Basic Principles of Refraction for Technicians and Assistants
Laurie Pierce ABOM, NCLC
Hillsborough Community College

The Objective Refraction

- Retinoscopy
- Auto Refractor

Just as lenses have VERGENCES, so do the eyes!
Convergence
Divergence

Neutralizing the Eye’s Major Meridians...

- AGAINST MOTION
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?
The ability for the eye to subtend a 1 minute angle (20/20 VA)

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

DUOCHROME

BINOCULAR BALANCE

• 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?

• Fog the patient
FINDING THE ADD POWER OBJECTIVELY

DONDER’S TABLE OF ACCOMMODATION

Donder’s Table: 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!