Lex Janssen Opticien

# Janssen Method

A procedure which enables the relationship between supplementary nutrients and the development of Macular Degeneration to be accurately monitored through a system of measurements. The calculations show that development of the eye disease for sufferers of this disease who use supplementary substances can be held in check, which can ultimately lead to improvements in visual acuity.

By receiving and reading this document and subsequent pages, you declare that you are aware of the fact that confidentiality must be observed. The Janssen Method is the creation of Lex Janssen, who in 2009, as an impassioned optician, developed a testing and working method by which to quantitatively establish the relationship between supplementary nutrients and Macular Degeneration with the aid of existing techniques. To this end, he has carried out exhaustive investigations in his optician's practice with the permission of his clients. Furthermore, he has written a protocol to this effect which has been registered as a method developed and authenticated by him, entitled: the Janssen Method.

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# Contents

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# Preamble

With a bit of brains, a little research and a portion of logical thinking, humans can come a long way. The Venlo-based optician, Lex Janssen, developed a method which enables the build-up of macula pigment in Macular Degeneration to be accurately monitored. What's more, his calculations show that for some people, there really are ways in which the disease can be kept in check and improvements to be brought about in visual acuity. Nevertheless, scientific investigation will now show whether the 'Janssen Method' can be actually used as a valid method of testing.

## NUVO

The professional trade organisation for opticians in the Netherlands, the NUVO, has signed an agreement of intent with the Venlo-based optician to this effect. If the researchers arrive at the same conclusions over the coming months, the fact that a small independent optician in Venlo has made a discovery of global significance will be official.

"At that point, they will be allowed to adopt and distribute the Janssen Method, as long as I receive the credits. At least that way I will be able to say I have done something for mankind", says the optician. In fact, the method of calculation is so simple (for the professional), that you wonder why no one has come up with it before. But of course, that's often the case with spectacular new discoveries. "In whatever event, the method of calculation is an interesting one and one that helps people with Macular Degeneration. What will now be done is to investigate whether the method really does pass the test scientifically. Of course, that is the hope. We are now at the stage when we'll be looking at where and by whom it will be done", Marc Asselbergs, chair of the NUVO, responds.

## Scientific research

"Someone with Macular Degeneration now attends an annual hospital appointment where the conclusion is that the eyesight has deteriorated yet again, even though substances are available to diminish this.  But fair's fair, everything focuses on slowing down the process of degeneration", says Janssen.

"It's all about the build up in the pigment layer in the macula of the eye. This layer becomes increasingly thinner with age. This is the dry form of MD. Over the coming years, this form of the disease will become more prevalent, purely and simply because we are living longer. The wet version is the aggressive form of the disease, caused by leaks in the blood vessels of the macula. This version of the disease also occurs in younger people."

Nevertheless, it is possible to hold the disease in check. Take the nutritionally enriched eggs supplied by Nelissen poultry farm in Oirlo. The poultry farmer has received various awards for his enriched macula eggs, which contain large amounts of Lutein. "There are natural remedies too, but the medical world has always had an aversion to these. Perhaps unjustly, because for the last three years or so, Macushield has been produced by the firm of Macuvision. "That has produced spectacular results. For large numbers of people with Macular Degeneration, its progression has been delayed or even halted. Some sufferers have even shown a slight improvement. But of course, there are always people for whom it doesn't work."

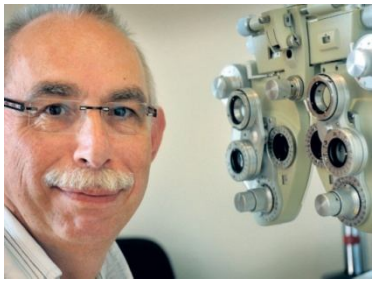
**Janssen Method**

In fact "work" must be placed between quotation marks because now, for the very first time, that has to be proven by the 'Janssen Method'. "The idea is quite simple. Sufferers of Macular Degeneration cannot discern differences in contrast easily. For that reason I started measuring contrast and established a relationship between this and the thickness of the macular pigment. For every client I can record the structure of the macular pigment and the change in contrast diagrammatically, and whether we can stop or delay the progress of MD or even improve the situation", explains Janssen. "I discovered a new application which every optician will soon be able to use, as long as the test results are interpreted and used in the right way."

The next few months will determine whether all this Is possible. "I know the 'Janssen Method' works. But who's plain old Mr Janssen from Venlo anyway? In six months' or a year's time the results of various studies will be made known. At that point, we should be able to say, "Yes, Mr Janssen really did know what he was talking about."

Venlo, 2011

Lex Janssen, Optician



# About Macular Degeneration and improvement

*Macula* is the Latin word for 'spot' (plural: *maculae*; adjective: *maculeus*). The term is used in dermatology to indicate a discolouration of the skin without the skin being elevated or depressed, or changed in any other way. In ophthalmology, macula refers to the yellow spot in the eye.


This yellow spot (*macula lutea*) is an area at the rear of the retina where only cones can be found in the light sensitive layer. These retinal cones are the sensory cells which enable colours to be discerned (there are also rods but these cannot discern colours). The yellow spot is responsible for the central part of our field of vision, that is, the area on which we focus our eyes.
The yellow spot - as focal point of the ocular lens – is the area in which the finest details can be observed. Acuity of vision is the sharpest at the centre of this, called the *fovea centralis*: the point almost immediately behind the lens which occupies an area no greater than one square millimetre. The cones are only able to function if it is not too dark.

During the day, for example, when the light intensity is sufficient, the yellow spot is the area which is most important for observing the finest details. At night – a low light intensities – only the rods are able to discern any light. At that moment, it is no longer possible to see in sharp focus anymore: if a person's vision is focused directly on an object, the rays of light are registered in the yellow spot in the retina. Because there are no rods here, vision will be blurred. If we rest our gaze slightly away from the object, the light rays will be registered on the area next to the yellow spot. Here, rods can be found so that it is possible to see more details. If we wish to observe a faint star in the night sky, this can be best done by resting one's gaze slightly adjacent to it.

## Pigment layer

The macula contains a layer of pigment which filters existing daylight, that is the blue light, from the spectrum. The extent to which this blue light is filtered out depends on the thickness of the macula pigment layer. Because of the thinning of the ozone layer, more and more light needs to be filtered, which means that the thickness of the macula pigment layer has an increasingly greater influence on our visual capacity.
The effects of sunlight are also responsible for the development of free radicals in our blood. However, the macula pigment layer neutralises the influence of these free radicals because this layer naturally contains antioxidants.

Free radicals 'attack' the macular cells, which in turn change into free radicals and attack other macular cells. In this way, free radicals are able to bring about destructive chemical chain reactions in the macula. Antioxidants can impede this process without themselves becoming free radicals.
Free radicals therefore, are able to drastically damage the macula pigment layer if this layer contains too few antioxidants. Carotenoid antioxidants, such as Luteine, Zeaxanthin and Meso-Zeaxanthin, destroy these free radicals in the macula without them becoming free radicals themselves.

So the free radicals and the blue light cause the macula's pigment layer to be less effective, which results in age-related Macular Degeneration. An overabundance of blue light will limit our ability to discern contrast.

Our visual capacity depends on a number of factors. The most important of these are visual acuity (e.g. the ability to see letters at a certain distance) and contrast (e.g. the ability to differentiate between a pavement and the road, or text and background). Often, a person's vision may be good, but they may complain about it being blurred or poor.
The cause of this is the contrast, i.e. the ability to make out contrasting shades is worse than normal. A pair of sunglasses which helps filter out the blue light enables us to discern the contrast more easily.

## Prosopagnosia

The food we eat contains a number of substances (Lutein and Zeaxanthin), which are converted in our bodies by a specific enzyme into Meso-Zeaxanthin. These three antioxidants are responsible for ensuring that the macula continues to function normally because of their protective effects against free radicals.

Lutein and Zeaxanthin are situated mainly in the peripheral part of the macula, whilst Meso-Zeaxanthin is found primarily in the centre of the macula and is the only one of the three antioxidants with has the quality of being able to thicken the pigment layer (increase in size). However, the effects of this specific enzyme diminish over time (through unknown causes), as a result of which the density of the macula pigment decreases.

Age-related Macular Degeneration has its greatest impact on the centre of the macula, whilst the non-age-related variant, Exudative Macular Degeneration affects the whole of the macula. The older we get, the greater the chance of contracting Age-related Macular Degeneration, although it is a development which affects certain individuals more than others.
A 50-year old person may suffer from Macular Degeneration, whilst another person might remain spared for the rest of their lives.

The thinner the macula pigment becomes, the greater the impact it will have on our visual capacity. The ability to discern colour and contrast and the acuity of our central field of vision diminish as the density of the macula lessens, whilst night-blindness deteriorates considerably. In the long term, this decrease in density can even lead to central prosopagnosia (an inability to recognise faces).

## Food supplements

The use of food supplements containing antioxidants such as Lutein, Zeaxanthin and Meso-Zeaxanthin facilitates the thickening of the macula pigment layer. The result is better filtering of the blue light in the spectrum so that colour and contrast can be more easily discerned, acuity of vision increases and night-blindness diminishes. Additionally, a denser macula also provides better protection against free radicals because the concentration of antioxidants is higher than in a thinner macula.
The effects of Meso-Zeaxanthin in the macula can be demonstrated by measuring contrast. The better the contrast, the better and the denser the macula.

## Baseline measurement and follow-up

By taking a contrast reading prior to the use of Meso-Zeaxanthin and comparing this to a reading taken 3 months after the food supplement has been first used, it is possible to demonstrate that the macula pigment has increased in density (and any resulting increase in visual acuity).
Our experience is that there is a significant build-up in macula pigment over the first 3 months. After the first 3 months, the macula pigment will increase in density at a slower rate even though density will continue to increase as an effect of using the nutritional supplement.
The following contrast reading is taken 12 months after the food supplement was first used, and then each year after that. These contrast readings give us an objective picture of the way in which Meso-Zeaxanthin influences the macula.

## Contrast readings and visual acuity

Based on our own experience, there is an increased perception of contrast and even a slight improvement in visual acuity when nutritional supplements are taken with some consistency. We are able to portray this correlation graphically.

In particular, for those with Age-related Macular Degeneration, Meso-Zeaxanthin has a major influence on the development of the macula, because the pigment in the centre of the macula has already been affected amongst these individuals. For those with the non-age-related variant, the effect of nutritional supplements is so far unknown.

For persons with Age-related Macular Degeneration, the contrast readings have shown objectively that the speed of macular degeneration is retarded and even halted. In a few cases, there was even said to be a slight improvement in the ability to perceive contrast and a subsequent improvement in visual acuity.
For people for whom it can be genetically proven that they have a greater chance of contracting Age-related Macular Degeneration, preventive use of Meso-Zeaxanthin can be recommended.
If someone stops using the food supplement, after about 6 weeks, the pigment build-up in the macula once again disappears. So, if the macula receives no extra nutritional substances, the eye will use up the pigment layer that has built up.

# The Janssen Method

The Tomey TCP 3000P is used for the Janssen Method.
This is a modern sight tester in the form of a highly contrast-sensitive and high-resolution 22" LCD monitor and computer. The monitor is linear polarised.
The Tomey TCP 3000P offers a wide range of testing possibilities. In the Janssen Method, use is made of the following Tomey TCP 3000P tests:

- Letters
- Numbers
- E charts
- Landolt rings
- Figures for children
- Animations
- Astigmatism and astigmatic mirrors
- Amsler test
- Contrast Sensitivity Test
- Low vision (ETDRS)
- Ishihara colour test/100 HUE
- Polarise red/green
- Forie tests
- Schober test


**Contrast sensitivity**

Contrast enables us to differentiate objects from their background, or to discern objects which have a different level of light intensity from each other.
Through contrast sensitivity it is also possible to see the difference between the colours in which a text has been printed and the background on which it is printed. Contrast sensitivity is extremely important in enabling us to distinguish details.
Two objects which differ only minimally in contrast are often difficult to separate from each other, especially if the surroundings are not adequately illuminated. At lower light intensities this ability to discern contrasts becomes less.

Every day we are confronted by dozens of situations where contrast sensitivity matters: a poorly lit staircase whose individual steps are difficult to make out; a pair of glasses lying on a table; or a white cup and saucer on a white tablecloth; etc.

In situations where there is diminished contrast sensitivity it becomes more difficult to read a paper, whilst reading a big bold printed txt on a bright white background will be much easier. For someone who has a reduced contrast sensitivity it is difficult to identify an object on a brightly coloured tablecloth or to see how much milk there is left in a white jug.

Special filter glasses can often help improve a diminished ability to discern contrast. Good lighting can improve contrast as well. Adaptation of the surroundings can also help to compensate for this lack of sensitivity and so make everyday actions more comfortable and safer to perform (a white plate on a red tablemat is much more easily discerned than on a white tablecloth; a glass with a coloured rim or with a printed design is more easily discernible than a transparent glass with very little contrast).

**Why are Contrast Sensitivity Tests so important?**

It's often thought that the popular optotypes are the best way of testing vision. Most tests however, only measure the ability to differentiate black letters of varying sizes against a white background. This means the test situation invariably means a high contrast resolution. Nevertheless, there are many situations that occur in everyday life with a low contrast resolution. Individuals who have a low contrast sensitivity may well be able to read the small letters on the eye chart, but they still have difficulty in discerning objects in a dark room and/or seeing at night time.
Only standard letter tests in combination with the Contrast Sensitivity Test can provide comprehensive information about acuity of vision, refractive errors and the visual condition of the subject.

The Contrast Sensitivity Test also enables us to detect various different diseases such as cataracts, glaucoma, amblyopia (also known as lazy eye), AIDS, Alzheimer, Macula Degeneration or diabetes.

# Method of measurement

Before starting a course of Macushield, the nutritional supplement, a first contrast reading is taken. This is the reference value (the so-called baseline measurement).
The second reading is taken after 3 months and the third after 12 months.
Over a period of 15 months, there are therefore 3 measurements.

The last two readings will usually show some improvement in the restoration of the macula, particularly in the finer values. One can conclude from this that there is a build-up of the macula pigment. If the values measured are the same as the reference values, there has been no deterioration. This too is a positive result for the subject.
Each subsequent year, a control measurement will be made. As long as the subject continues to use Macushield, they will receive a print-out of all the readings.

**Constancy important**

When readings are taken we have to be aware that the conditions must be identical. An important environmental factor which can influence the readings when measurements are taken is the light. By creating an environment which is constant in terms of light (the key factor), the time of day, the space, the distance to the monitor, test, etc., we are able to establish a basis for consistent measurements and accuracy in the comparisons we wish to make.

**First reading (baseline measurement)**

1. anamnesis
2. entry of client number
3. objective/subjective refraction
4. set refraction value in testing glasses
5. visual acuity OD/OS
6. start contrast measurement

**Reading after 3 months**

1. anamnesis
2. entry of client number
3. objective/subjective refraction
4. set refraction value in testing glasses
5. visual acuity OD/OS
6. start contrast measurement

**Reading after 12 months**

1. anamnesis
2. entry of client number
3. objective/subjective refraction
4. set refraction value in testing glasses
5. visual acuity OD/OS
6. start contrast measurement

**Control readings each subsequent year**

1. anamnesis
2. entry of client number
3. objective/subjective refraction
4. set refraction value in testing glasses
5. visual acuity OD/OS
6. start contrast measurement

**How the Contrast Sensitivity Test works**

For contrast readings, use is made of the Contrast Sensitivity Test in the device. For each eye we give the subject 40 images to look at. The subject has to say which direction the test figure is facing:

for the right eye: left, vertical, right
for the left eye: down, horizontal, up.

The test images are presented randomly. This enables us to take multiple objective readings. This method of measuring makes it impossible for both the subject and the investigator to predict which picture will be shown. At the same time, the level of difficulty of the test increases on a linear basis.
After being shown 40 images, the subject becomes tired and concentration levels decrease. This will affect the accuracy of the testing, so it is important to stop when 40 images have been shown.
At this point, we switch to taking measurements for the other eye.

It's possible of course to present 80 images for one eye only as this will increase the accuracy of the test. However, this accuracy is counteracted by the tiredness and the decreased concentration levels on the part of the subject.
For this reason, 40 images are shown to the right eye and 40 to the left.

The Contrast Sensitivity Test (CST) shows circles with sine-wave grids in five spatial frequencies, each with eight levels of contrast sensitivity. To make the test more reliable, the grid (vertical, horizontal, at an angle of 15 degrees clockwise or counter-clockwise) is shown completely randomly.

The test consists of two parts:
The vertical test (fig.1)
The horizontal test (fig.2)

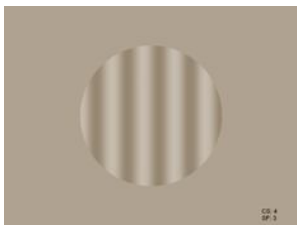


fig. 1

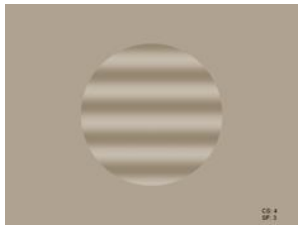


fig. 2

## Starting and finishing the Contrast Sensitivity Test

1. Press the **'report'** key on the remote control.
2. Enter the unique client number (the first four digits of the date-of-birth and the first three letters of the family name)
3. Finish with **'ok'**
4. Then press the **'contrast'** key.
5. Start the Contrast Sensitivity Test.

Vertical part:

1. The first circle is displayed. The subject identifies the direction of the grid and specifies this:
   stripes towards right (fig. A), vertical (fig. B), left (fig. C).

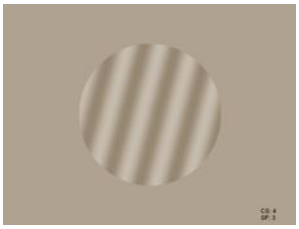


fig. A

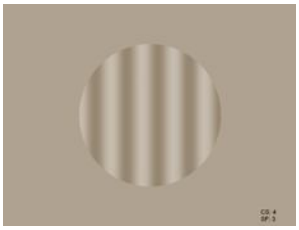


fig. B

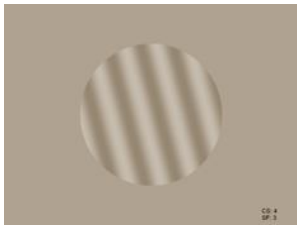


fig. C

2. Press the → key if the answer is ***'right'*** (fig. A)
3. Press the ← key if the answer is ***'left'*** (fig. C)
4. Press the ↑ or ↓ key if the answer is ***'vertical'*** (fig. B)
5. Press on the **NO/-** key if the answer is ***'don't know'***

It is important that the investigator notes down the exact answer of the subject, **even when this is incorrect**. Only then can the test results be reliable.

Each answer entered is confirmed by an acoustic signal. This procedure should be followed throughout the test. The information about contrast sensitivity and spatial information of the picture being shown at that moment is indicated in the bottom right-hand corner of the Tomey monitor.
The test begins with the lowest spatial frequency and continues though 8 different levels of contrast sensitivity.

On the vertical part of the test has been completed, the following message appears:

**End of first part of test Press OK to finish or other key to continue**

Pressing **'OK'** completes the vertical part of the test. Press a random key to start the horizontal part of the test.

Horizontal part:

1. The first circle is displayed. The subject identifies the direction of the grid and specifies this: stripes down (fig. A), horizontal (fig. B), up (fig. C).

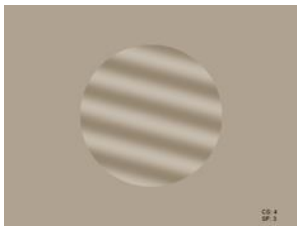


fig. A


fig. B

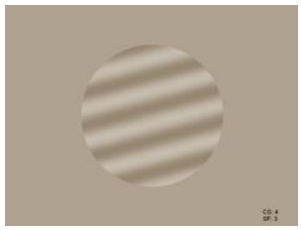


fig. C

2. Press the ↓ key if the answer is ***'down'*** (fig. A)
3. Press the ← or → key if the answer is ***'horizontal'*** (fig. B)
4. Press the ↑ key if the answer is ***'up'*** (fig. C)
5. Press on the **NO/-** key if the answer is ***'don't know'***

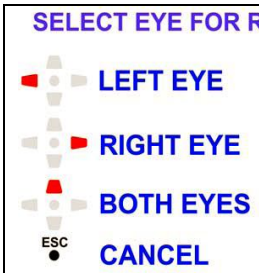
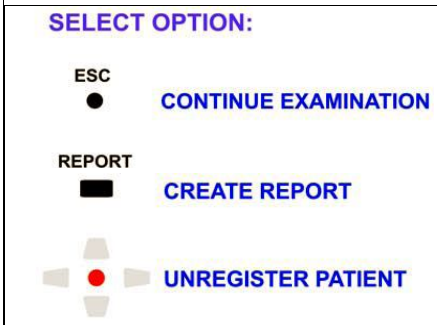
It is important that the investigator notes down the exact answer of the subject, **even when this is incorrect**. Only then can the test results be reliable.

Each answer entered is confirmed by an acoustic signal. This procedure should be followed throughout the test. The information about contrast sensitivity and spatial information of the picture being shown at that moment is indicated in the bottom right-hand corner of the Tomey monitor.

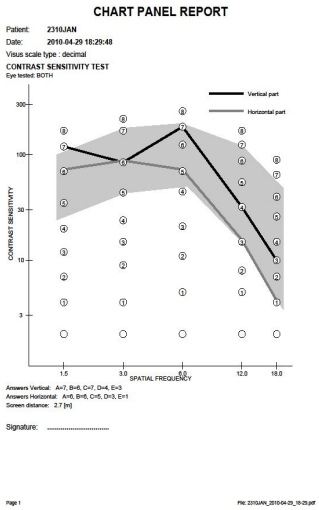
The Contrast Sensitivity Test is saved by pressing the **'report'** key.

## Saving the Contrast Sensitivity Test

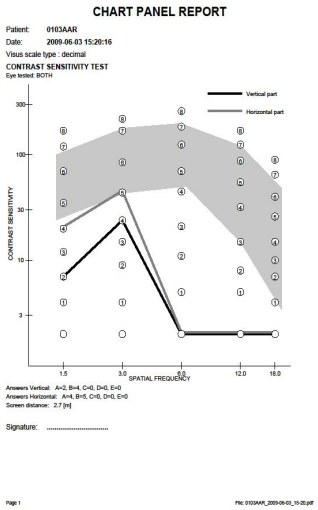
If the Contrast Sensitivity Test has been carried out in line with the instructions above, press the **'report'** key. The following message will then appear on your Tomey monitor:
Via the "menu > reports" key, it's possible to print out the CST rapport and save if required on a USB stick. The Tomey TCP-3000P can also be connected up to a network.

| | |
|---|---|
|  | Press the **'report'** key<br>The message **'SELECT EYE FOR REPORT'** appears.<br>Then select the eye concerned: right/left/both eyes. |
|  | In order to save the results of the test, and to continue, select **'save and continue'**. The same test can now be carried out for the other eye, or for both eyes. Another test can also be carried out. |
|  | To complete the test and to print the report, select **'save and create report'**.<br>To end the test without saving, select **'continue without saving'**.<br>To continue with the test, select **'ESC'**. |

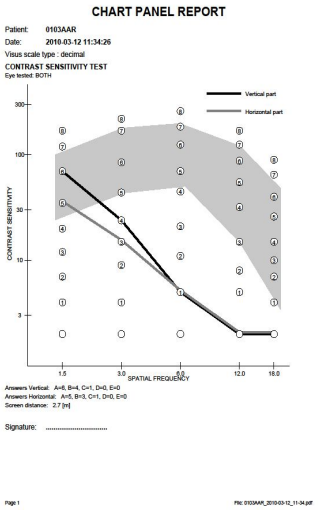
## Examples of Contrast Sensitivity Tests




**normal contrast**




**low contrast**




**build-up after one year**

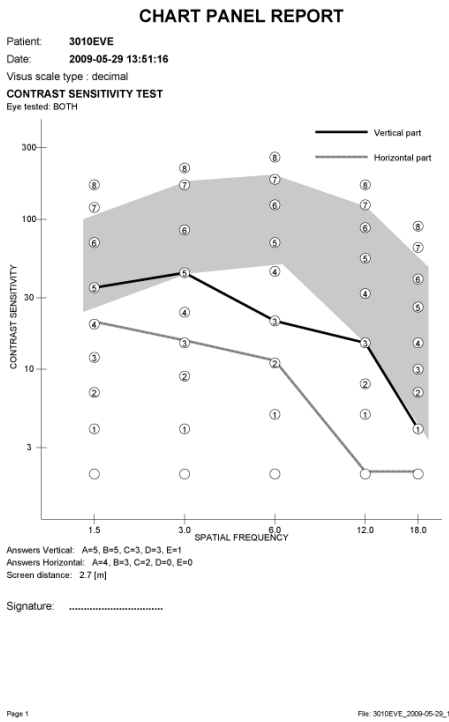
## Proven results

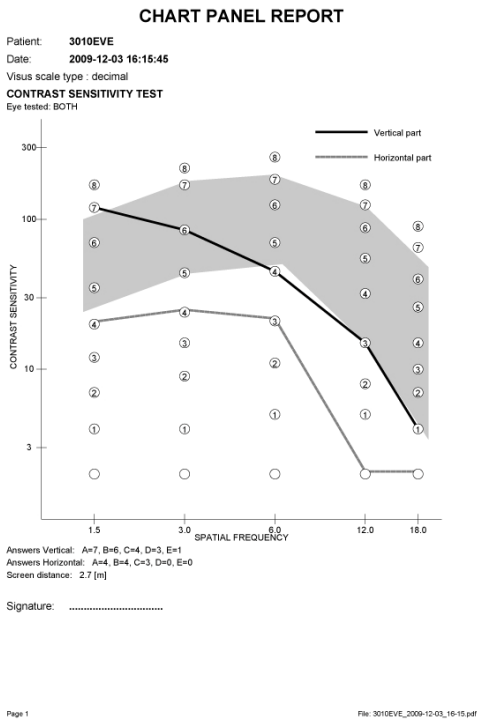
Sight is not just dependent on acuity of vision but also on an ability to discern contrast (for example, the difference between the pavement and the road). The thinner the macula pigment layer, the poorer the ability to discern these contrasts. Macushield helps rebuild this pigment layer. Contrast can be measured using the Contrast Sensitivity Test according to the Janssen Method.

The Janssen Method has been researched and used to test 72 persons over a period of around 2.5 years.
The outcome of the tests suggests that use of Macushield has had a positive effect. Of the 72 individuals tested, around 40% remained stable or experienced a slight improvement, 40% degenerated less quickly and for the remaining 20% neither positive nor negative results were recorded.

## Practical example

| | |
|---|---|
| Female subject: | born in 1935, AMD diagnosed |
| Visual acuity: | right eye 0.80 – left eye 0.40 |
| Macushield first used: | 01-06-2009 |
| Graph left: | date of reading 01-06-2009 |
| Graph right: | date of reading 03-12-2009 |




The black line in the graph is the right eye, the grey the left.

There is a clear increase in the ability to discern contrast. There is also an improvement of 5% in visual acuity. This was attained in a period of just 6 months.

**Brief summary**

| |
|---|
| 1. Anamnesis |
| 2. Entry of unique client number |
| 3. Visual acuity OD/OS |
| 4. Determining refraction value using autorefractor |
| 5. Subjective eye test |
| 6. Use of testing glasses with subjective values |
| 7. Covering up of left eye |
| 8. Start of contrast measurements |
| 9. Vertical test readings for right eye |
| 10. Horizontal test readings for left eye |
| 11. One test is sufficient for monocular vision |
| 12. For visual acuity of ≤ 0.15, have subject sit closer to test. Use same distance for subsequent measurements |
| 13. End of test and saving of test data |
| 14. Linking test data from the Tomey TCP-3000 to the client card |

# Macushield nutritional supplements

Age-related Macular Degeneration (AMD) is the most important cause of serious sight loss amongst persons over 50. Worldwide, it currently affects more than 30 million people, including 160,000 people in the Netherlands. The expectation is that number this will double by 2020.

AMD is a disease which affects the central part of the retina (yellow spot or macula), where the most details are observed and where the image is sharpest. With AMD, this sharpness disappears as a result of a deterioration in the nerve and pigment cells. In the centre of the image there will be a blurred or black spot.

Macushield is a nutritional supplement which helps increase the macula pigment and therefore lessens the chance of AMD. There are 3 carotenoids present in the macula: Lutein, Zeaxanthin and Meso-Zeaxanthin.
Macushield is the only supplement that brings these 3 carotenoids together to increase the macula pigment. The unique formula in Macushield contains the patented product Meso-Zeaxanthin. This gives protection to the central part of the macula from free radicals and filters blue light. Scientific research has shown that supplements that contain Meso-Zeaxanthin clearly increase the macula pigment.
Lutein and Zeaxanthin also help this process. The damage to pigment cells is primarily caused by blue light in the spectrum and free radicals.

**Source of Macula carotenoids**

Substances which are valuable in protecting our eyes (maculas) can also be found in our daily diet. On page 24 there is a list of the amounts of effective substances in our food.
The yellow colour (pigment) in the macula is formed by the particles Lutein, Zeaxanthin and Meso-Zeaxanthin. These substances support the condition of the eye and protect it from free radicals.
Macushield contains the patented product Meso-Zeaxanthin. This protects the central part of the Macula and brings these three particles together to give us healthy eyes and visual acuity.

| Source | Lutein & Zeaxanthin | Lutein | Zeaxanthin |
|---|---|---|---|
| Egg yoke | 89 | 54 | 35 |
| Sweetcorn | 86 | 60 | 26 |
| Kiwi | 54 | 54 | 0 |
| Seedless black grapes | 53 | 43 | 10 |
| Courgette (pressed) | 52 | 47 | 5 |
| Pumpkin | 49 | 0 | 0 |
| Spinach | 47 | 0 | 0 |
| Orange paprika | 45 | 8 | 37 |
| Yellow pumpkin (pressed) | 44 | 44 | 0 |
| Cucumber | 42 | 38 | 4 |
| Peas | 41 | 41 | 0 |
| Green paprika | 39 | 36 | 3 |
| Black grapes | 37 | 33 | 4 |
| Walnut (pressed) | 37 | 37 | 0 |
| Orange juice (carton) | 35 | 15 | 20 |
| Honeydew melon | 35 | 17 | 18 |
| Celery | 34 | 32 | 2 |
| Green grapes | 31 | 25 | 6 |
| Sprouts | 29 | 27 | 2 |
| Spring onion | 29 | 27 | 2 |
| Green beans | 25 | 22 | 3 |
| Orange juice (fresh) | 22 | 7 | 15 |
| Broccoli | 22 | 22 | 0 |
| Red Delicious apple | 20 | 19 | 1 |
| Mango | 18 | 2 | 16 |
| Lettuce | 15 | 15 | 0 |
| Tomato juice (carton) | 13 | 11 | 2 |
| Peach | 13 | 5 | 8 |
| Yellow paprika | 12 | 12 | 0 |
| Nectarine | 11 | 6 | 5 |
| Red paprika | 7 | 7 | 0 |
| Tomato (fried) | 6 | 6 | 0 |
| Carrot | 2 | 2 | 0 |
| Dried apricots | 1 | 1 | 0 |

# F.A.Q.

**What is macula pigment?**
Macula pigment is a yellow pigment which is found at the back of the eye. This pigment is prevalent in our food and protects us from external influences such as damage from light and free radicals.

**Why is it important to prevent damage caused by free radicals?**
Protection from damage caused by free radicals is important because free radicals are a probable cause of AMD (Age-related Macular Degeneration).

**What kind of nutrition contains a component of the macula pigment?**
Lutein and Zeaxanthin, two of the three components of the macula pigment, can be found in many common fruits and vegetables (for example, spinach, paprika and roughage). Meso-Zeaxanthin, the third component of the macula pigment, is converted in the eye by Lutein and is hardly found in any foodstuffs.

**Do we get enough macula pigment in our diet?**
On average we eat 1 to 1.3 mg of Lutein and Zeaxanthin per day. However this is too little to protect us from the damage caused by free radicals and light. Meso-Zeaxanthin hardly ever forms part of a standard diet.

**How much macula pigment do we need on a daily basis?**
For the 3 components of the macula pigment, Lutein, Zeaxanthin and Meso-Zeaxanthin there is no recommended daily intake, but 30 mg per day is safe and effective.

**What diet supplement contains all three of the macula pigment components?**
Macushield is a unique formula with all macula pigments, because in addition to Lutein and Zeaxanthin, it also contains Meso-Zeaxanthin.

**What happens when you take Macushield?**
Scientific studies have shown that when you take Macushield, effective levels of macula pigment are built up. In particular, it is in the centre of the macula, where Meso- Zeaxanthin is most prevalent, that pigment levels increase.

**Why should I take Macushield?**

People who should take Macushield are those who have an increased risk of Macular Degeneration (AMD) and/or have low macula pigment values. Scientific research has shown that this risk is higher in those who:

1. Have a relative with AMD;
2. Smoke;
3. have a poor diet (not much fruit and vegetables);
4. are obese.

It is important to know that you can have a deficiency in macula pigment-values from 20 years of age.

**Why is Meso-Zeaxanthin (MZ) so important?**

The importance of MZ becomes clear when we realise that only Lutein is converted to MZ in the eye.

MZ can only be found in the most central part of the macula. This is ideal because it protects the most sensitive cells in the retina. MZ is also the strongest antioxidant which filters a wider spectrum of harmful blue light. Supplementation with MZ ensures that this macula pigment is placed in the right location, namely the eye. So this does not depend on whether Lutein can be converted or not in view of the fact that some people are missing the enzyme that converts Lutein into MZ.

**How long does it take to build up macula pigment with Macushield?**

This varies from person to person, but on average about 3 months. It is important to know that the macula pigment remains at the increased level up to 6 weeks after stopping with Macushield. Afterwards the macula pigment will once again diminish.

# Information

For general questions/comments/reactions regarding this protocol, please contact (by phone or e-mail):

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