

## Orientation and Mobility training in the twilight and darkness.

Have you ever experienced that you when sudden change from light to dark, your eyes some time to adjust to the new "environmental" state? Even more annoying is it when adapting takes a long time ... then there is most probably a form of night blindness. Little test to find out if you suffer or not to nyctalopia is to visit the cinema. If you then within 5 minutes, can distinguish the person next to you everything is ok; if not work consult your ophthalmologist.

Some people discover at an early age that they are night blind, but for others it is evident in older age. Someone who is night blind can fall on simple objects and get lost. After the initial stage, in which one gradually discovers the disease, the disease will usually proceed to full night blindness. What especially in the evening is reflected and poses a serious problem. People with night blindness have great problems to estimate and distinguish both sides of the road.

An ophthalmologist can prescribe at night blindness corrected anti-reflective glass and recommend to the daytime outdoor wear good sunglasses, because the eyes don't have to get used when the sunglasses are taking off.

Clients with night blindness listen but don't hear it, they look but they don't see it. Often because at twilight and at night the sounds are different and there is another light. But also because they simply do not have the experience with these additional senses. When a client complaining about his sight in the twilight or darkness, it is important to know whether the client has an orientation problem or a mobility problem.

A client with a mobility problem is afraid to stumble or to fall from the sidewalk. With his head to run in the branches or at a great obstacle. This training will be for the confidence of the client are done mainly at night. He must surely learn to trust on his hearing, his possibly rest vision or additional equipment instead of the vision control he has by daylight.

A client with an orientation problem gets lost every time and will not reach his destination. This training can also be done during the day for a large part. It is literally to learn a route from the head (landmarks that also evenings are usable) or learn to use a GPS.

When training during daytime you can ask the client to close his eyes to exercises but especially if it is getting excited, the client will still often peek. You can then propose to use blindfolding. But the opinions about blindfolding both at clients and instructors are strongly divided. I believe that training in real darkness or twilight is the best. You are dealing with a client who has a low vision but is not blind and in my opinion you should not ask a client that he simulates that he is blind for the benefit of your workout.

There is also never been proven that blindfold training effect, and that having a rest vision would be a disadvantage in the learning. But sometimes a client wants a blindfold and ultimately the client who asks is the king. There is never proven that blindfold training is harmful.

To find out whether the client has a mobility or an orientation problem there are questionnaires for the client that he can fill in. I'm sorry that they are only available in Dutch at this moment. But much more important is your own observations of the client. Go with the client both day and evening walking the same route and observe the differences.

The main goal is that we consider the possibilities that a client still has and not of the impossibilities. That means we will see whether a client with a targeted instruction, a professional approach and a standard tool also can be safe and confident at dusk or dark. And then I count the cane to a standard tool.

Most of the time it concerns clients who don't use a cane during daylight and they don't use the information of sounds for their orientation or as basis for echolocation. Sound is rather important for blind and partially sighted persons for their orientation inside and outside. Trainers of clients lay a lot of emphasis on learning to listen to and interpret environmental sounds. By giving sounds a meaning, the client is aware of the opportunities to utilize sound as a source of information. This can happen spontaneously, but often, especially in the case of people who are night blind, specific training is needed. And then, not only to enable to listen to the traffic, but the next step is to turn the hearing in order to make use of echolocation. Not only to hear the obstacles but also to use in orientation.

Echolocation is part of the perception. Be aware of your surroundings. We learn to use the ears to explore the area. Echolocation is an added value for everyone with a visual impairment. Anyone can learn it, even clients with a hearing problem. A client with a hearing problem might not perceive anything (small objects), but other things (for example, how far you are from a wall or houses). And a visually impaired with mental disabilities might not be able to interpret what the object is but he can notice that there is an object.

Especially night blind people benefit greatly from echolocation training. By day they are able to see the bus stop across the bike path but not at night but then they would be able to hear it.

Is the client afraid to fall of a sidewalk or to walk into something? Then he has a mobility problem. Night-blind clients often have a relatively high running speed during the day because they see so much. And also do not make use of a cane. Solution is to use a cane. This occurs in any case that the client falls or stumbles of the curb. We recommend a cane which can be stepless make longer or shorter according to the situation. The Kellerer cane is an example and is also a combination of recognition and touch. This cane can also be equipped with a touch point (hard or soft), the Rover wheel or Comfy Wheel

Adjust the cane to the desired length. The correct length of the cane is somewhere between the sternum and shoulder. Better too long than too short. When a client feels unsafe the cane can be made slightly longer. Practice the standard cane techniques which I will not describe here because every instructor here in the audience should know that. Always use a route that is known in the daytime and

where the client does not (less) need to be afraid of obstacles or downward steps or curbs.

Make the client clear that cyclists and drivers in the evening also see less and that weather conditions also play a role. In dark rainy and / or foggy weather it is therefore advisable to wear reflective rainclothes, do not use hood and wipe any glasses dry before crossing. The client needs to learn by hearing to cross a street but may still visually check in the beginning. Try the client to get that far that he can cross a street only by hearing. Make the client understanding that cyclists often drive without light especially in cities. Therefore, the waiting attitude before crossing and the warning signal as is important. They can better drive or bicycle into your cane than into you.

Go standing at a not too busy road and teach the client to estimate how far the traffic is away from him and whether he still can cross. Let the client listen to what the cane him is telling (echoes of the point against the curb) and practise this frequently. This can also be practised on a square or along a row of cars. Especially for young people who fear to walk in the dark, we use the LAT training (learning apart together). Working in a pair, helping each other, learn from each other but also exercises separately.

#### Advanced equipment

Aids for obstacles detections are the Ray and K-Sonar. Both devices detect obstacles. Ray and K-Sonar are individual small devices that detect obstacles in the direction where the device is pointed. Both devices don't detect curbs but there you have your cane. Incidentally, the K-Sonar can also be mounted on the cane so that you have one hand free.

GPS can be used with clients with orientation problems. There are many apps for Android and Apple that will keep you constantly informed where you are and in which direction you should go.

The third aid which can be used is a flashlight. Mounted on the cane (and of course it should be a very light model) has the advantage that a semicircle in front of the point is illuminated and gives information about possible curbs and stairs. Especially when you know that there is a curb is to come (when crossing streets) a very big advantage. A flashlight can be used to find clues and read street name signs and house numbers. And possibly a little more of the environment in which you are walking. A third option is a lamp to wear on the head as miners do that on their helmet. When the lamp is facing down slightly illuminated the sidewalk in front of the client. The disadvantage is that it is a very strong light needs to be and then again oncoming traffic may be dazzled. And you should just want to walk with such a lamp.

Some of my students have found the solution in the mobile, quick to install lights for bicycles. A small light which gives a bright LED light. This little light can be fold around the cane so that it moves with the swinging movement of the cane. It makes you also more visible for bicycles and drivers

The last aid is the night vision goggles. A relatively limited and quite expensive aid to use in outdoor situations or in an sitting situation inside. The Felinesight is developed

with advice from instructors and in cooperation with people with night blindness. For advice and training Visio and Bartiméus drafted a protocol rehabilitation evening mobility, and special training for instructors.

The glasses provide only a limited field of vision. To have an adequate overview, the client has to scan. There is no stereo depth perception possible. This can be particularly difficult in estimating distances when crossing. It can also be very difficult descending stairs and recognizing curbs. The client has to scan more with the glasses. The Felinesight gives a monochrome image. The colour perception is absent. This results in difficult observing red or green traffic lights, observing flashing lights and harder to distinguish, for example pavement and grass.

Of course, there are clients who benefit (indoor or outdoor) with night vision goggles or other tools mentioned but that may never be the starting point of a rehabilitation or training.

As I said at the beginning: We start from the possibilities that still has a client and not of the impossibilities. That means we will find out whether a client with a targeted instruction, a thorough approach and a standard tool also can manage safe and confident at dusk or dark. And if the client remains problems than we can use more advanced equipment. And if the client is despite everything still cannot manage at dusk or dark then maybe this is a solution.



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