 OU)

Ask the patient...

"I am going to BLUR the line, and SPLIT the line…"

"Of the two, top and bottom, are they equally blurred, or is one clearer than the other?"

If the top is clearer...

ADD PLUS OD

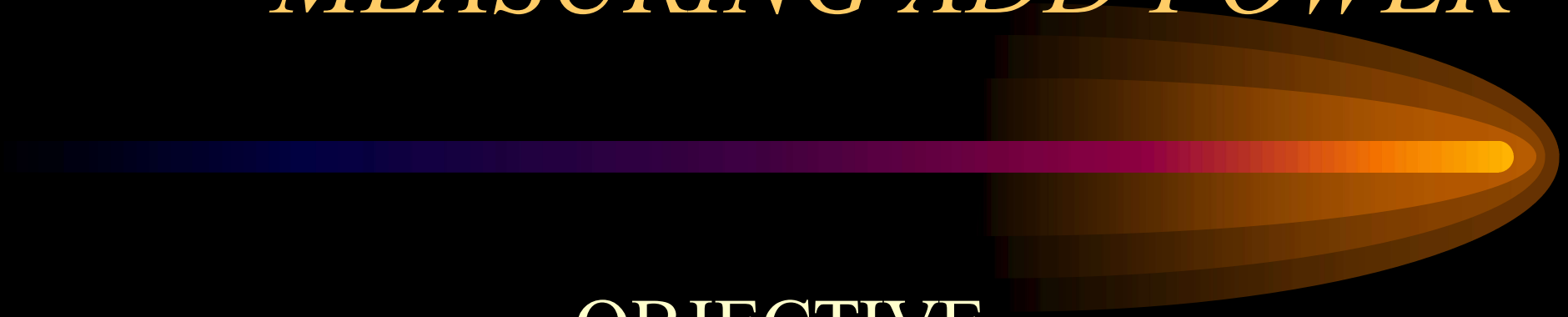
If the bottom is clearer...

ADD PLUS OS

If they are equally blurred...

End Binocular Balance, do
Duochrome OU, then ADD POWER

MEASURING ADD POWER



OBJECTIVE

SUBJECTIVE

FINDING THE ADD POWER OBJECTIVELY

DONDER'S TABLE OF ACCOMMODATION

AMPLITUDE OF ACCOMMODATION…

- Age 10…14.00 D
- Age 15…12.00 D
- Age 20…10.00 D
- Age 25… 8.50 D
- Age 30… 7.00 D
- Age 35… 5.50 D
- Age 40… 4.50 D
- Age 45… 3.50 D
- Age 50… 2.50 D
- Age 55… 1.75 D
- Age 60… 1.00 D
- Age 65… 0.50 D
- Age 70… 0.25 D
- Age 75… 0.00 D

MEASURING THE ADD POWER SUBJECTIVELY...

DYNAMIC CROSS CYLINDER TEST

Now that we have all the numbers, do we write them directly onto the prescription pad?

Compare Data:

- Objective/Subjective
- Latent/Manifest
- Total Rx is somewhere in between!

When do we hold back on lens power?

- High Myopia
- High Astigmatism (high cylinders)
- Emerging Presbyopia
- Children

Rule of thumb...

"When in doubt, throw it out!"

We need to make sure that the new Rx correlates with the previous prescription

Remember our history lessons...

It always repeats itself!

Good common sense

Always the best approach!