SUMMARY OF *THE PRACTICE OF MODERN OPTOMETRY* *
by WILLIAM HENNING, N.D., O.D.

Summarized by Ray Gottlieb, O.D., Ph.D.
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HENNING'S GENERAL STATEMENT

The combination of color and orthoptic therapy set in motion a train of psychophysical changes which result in a redistribution of energy. This harmonizes the ocular pattern but it does not stop there. These changes are transmitted to all parts of the body, and unless the condition has progressed beyond certain limits, the body will correct itself. The fact that various physical conditions are associated with definite ocular syndromes does not mean that the physical condition is being treated. The general improvements that often follow the reconditioning of a pair of eyes is attributed the elimination of obstacles which interfere with the compensatory and rebuilding powers of the body. However, we recognize the limits of the body to readjust itself. Therefore, determine as near as possible whether or not there are any physical disorders with which the body is unable to cope without the aid of a physician. The indications in the analytical routine usually give us sufficient data for intelligent questioning and when we know the common symptoms associated with various physical disorders, we are in position to draw fairly accurate conclusions.

FOUR BASIC FREQUENCIES

Henning uses four basic analytical frequencies (all other frequencies either modify or intensify these): INDIGO, GREEN-BLUE (both palliative), RED-INDIGO and GREEN-YELLOW (both corrective). Fundamentally there are only two responses: contraction and expansion. Although all frequencies are stimuli, application of the BLUE-INDIGO-VIOLET frequencies induce expansion; disinhibition; dilation; relaxation; decreased secretions; increased absorption; pleasure, relief, etc.
Those on the RED-ORANGE-YELLOW end elicit contraction; stimulation; constriction; tension; spasm; increased secretions; increased metabolism; decreased absorption; and increased pain and discomfort.

FOUR RULES OF TREATMENT

RULE #1: Palliative (symptom relief) treatment must precede all other training (i.e., if symptoms: BLUE end before RED end).

RULE #2: Treat only with color (without lenses or prisms) if findings vary radically during the exam or when high exo distant/high eso near. Or *visa-versa*.

RULE #3: For constant wear prescribe, except in cases of absolute necessity, only the amount of lens power r
(May disregard, use your judgement.)

RULE #4: Findings and symptoms must be evaluated according to age and sex. (See notes below for specifics.)

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* *Modern Optometry*, published in 1939, is one of a set of three self-published monographs by Henning.

PRESCRIBING GLASSES

Henning contends that supportive lenses, or, prisms should be prescribed only as a last resort, and then only the amount required for adequate vision. When he does prescribe, he retakes the plus and minus at near findings and does chromorthoptics to bring the findings into balance with the supportive lens prescription.

HOW LONG TO TREAT:

Whenever a definite change has been noted, either by the patient or the doctor, it is sufficient for that frequency. Ask and listen for reports of change and learn to observe the appearance and behavior before training. This requires considerable practice to become proficient. It is especially important when treating patients with abnormal ocular findings but no symptoms. Otherwise you will not know how long to treat. It is always better to under-treat than to over-treat. It is more than a waste of time, it is actually detrimental to treat for ten minutes if he responds in four. Wait until at least ten minutes following the treatment to re-test the findings.

OBJECTIVE SIGNS TO GUIDE TREATMENT:

If the patient is pale, ocular improvement will also benefit the circulation so the patient will become pinker (usually seen in the forehead and ears). High voices can lower and resonate, and shallow breathing will reach greater depth within a few minutes. The general behavioral changes include walking, moving from one position to another, the reaction time in answering questions, the speed of speech.

FLASHING

When any of the BLUE-INDIGO-VIOLET frequencies are being used, it is well to instruct the patient to close the eyes at certain intervals, but if one of the RED-ORANGE-YELLOW bands is applied, it is better to flash. Flashing, necessary to increase stimulation, is achieved by turning the light off for twice as long as it is on. If the patient shows any signs of irritation (hyperemia or restlessness) discontinue the flashing.

TEARING

A minute or two of BLUE followed by two or three minutes of GREEN-BLUE is sufficient to lessen extreme watering.

INSTRUMENTATION

The five colors are edged to fit into a trial frame with opaque side to block extraneous light; the target is a trans-illuminated target at 16 inches.

THE EXAMINATION

TESTS	EXPECTEDS*
#1. Ophthalmoscopic examination	neg
#2. Ophthalmometer findings.	neg
#3. The habitual phoria at distance.**	ortho
#4. The habitual phoria at near.	6 exo
#5. The static retinoscope test.	+.25-+1.00
#6. The dynamic retinoscope test	+1.00-+1.75
#7. The subjective test.	+.25-+1.00
#8. The distance phoria.***	ortho
#9. Distance prisms base-out to blur.	7 or more
#10. Distance prisms base-out to break & recovery.	20/10
#11. Distance prisms base-in to break and recovery.	9/5
#12. Distance vertical phoria.	neg
#13. Induced phoria at near.	6 exo
#14. The fused cross cylinder test.	+1.0-+1.75
#15. The near phoria through #14.	6-8 exo
#16. The prisms base-out: blur-out, break & recovery.	14/21/15
#17. The prisms base-in: blur-out, break & recovery.	14/22/18
#18. Vertical phoria test at near.	neg
#19. The push-up accommodative amplitude.	Donders
#20. The minus lens blur-out at near.	-2.--2.5
#21. The plus lens blur-out at near.	+2.-+2.5

* These expecteds are for ages 15-35 years; in young children the blur-outs should be higher; after age 30 lower.

** The 200-foot letter for all tests except the blur-out tests in which the smallest read letters are used.

***This and the rest (not #14, of course) done with #7 in place until age 45 add +1 to #7, age 50 add +1.5, age 55 add +2, age 60 add +2.25, age 65 add + 2.5.

The question should always be "Why are the findings as they are?" "Why the esophoria in a given case?", Why a low recovery?".

EIGHT STEP ANALYTICAL ROUTINE (See notes for each step)

STEP #1: GREEN-YELLOW for low ductions. If either both distant or both near ductions are low count GREEN-YELLOW X 1, if all are low count GREEN -YELLOW X 2. If normal ductions, step #1 is NEGATIVE.

STEP #2: BASE-IN, BASE-OUT for phoria correction. A grand average of eso indicates BASE-IN, of exo indicates BASE-OUT in the treatment. If borderline, not eso or exo, step #2 is NEGATIVE.

STEP #3: RED-INDIGO for low accommodation (low minus to blur-out at 16" relative to plus) If higher minus than plus step #3 is NEGATIVE.

STEP #4: REVERSED phoria/ductions at distance. If ductions are reversed to the phoria (e.g., eso with low base-out and normal base-in ductions or exo with low base-in and high base-out ductions), train with base-out in spite of the esophoria until the ductions are in agreement with the phoria. If phoria and ductions agree call step #4 NEGATIVE.

STEP #5: RED-INDIGO or GREEN-YELLOW for low duction recoveries. RED-INDIGO for low base-out recovery (RED-INDIGO X 2 if both ductions low). Suggests past or present pelvic problems: sex organ malfunction, genitourinary tract, thyroid gland.
GREEN-YELLOW for low base-in recovery (GREEN-YELLOW X 2 if both base-in recoveries are low). Suggests metabolic, nutritional disturbance, gastric, renal, hepatic congestion, etc.
If OK ductions recoveries call step #5 NEGATIVE.

STEP #6: Other GREEN-YELLOW indicating ocular manifestations of retention of waste products in the tissues (metabolic disorders):
Low findings in: 1) static retinascope; 2) distance base-in duction; 3) induced near phoria; 4) base-in duction at near; 5) accommodative amplitude (push-up); 6) vertical imbalance; 7) cyclophoria.
When several are low, call step #6 GREEN-YELLOW X N. If no indications call step #6 NEGATIVE.

STEP #7: INDIGO for signs of tension. 1) Low base-out to blur at far; 2) Near base-in- and base-out-to-blur-out both low (<24 prism diopters in kids, <20 in young adults, less for older); 3) Low plus and minus lenses to blur-out at near (<4.5 diopters for kids, <4 diopters for young adults); 5) Base-in ductions and near plus blur-out are relatively lo wer than base-out ductions and near minus blur-out for non-exo patients.
When there is pain or the above findings are satisfactory call step #7 NEGATIVE.

STEP #8: GREEN-BLUE for pain and inflammation (asthenopia, discomfort, photophobia) associated with findings of step #7. When there is no discomfort, call step #8 NEGATIVE.

Note #1.
Whenever all the ductions are low, the individual is chronically ill whether the patient knows it or not. If the findings indicate GREEN-YELLOW but there is discomfort at the time of treatment use GREEN-BLUE or related frequencies until the symptoms subside. Under such circumstances do not apply a corrective frequency at the same visit.
GREEN-YELLOW: for complications denoting metabolic disorders (cleansing for retention of waste) "the following demonstrable activities are set in motion: 1) an increased flow of secretions; 2) increased motor activity (convergence); and 3) improved oxidation. These have a cleansing effect. The need for GREEN-YELLOW increases with age beyond 25 years. Retention of waste may be due to one of several causative factors, such as overeating, insufficient rest, or other forms of abuse. In children with GREEN YELLOW indication ask about diet, and unless that can be cared for, if it is faulty, the prognosis is doubtful.
Related frequencies: On the stimulating side is RED-BLUE and RED-YELLOW. The most outstanding property of RED-YELLOW is that of respiratory stimulation, so that if the patient's breathing is very shallow RED-YELLOW would be the most logical frequency to employ.
RED-BLUE stimulates vaso-constriction not much used with kids but for teens until 50 years can help low blood-pressure and deficient abdominal circulation.

Note #2.
PRISMS IN TREATMENT: Give the opposite near duction recovery (eso gets the base-in duction recovery). The duction is re-measured for the next treatment and the new recovery finding would be used.
Prism power used in treatment: always means the recovery point at the distance where the target is placed. Should the recovery point be less than zero, the prism placement is opposite. 5-1

Note #3.
RED-INDIGO: The emotional stabilizer. Used for increasing lowered responses in the involuntary system (as in reduced accommodation and pupil responses) associated with emotional upset. RED-INDIGO is called for when the minus lens to blur at near is low relative to plus.
Related frequencies: RED-YELLOW and RED-BLUE are intensifiers; INDIGO and BLUE-INDIGO are modifiers. To differentiate which to use when, consider age, sex, environment, behavior, appearance, and genes.
Under 10 years and underweight suspect retarded glandular development due to malnutrition, over attention, shock, etc. Start with RED-INDIGO and watch for improvement. If response is minimal, try RED-YELLOW for a few sittings. If still sluggish, combine minus with RED-INDIGO. (-0.50 and add -0.25 steps until -2.00.) If still slow add two to four diopters of base-in prism. If no response it is likely a medical problem.
In ages from 10 to 25 years emotions play a greater role, and RED-BLUE is more effective than RED-YELLOW should RED-INDIGO be inadequate.
When both RED-INDIGO and GREEN-YELLOW are called for in a case with an emotional background, it is well to use RED-INDIGO first and finish with a minute or two of GREEN-YELLOW.
From 25 to age 45 years GREEN-YELLOW and RED-INDIGO are of equal importance unless GREEN-YELLOW is called twice.
Above 45 years GREEN-YELLOW becomes increasingly important and the need for RED-INDIGO and it's related frequencies diminishes.
Emotional disturbance may be financial worries, a disappointment in love, bereavement, mismating, nagging, etc. sufficient to cause the retention of waste because any emotional disturbance interferes with circulation and the metabolic processes in general. This can readily be ascertained by asking the patient a few pointed questions.

Note #5.
Low base-in recoveries indicate alimentary canal problems (metabolism, nutrition, digestion, growth, rebuilding). Low base-out recoveries relate to sexual/pelvic disorders.
Under age 10, low base-out recoveries indicate retarded glandular development calling for RED-INDIGO and related frequencies. Low base-in recoveries indicates nutritional disturbance with GREEN-YELLOW and related frequencies called for. If all other findings are satisfactory but all recovers are low in the under 10 age group, we conclude that all physical reserves are low and the patient is disturbed emotionally.
Ages 10 through 25 with low base-out recoveries may result from emotional upset, a venereal disease, or some type of obstruction or inflammatory process. The most common emotional disturbance in optometry, especially in teens and young adults with ocular discomfort but little refractive error, is due to sexual repression or neurosis.
Younger women may have scanty menstrual flow leading to retention of waste localized in the pelvis resulting in a mild inflammatory condition. Menstrual disorders or sexual repression may cause acute inflammatory processes in the tubes, ovaries, and vagina. In some cases venereal infections may be the cause.
In women past middle age, low base-out recoveries is indicative of inflammatory processes of the pelvis, chronic or acute, manifesting in the form of an ovaritis, endometritis, malignant or benign tumor, or purely a climacteric chain of syndromes commonly found during the menopause. In middle aged men, suspect disturbances in prostrate, bladder, or perhaps adrenal. Either refer to physician or try a few treatments of RED-INDIGO frequencies and re-test the recovery points. If improvement, the cause is emotional. If no change, try GREEN-YELLOW. If still no improvement, refer.
The emotions are closely related to reproductive or gans because signs of emotional upset (irritability, hypertension, rapid heart, hyperthyroidism) usually accompany pelvic disorders.
Reproductive and alimentary systems interact and emotional problems may lead to loss of appetite, spastic constipation, and digestive disorders. You can tell the difference if the digestive problems are relieved by modifying the emotional upset.
General physical disorders become more complex and the individual less responsive with age.
If the low base-out recovery findings do not immediately come up after a few sessions, the case is not amenable to orthoptic training alone. If the syndrome is due to a focus of infection, the patient may be temporarily relieved but the findings usually remain about the same.

Note #6.
INDIGO is indicated when #7 findings are associated with nervousnnss or irritability (but not pain). Inquire about general symptoms of nervousness, sleeplessness, and other signs of tension due to emotional disturbance.
The tension which is manifest in the ocular pattern very likely exists throughout the body, interfering with circulation which results in retention of waste products. INDIGO also increases circulation. The application of INDIGO, together with base-in prisms during the training period, induces expansion. This removes the interference to circulation, which will quickly carry away the accumulated debris.
INDIGO: for signs of tension as in eso and low base -in findings. Treatment with INDIGO is used with base-in prism equal to the base-in recovery. INDIGO is a motor depressant and induces expansion to lead the eso to expand out into space.
In younger age groups (under 45 years) INDIGO is very effective. In older patients with high blood pressure try YELLOW-INDIGO to lower the pressure, then continue with INDIGO until findings improve. Follow with GREEN treatments once a week for a few weeks to stabilize.
Related frequencies are BLUE-INDIGO which intensifies its action, and YELLOW-INDIGO is a modifier.

Note #7.
GREEN-BLUE: for pain as in asthenopia and photophobia. BLUE and BLUE-INDIGO are intensifiers, GREEN is a modifier.
For severe pain, begin with BLUE-INDIGO until the symptoms change. Usually a minute or two is sufficient for the patient to report a slight amount of relief. Then BLUE until even more relief (usually only a minute or two); then GREEN-BLUE for three or four more minutes. If the patient returns with reduced symptoms start with BLUE for a minute or two, then GREEN-BLUE.
Whenever GREEN-BLUE or related frequencies are called for, GREEN-YELLOW is substituted if no discomfort is present at the time of treatment.
When a patient is treated entirely according to subjective symptoms, relief from discomfort is the guide to response.
In cases of discomfort is it is important to give a treatment every day, or even twice a day, until the symptoms have subsided. After that, two or three times a week is usually quite satisfactory.
Responses in older patients are relatively slow,which requires more extreme stimuli. But if the subjective symptoms are such that intense stimulation aggravates the symptoms due to localized tissue irritation, begin very cautiously and modify the more important manifestations for the purpose of obtaining immediate localized relief.

REDUCING AMETROPIA AND HETEROPHORIA

These procedures assume completion of initial training to reduce symptoms and ocular signs of related psycho physiological pr oblems. Some reduction of the ametropia and phoria may have resulted from the first training processes.
To decrease myopia, the sensory depressant, BLUE, and plus lenses are given. For hyperopia, the sensory stimulant, RED, and minus lenses are given. To decrease eso, the motor depressant, INDIGO, and base-in are given, and to decrease exo, the motor stimulant, YELLOW, and base-out are given.
It is important to give occasional REST PERIODS of one or two weeks during these procedures because postural changes are transmitted to all parts of the body and, therefore, cannot be done hurriedly. Furthermore, the process is partly that of establishing new habits, which must also be done slowly, if permanence is to be expected.
The possibility of reducing ametropia decreases with age.

ESOPHORIA

1) Start in-office training using INDIGO combined with base-in prism (equal to the near base-in recovery).
2) Prescribe two base-in prism for constant wear. Being accustomed to the habitual phoria, the posture will readily change to revert to back to the original convergence through the prisms. After the phoria reverts back to the original phoria, add two more base-in.
(Henning's idea is this: The patient will adapt by returning to the habitual phoria posture through the prescribed prism. If an orthophoric patient wears two base-in, the immediate phoria is two eso. But being accustomed orthophoria, the patient, after wearing two base-in full-time, would eventually adopt an ortho posture through the prism. [Remove the prism and the patient would measure two exo]. This happens each time two more base-in are added. Base-in training with INDIGO aids this readjustment.)
3) Add more base-in until the total is two more than the initial esophoria at far.
4) Now reverse the process. In two prism diopter steps, remove base-in from the prescription. Training is continued using INDIGO and base-in in order to hold the new postural position. Remove two base-in, making the phoria two less eso. If this reduction holds, two more base-in are removed, reducing the phoria measurement again until exo is measured through no prisms.

5) Continue training with base-in and INDIGO to hold the new ortho or slight exo posture.
For high ESOPHORIA at near when all other findings are satisfactory and no symptoms: Prescribe an hour or two of reading every day through prisms base-in. How much prism? If the recovery for base-in near duction is high 12 or more, give 70% of the recovery; if recovery is 8, prescribe the whole value of the recovery; if the break is high (16) but the recovery is low, prescribe half the break; if both break and recovery are low, give what the patient will accept and increase it as rapidly as the patient will tolerate until six prism diopters has been reached.
Advise the patient to take one minute rest periods every 10 to 15 minutes, recline with eyes closed (palming) to relax the whole body and mind. In most cases a week to ten days is sufficient to break down the old habit.
Often training prisms are supplied through fit-overs used for reading.

EXOPHORIA
This is done as in esophoria but prescribing base-out prisms full time and training using base-out with RED-YELLOW, YELLOW, and GREEN-YELLOW. Often low plus spheres must be incorporated to prevent a possible accommodative reflex, especially in children and young adults.

HYPEROPIA
Hyperopia is an indication of a lowered tonus in the involuntary muscle system (cilliary). Occasionally it is possible succeed with someone near forty but for patients past age 30, it is often necessary to prescribe for most of the ametropia.
RED-YELLOW, RED-BLUE, RED-INDIGO, YELLOW, AND GREEN-YELLOW frequencies are all indicated for reducing orthophoria hyperopia unless retarded glandular development or reproductive (emotional) disturbance is indicated.
1) Reduce plus and astigmatism (if any) by 0.50. for constant wear. Care must be taken to guard against accommodative/convergence, so add a small base-in to the Rx.
2) Train with the above frequencies combined with minus (or less plus) lenses and base-in. The minus-to-blur at near is the guide. When the minus-to-blur exceeds the plus, reduce another 0.50 of plus, and continue training to again increase minus-to-blur at near.
3) Repeat the process until the hyperopia is eliminated. When vision is 20/20 without lenses, give -0.5 for constant wear.
4) Continue training remembering to give two weeks of rest between lens changes.

Eso's and exo's require a slight difference in training procedures. Hyperopic esophores require base-in prisms and RED-YELLOW, RED-BLUE and RED-INDIGO. Hyperopic exophores use base-out and RED-YELLOW, YELLOW, and GREEN-YELLOW. Train with the above frequencies, using two at each sitting. Start with the more extreme followed by the more moderate frequency.
(E.g.., eso's get RED-YELLOW for several minutes followed by RED-INDIGO on the first day, and RED-BLUE followed by RED-INDIGO on the second. This cycle is repeated until the accommodative finding improves. Exo's start the first visit with RED-YELLOW and then GREEN-YELLOW. Next day YELLOW is first followed by GREEN-YELLOW. This pattern is alternated.) If possible, try flashing. Treatments might take six months or longer (with occasional ten day to two week rest periods). If the minus-to-blur goes up rapidly, the patient is apt to respond favorably; if the response is slow, the process will likely be long; and if no change takes place in the minus-to-blur, the patient is probably out of luck at this time. Henning suggests trying again several months later.

MYOPIA

Henning bases his approach on the ac/a reflex in which divergence induces relaxation of focus. He attempts to artificially produce esophoria of six prism diopters for every diopter of myopia and then provoke myopia reduction through less plus and base-in training with the appropriate frequencies.

1) Reduce minus and add base-out for full-time wear
2) Train with sedative frequencies and base-out. The aim is to increase esophoria without increasing the myopia.
3) When the induced phoria reverts back to the habitual, add two more base-out to the Rx.
4) Repeat until the esophoria equals the myopia (see above).
5) Cut minus and base-out from the Rx.
6) Train with sedative frequencies, plus lenses, and base-in to reduce myopia.
7) As acuity improves, cut minus and base-out.
8) Repeat the entire process until the myopia is gone.

Lens prescription: cut the minus by half of the subjective (or by one diopter for cases of two or more diopters of myopia) and add two prism diopters base-out, for constant wear. Distance acuity should be about 20/40-20/60. The phoria should increase by two exo through the Rx. Being accustomed to the habitual phoria, the posture will readily change to revert to back to the original convergence through the prisms. To aid this readjustment, base-out treatments (using the near duction base-out recovery) combined with sedative (inhibited) frequencies BLUE-INDIGO, INDIGO, YELLOW-INDIGO, BLUE, and GREEN-BLUE are given to inhibit focus.

Use two different frequencies during one training period, beginning with a more extreme for a minute or two, then two or three minutes with a more moderate frequency. BLUE-INDIGO and BLUE for the first, INDIGO and YELLOW-INDIGO for the second, BLUE-INDIGO and YELLOW-INDIGO next, followed by INDIGO and GREEN-BLUE, and the whole procedure is repeated.

When the phoria through the distan ce Rx returns to its original posture, take a two week break from training, and then add two more base-out and repe at the training procedures until the esophoria becomes five times the dioptric value of the myopia or reaches ten base-out.

At this point, remove two base-out is removed from full-time prescription and train using the sedative frequencies as before but now train with base-in (base-in near duction recovery) and plus to induce inhibition to both convergence and focus. When the patient has reverted to the habitual phoria, a small amount of myopia will also have been eliminated (0.25 to 0.50 reduction). Check acuity often and when vision through the Rx improves to 20/20 or 20/25, prescribe 0.50 less minus and two prism diopters less base-out for constant wear. Continue the training, changing the training prism as the base-in duction recovery increases. Reduce two more base-out from the Rx when the phoria reverts. Check acuity to remove more minus from the Rx.

When all the prisms have been removed, give the patient a rest period of two or three weeks. Then if the acuity stays clear, again reduce the Rx by half (or one diopter if myopia is over -2.00), add two base-out for full time wear, and repeat the training using base-out and the sedative frequencies as before.

Very often it is necessary to repeat the entire procedure because only a small amount of the myopia was eliminated during the first series. Each time more of the myopia should be eliminated until the ametropia goes into slight hyperopia or the patien t reaches the limit of change. If the patient returns after three to six months, the process can be repeated and more myopia can be eliminated.