

Complex approach to treatment of myopia in school-age children with help of SCENAR therapy

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Background

Refraction abnormalities are the main cause of eye disorders in schoolchildren today. The prevalence of myopia among school-aged children is 12 – 35%.

Degenerative myopia ranks second among the causes of eye-related handicaps in young adults. Its development is provided by the following factors.

Genetic predisposition

Children of myopic parents are frequently myopic.

Primary weakness of accommodation

Causes compensatory lengthening of sclera.

Unbalanced, strained accommodation and convergence

Lead to false and subsequently true myopia. This can be promoted by disorders of the autonomic nervous system, which is actively involved in accommodation, since the pupil sphincter and Brucke's fibers are controlled by the parasympathetic part, and the dilator muscle of pupil and Ivanov's fibers by the sympathetic part.

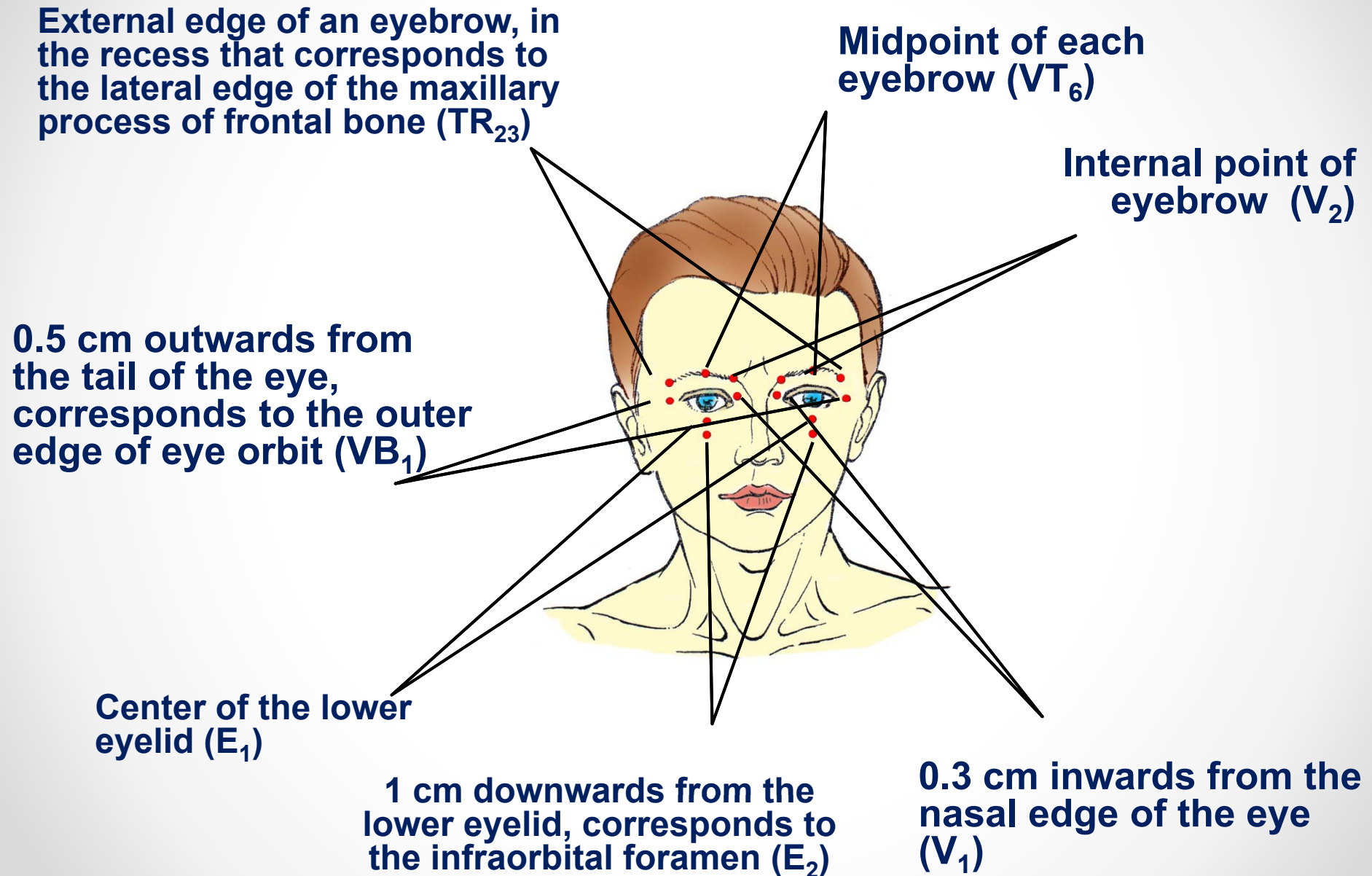
General health decline

General health condition can contribute much to myopia development. Such diseases as rheumatism, arthritis, chronic tonsillitis exacerbation, infectious hepatitis cause a general weakening of conjunctive tissues in the whole body, including the eye sclera. Such sclera extends readily, causing myopia progression.

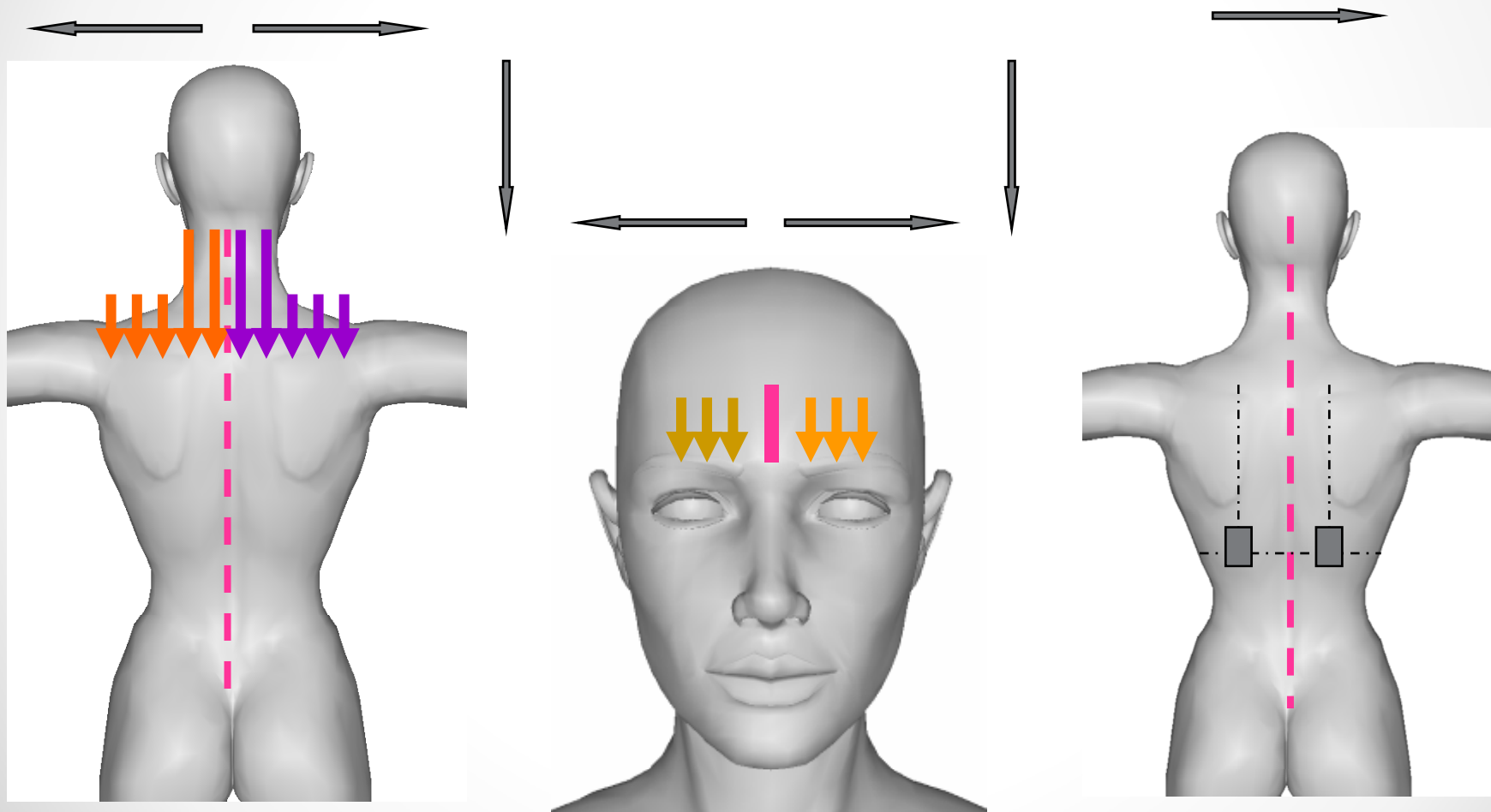
Unfavorable environment

Professional training, involving too long time in front of video monitors too close to the eyes. When the body development is not completed yet, myopia develops easily and its progression becomes persistent.

Periorbital Zone



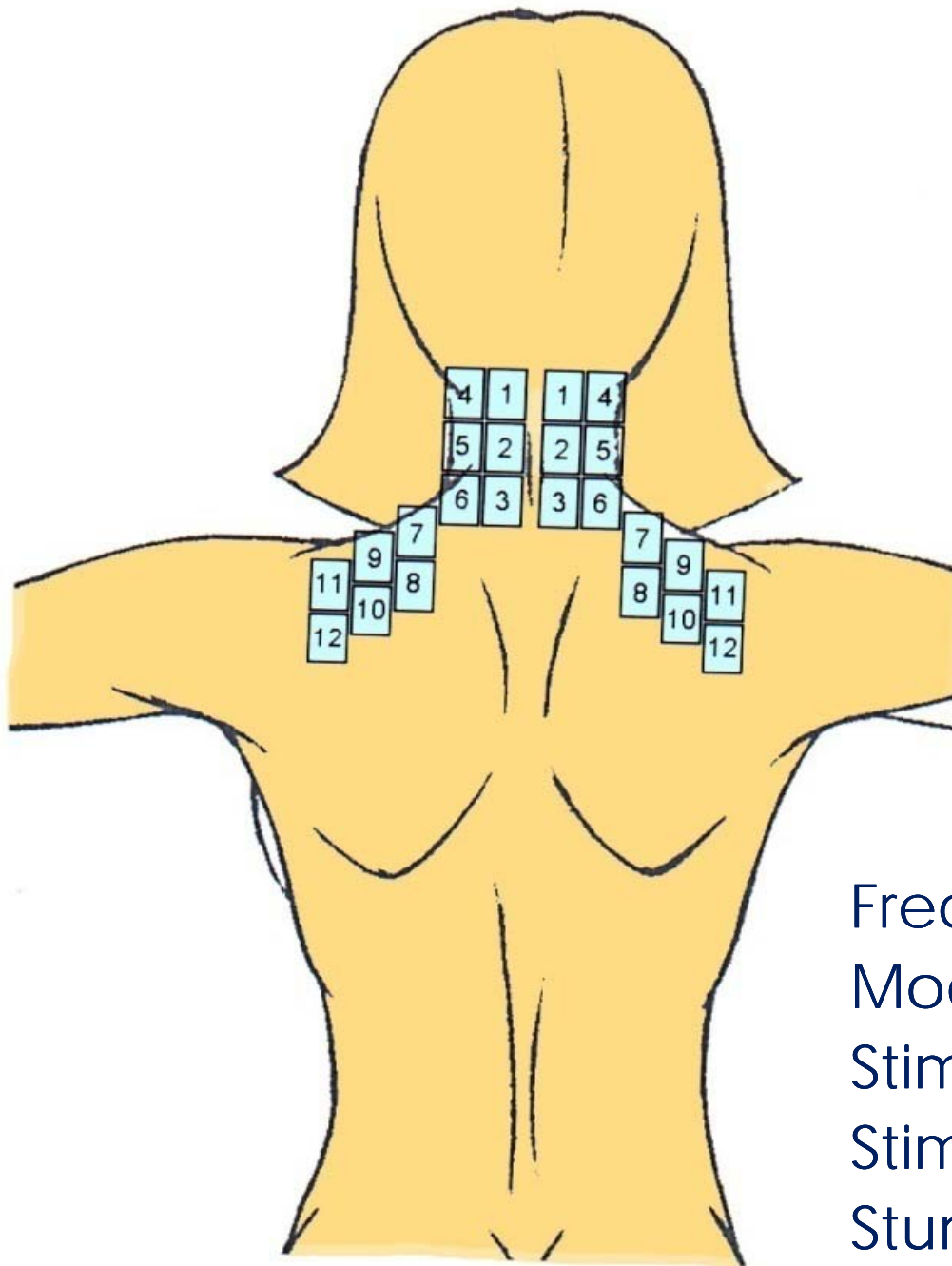
Collar Zone D-0



Collar Zone D-1



It is recommended to use paravertebral pawns.



Frequency – **60 Hz.**

Mode– **SDM.**

Stimulation level – **comfortable.**

Stimulation technique – **labile.**

Stimulation time – **3-5 min.**



Treating with the ophthalmologic electrode

For CHANS-SCENAR devices

<i>Frequency</i>	<i>60 Hz</i>
<i>Modulation</i>	<i>AM 3:1</i>
<i>Time</i>	<i>3 min</i>
<i>Stimulation technique</i>	<i>Stabile</i>

For SCENAR-NT devices

<i>Frequency</i>	<i>FM</i>
<i>Modulation</i>	<i>AM 3:1</i>
<i>Int.- 3</i>	<i>Gap-40</i>
<i>Time</i>	<i>3 min</i>
<i>Stimulation technique</i>	<i>stabile-labile,</i>



DO NOT FORGET to set the minimum stimulation strength before placing the electrode on the skin.

In implementation (+) of the action, both local reflex mechanisms and general response of the body to the stimulation are involved.

Local effects of pulse current manifest themselves as activated blood microcirculation and improved tissue trophism not only locally in the zone of influence but also in the eyeball (as it is the organ corresponding with this skin area) on the principle of dermatovisceral reflex.

Tonographic data proved normalization and/or prevention of microcirculatory-circulatory hypoxia in nearsighted children.

Electric pulse stimulation with SCENAR was delivered once daily for 10 days.

SCENAR-therapy was given at the Eye Health Care Office and Eye Department of the District Children's Hospital.

Improvement in microcirculation makes a morphofunctional basis for antihypoxic and anti-edema action, stimulation of metabolic and redox processes as well as reflex-relaxing effect of the method.

Stimulation was applied on peripheral zones that have biologically active points of the Chinese meridians associated with the functional state of the accommodative apparatus of the eye and retina electrogenesis.

Methods

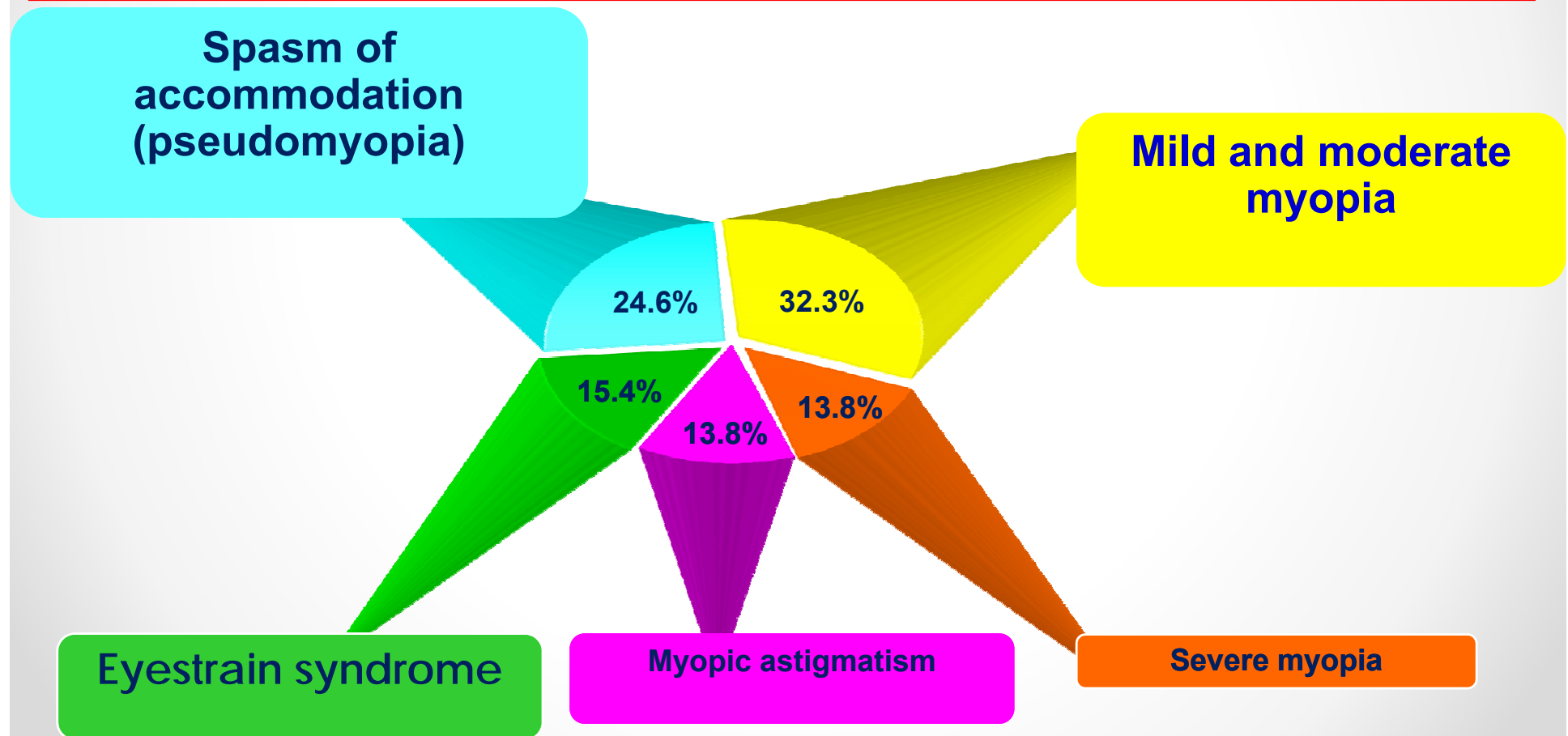
- ➡ Identification of a concomitant somatic pathology
- ➡ Identification of burdened family background
- ➡ Visometry
- ➡ Refractometry
- ➡ Accommodation indices (accommodation reserve)
- ➡ Ophthalmoscopy (examination of the back part (fundus) of the eye)
- ➡ Neurophysiological measurements (electrophysiological study)
- ➡ Echobiometry (measuring the shape of the eyeball)

Clinical Profile of Patients

65 children aged 7 to 15

Treatment was given at the Eye Health Care Office and Eye Department of the District Children's Hospital.

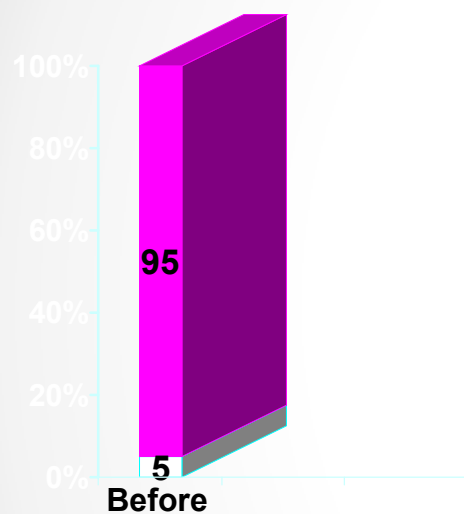
Clinical forms of eye pathology in the groups under test



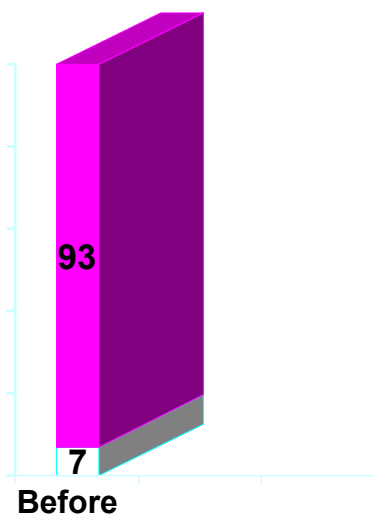


Changes in visual acuity without corrective lenses

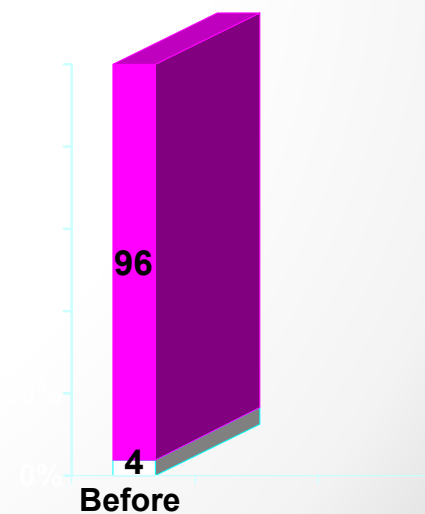
**Group I -
conventional management**



**Group II –
monotherapy with SCENAR**



**Group III –
multiple treatment + SCENAR-
therapy**

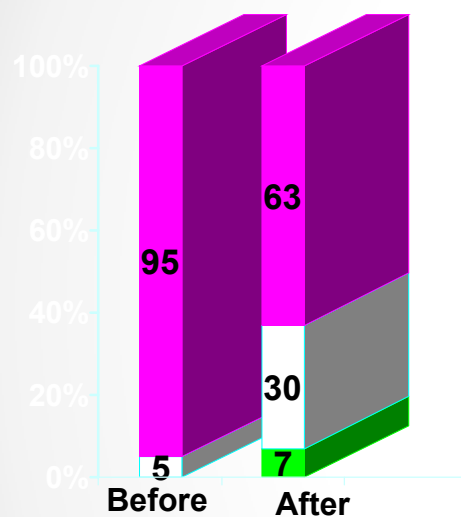


- Low visual acuity (<0.1-0.3)
- Comfortable visual acuity (0.4-0.6)
- High visual acuity (0.7 and higher)

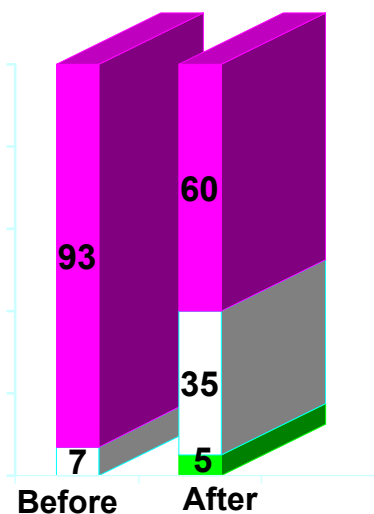


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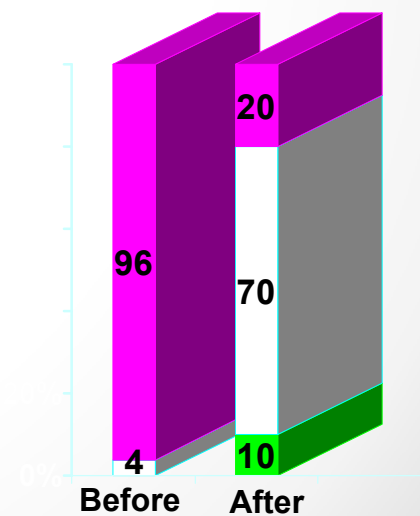
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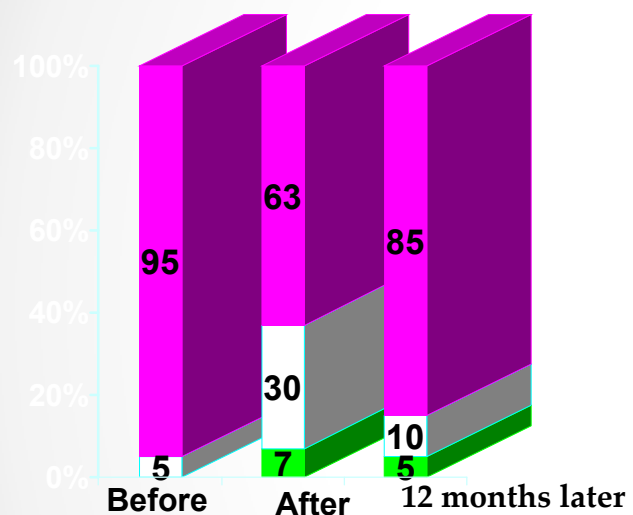


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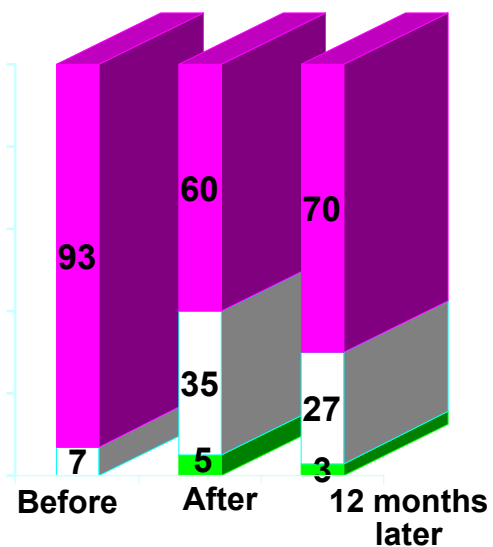


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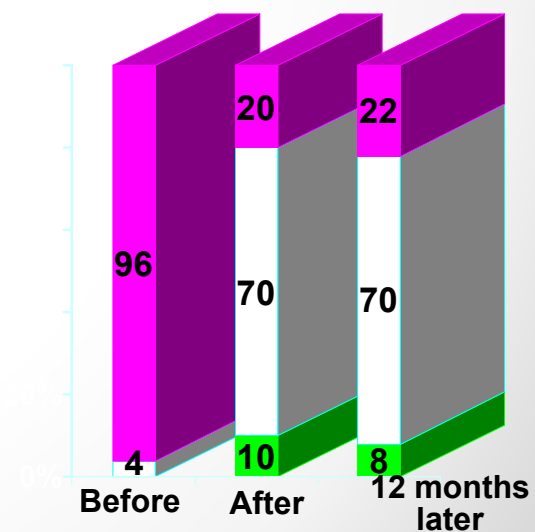
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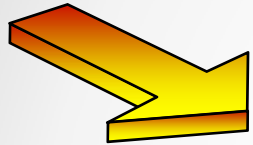


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Changes of Neurophysiological Indices

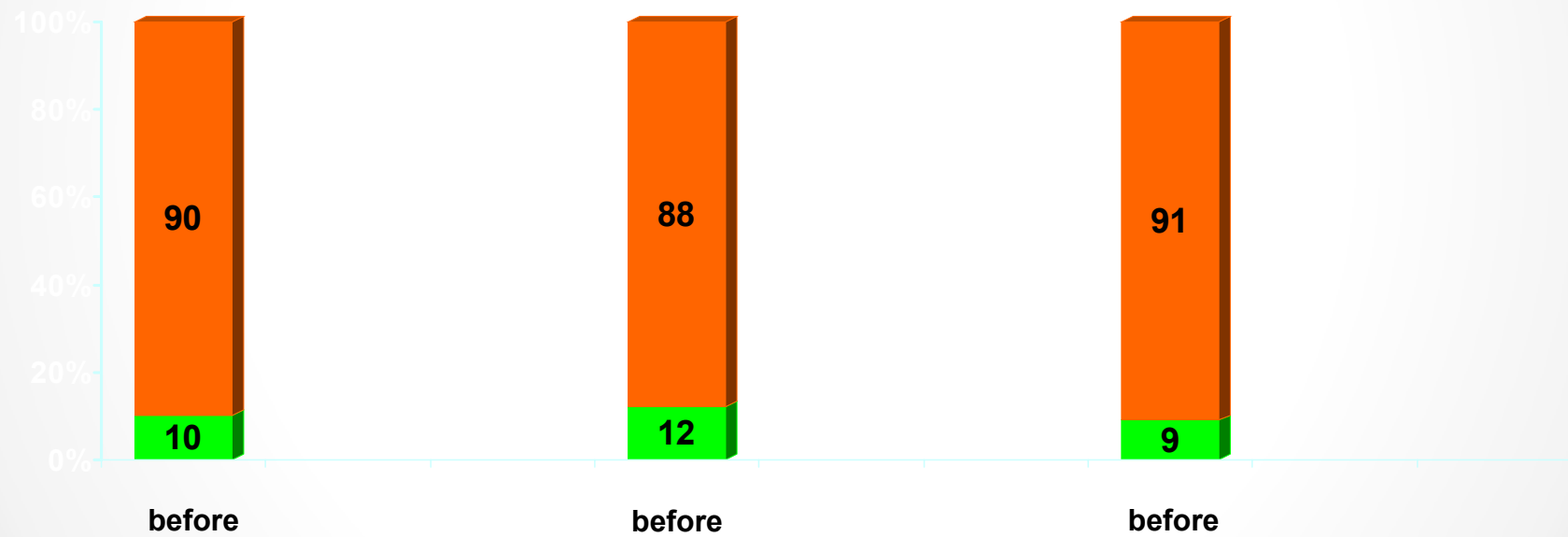
Retinal Electrosensitivity



Group I

Group II

Group III

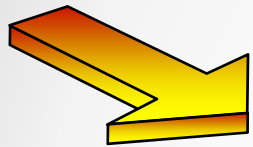


■ > 70 μ A
■ $\leq 70 \mu$ A (normal)



Changes of Neurophysiological Indices

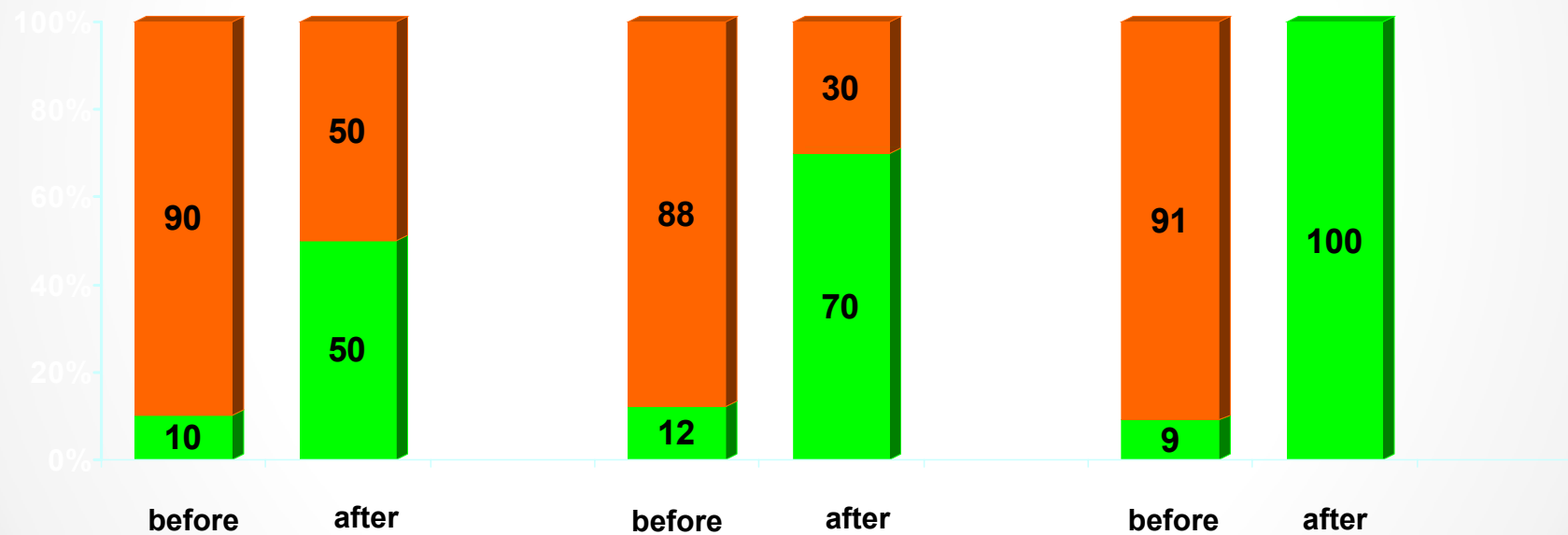
Retinal Electrosensitivity



Group I

Group II

Group III

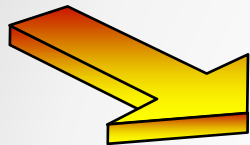


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Changes of Neurophysiological Indices

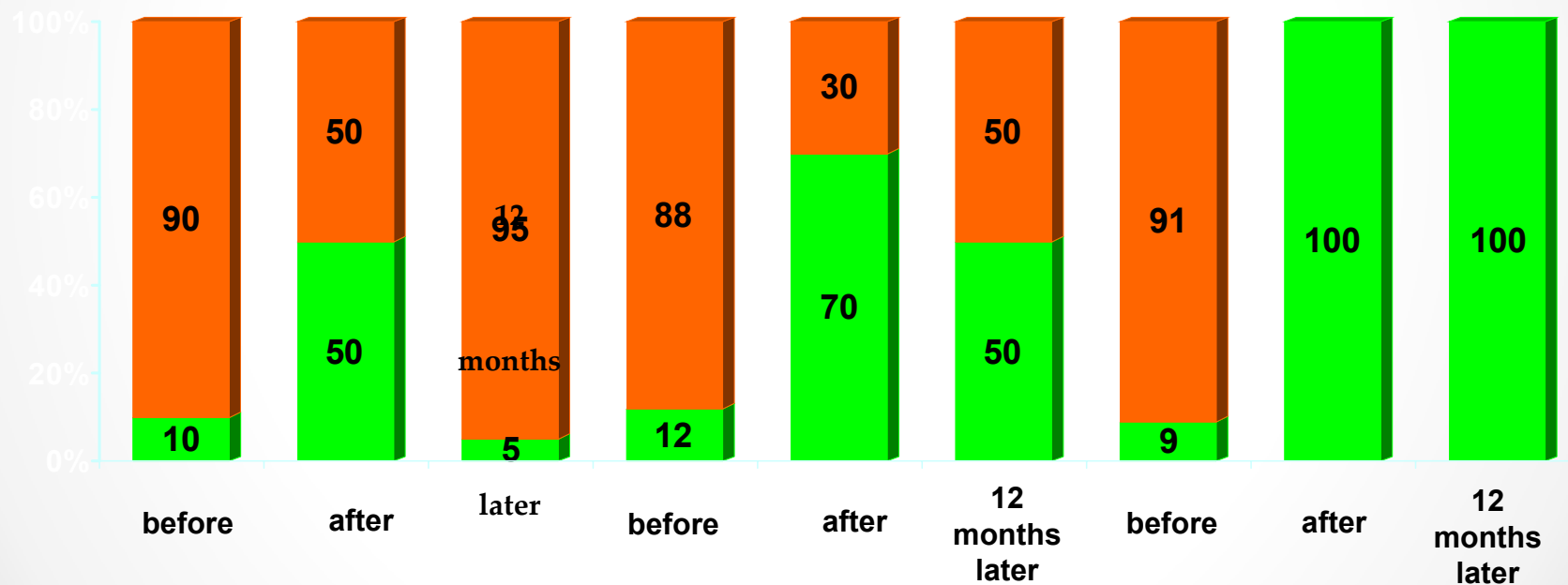
Retinal Electrosensitivity



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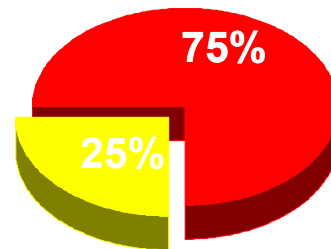
CHANGE OF ACCOMMODATION RESERVE

Accommodation Reserve:

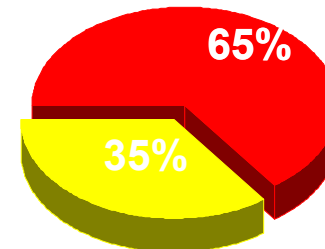
-  no reserve (0 – 0.25 dioptres)
-  low reserve (up to 1.5 dioptres)
-  normal reserve (3.0 dioptres and higher)

Before treatment

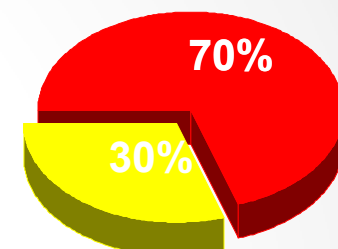
Group I



Group II






Group III





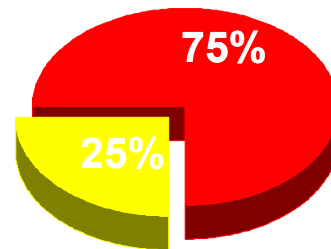
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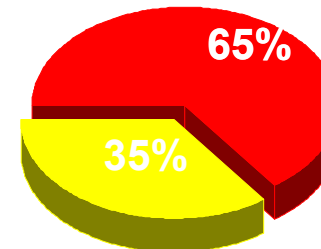
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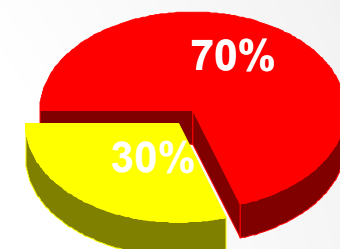
Group I



Group II

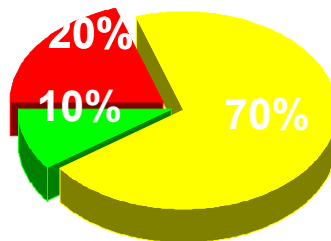


Group III

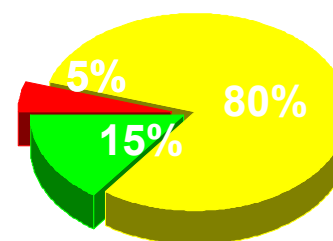


After treatment

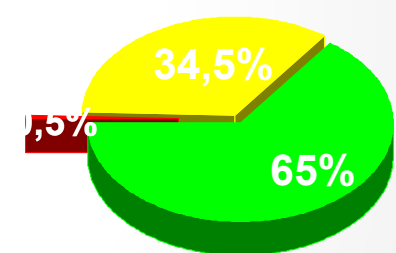
Group I



Group II



Group III





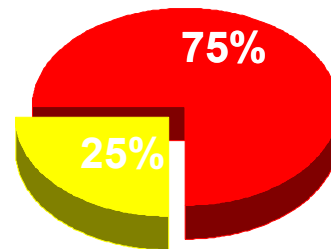
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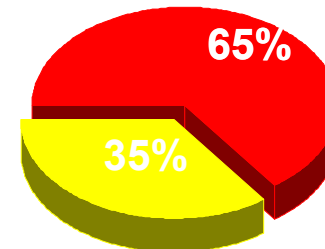
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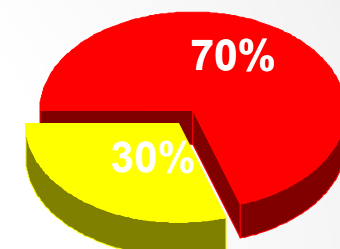
Group I



Group II

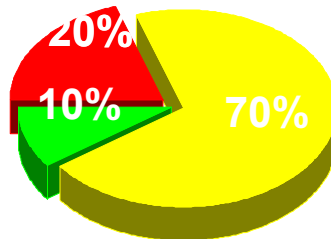


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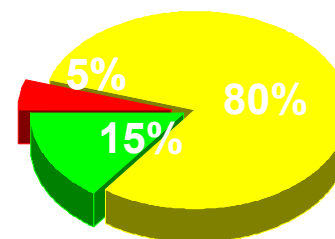


After treatment

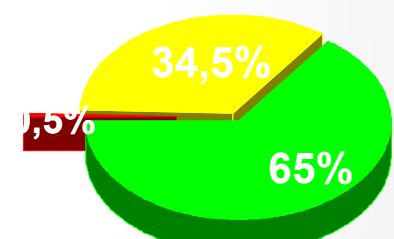
Group I



Group II

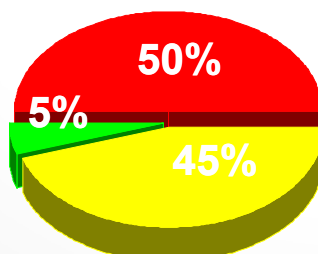


Group III

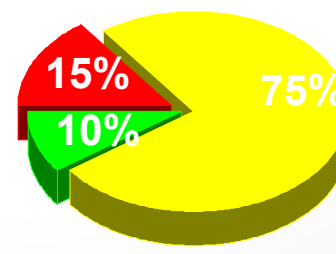


12 months later

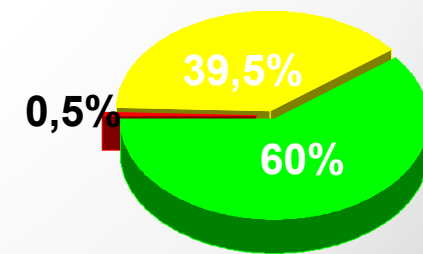
Group I



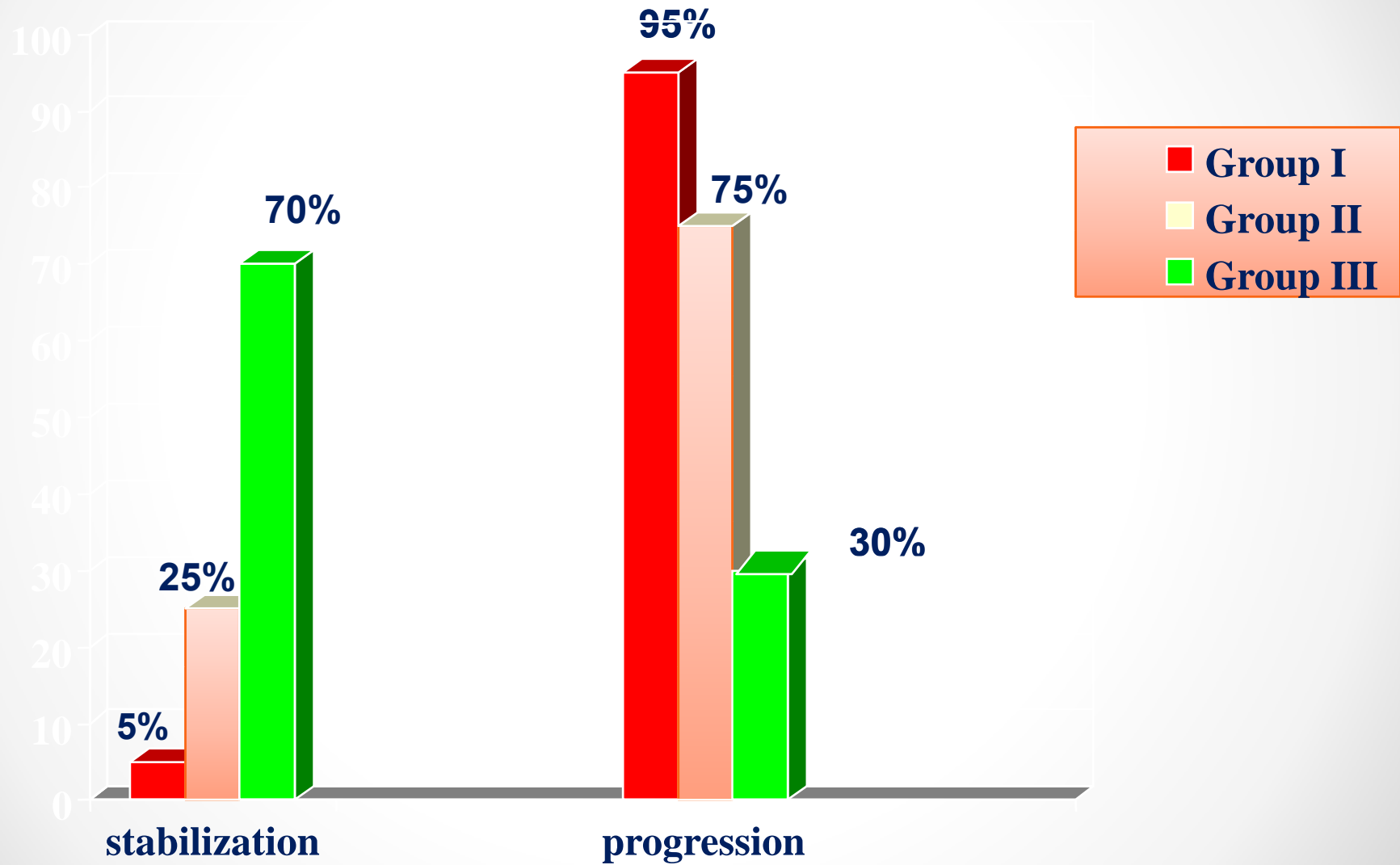
Group II



Group III



Myopia progression after 12 months



Long-term effects of SCENAR-therapy (12 months later)

Beneficial action of SCENAR in nearsighted children:

- In 78% children their vision acuity remained in the visual comfort limits
- Neurophysiological indices became normal in 100% cases
- Functional state of the accommodative apparatus became normal in 60%

CONCLUSION

High therapeutic effect of SCENAR therapy technique, if pathology of visual analyzer is there, makes the method quite perspective for treatment of myopia among children

Including SCENAR-therapy in the conventional management prevents myopia in 80% cases and stops myopia progression in 70%.



Thank you!