FUNCTIONAL VISION ASSESSMENT

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AIMS

This module aims to outline functional vision assessment via developing a:

- Systematic method for observing the effects of low vision on visual function
- Protocol for obtaining functional vision information from low vision patients

LEARNING OUTCOMES

At the end of this chapter students should be able to:

- Define functional assessment
- List factors that affect how well a person sees
- List eight areas for observation of functional use of vision
- Understand how to assess colour vision, contrast sensitivity and lighting needs and their effect on function

INTRODUCTION

The assessment of functional vision aims to determine:

- What people see
- How they can see and use their vision
- Under what conditions they can see

The information can be used to understand why people can or cannot do particular activities. The purpose is to provide information about the use of vision to plan training to enhance visual skills and maximise visual function.

Factors that affect how well a person sees include:

- Visual acuity
- Visual field
- Control of eye movements
- Light
- Colour
- Contrast sensitivity
- Age of vision loss and severity of loss
- Intelligence and cognition

Note: Visual function is far more than just visual acuity!

OBSERVATION OF THE EFFECTS OF LOW VISION

When observing functional vision be aware of:

- Visual behaviour during a variety of activities and under various conditions
- Mobility in familiar and unfamiliar settings
- The person's understanding of the implications of low vision and the adaptation of tasks for the environment that can be made
- If other senses are used effectively
- What the whole community, family or class normally do
- The effect of fatigue on visual function during long assessment sessions

The aim of observing the behaviour of people with low vision is to examine the effects of low vision for the individual.

The areas to be observed for each person include:

- How the person feels about their vision
- How vision is used
- The understanding of low vision and the special needs of the person
- The need for modifications to the environment such as lighting, contrast and use of colour.

The effects of low vision for learning, activities of daily living, mobility and social interaction may be different for each person. It is important to understand what a person can do for themselves, when they need some help or what changes can be made in the environment.

Ask questions that require a descriptive response (not just a "yes" or "no" answer).

KNOWLEDGE AND FEELINGS

- Does the person think of themselves as:
  - Being blind
  - Having some, but not normal vision (low vision)
  - Having normal vision?

- Does the person experience some of the common problems of people with low vision - feelings of frustration at not being able to do things or lack of confidence in themselves?

- How does what other people's expectation affect what the person does or can do? Do they expect her to act as a person with normal vision or is she expected not to see anything and so not take part in community activities?

- How does the person think about themselves?

- Is the person aware of the important factors such as:
  - Distance from an object
  - Size of an object
  - Contrast
  - Lighting and glare
  - How to make the changes to improve visual functioning

- Is the person aware of whether vision could be improved with treatment or whether it will get worse?

- Is the person interested in learning ways to improve visual functioning?

- Would the person wear spectacles if they were prescribed?

OBTAINING INFORMATION

- Is vision used to find out about the environment and what activities are happening or does the person wait to be told what to do?
- Are other senses such as hearing and touch used instead of, or with vision? Which sense is used first to get information - vision, hearing or touch?
- Are objects inspected as a whole object or in small parts or sections?
- Does the person move around the community by himself or does he use the help of other people?
- Does he use vision to find objects or people and then find his way using vision?

Check that they knows where to find places and objects in their village/environment. Observe how the person moves to different places and watch how they find their way.

AWARENESS OF THE ENVIRONMENT

By observing behaviour and asking questions you can find out if vision has been used to explore and learn about the common objects used by people in the community.

It is best to ask questions that require an extended answer and avoid questions that can be answered with a 'yes' or 'no'. Ask "What is your mother holding?" not "Is your mother holding a basket?"

Does the person watch activities happening close and far away and can the actions or activities be imitated?

Can all common objects in the environment be recognised by looking at them?

Can all necessary objects be located and found immediately? The objects could be for cooking, eating, working or for play. Can all the objects and how they are used be described? From what distance can this be done?

Does the person move in a restricted, small area or move freely throughout the whole area of the village or town?

INDEPENDENCE

Observe if the person can use vision to do some or all the things that other people do without special assistance.

- How is hearing and touch used to help?
- At home, do they look after all their own things?
- Can they take care of personal hygiene?
- Do they take part in all family activities?
- At school, are they aware of what other people are doing so that they can join in? Can they use the same materials as the other children do?
- At work, can they do all the jobs people are expected to do? Does poor vision affect the ability to complete jobs?
- Can they join in games and entertainment activities?

LIGHTING

This refers to either natural or artificial light both inside buildings and outside. The amount and direction of light are important for best visual functioning. The light is best coming from behind the person with low vision. The person should sit with their back to the window. People have different needs for lighting. Sometimes too much light can create glare issues but generally good light is best. The amount of light, however, cannot always be changed. A person can move to different positions to alter the amount of light from direct sunlight to shade or from a shady to a bright position. Brimmed hats and sunglasses can be used to control lighting.

- Does the person work better in bright light or in the shade?
- Does the person try to shade the eyes with a hat or a hand or turn from the sun?
- Inside, can the person work better where there is light from a door or window?
- Is there any difference in how the person can move around when it is dark, compared with in the light?
- Is vision severely affected by a change from bright to dull light or from dull to bright light?

CONTRAST

People with low vision normally have difficulty seeing objects or print that have poor contrast. Contrast is the difference in luminance or colour between two objects.

When there is good contrast with the background things are easier to see, for example, rice in a dark bowl.

Examples of poor contrast are animals which are the same or similar colour as their environment; rice, noodles or potatoes in a white bowl or plate. These are difficult for a person with low vision to see.

The effects of poor contrast can be demonstrated by using these examples and others. Choose objects and background which are the same colour or do not contrast well. For example, use a stone that is the same colour as the ground. Put the stone on the ground about 2 metres away from the person and ask them to find it. If the objects could not be seen from 2 metres, move the person closer.

Then use an object of the same size but which contrasts strongly with the ground. A vegetable or piece of fruit could be used. Put the object 2 metres from the person and ask them to find it. If the objects could not be seen from 2 metres, move the person closer. Discuss which objects were easier to find and why.

COLOUR VISION

The correct use or knowledge of colour is important in some situations. Choosing and matching colours are important in weaving or sewing. Certain colours are used in decorations of objects or people.

A person's colour vision can be assessed by checking if differences in colour can be identified, similar colours matched and objects sorted by their colours. Collect different coloured threads, material or objects. Try to include red, green, yellow and blue. Spread the objects out in front of the person on a plain table or mat. The person can move as close as they want to the objects.

Discrimination of different colours – Make a group of at least 5 objects, 4 the same colour and one object that is a different colour. Ask the person to pick up the one which is a different colour.

Matching colours – Use many objects with at least 2 of each colour. Pick up different colours in turn and ask the person to find another one the same colour.

Sorting colours – Use many different coloured objects. Ask the person to sort all the coloured objects into piles with the same colours in each pile.

Record if they have trouble with any particular colours, all or none.

SUMMARY OF FUNCTIONAL ASSESSMENT PROCEDURE

These 19 activities are divided into 7 sections. They are suggestions to test functional vision.

Items	Ideas to Assess Skills
1. Awareness and attention to details	
a. Attention	• not needed if VA testing is done • use bright object, size of hand
b. Reach	• up to 1 metre • use small stones, paper balls • from big to small • centre, left, right...
2. Control of eye movements- tracking	
a. Maintain gaze	• small objects for rolling- to 4 metres • different contrast
b. Track an object	• distance 1 metre • use bright objects

	• up and down, side to side, diagonal and near to far
3. Control of eye movements- scanning	
a. Shift gaze	• distance 1 metre • 1 object in each hand • horizontal, vertical
b. Change fixation	• distance 3 metres • tester bright object • client small object • near, far, near
4. Discrimination of objects	
a. Find object	• distance 4-5 metres • familiar, different contrast objects, e.g. kettle
b. Follow path	• route over path with borders and winding
c. Avoid objects	• route with ground obstacles, puddles, branches
d. Identify near and distant objects	• near, 1 metre- coin, pencil, knife, spoon, stone • distance- activities, scene
5. Discrimination of details to identify actions and match objects	
a. Imitation of body gestures and actions	• distance 5 metres • gross movements
b. Facial expressions	• distance 2 metres
c. Match size	• use coins, or leaves or buttons
6. Discrimination of details in pictures	
a. Recognise actions	
b. Find objects in a complicated picture	
7. Identification and perception of patterns, numbers and words	
a. Match abstract figures	
b. Match numbers	
c. Match shapes with inner details	
d. Match words and pictures	

Adapted from "Assessment of Low Vision in Developing Countries" in the **Low Vision Kit**

Record the actual response, not what the person says they can do or you think they can do. Make notes on:

- The objects used for the assessment
- How easy or difficult the work was
- The person's comments
- Behaviour during the assessment

- Distance tested for each item
- The time taken to finish the activity, for example, 'quick', 'needed a long time', 'slow to respond' or 'scanning slow and random'
- If low vision devices were available and used

Here is an example of a form that can be completed to assess the visual capacity of a person:

PERSONAL DETAILS

Name: _____

Area/Village/School: _____

Age: _____

Eye problem: _____

_____

VISUAL ACUITY	Right	Left	Both
Distance presenting (without glasses)	_____	_____	_____
Distance corrected (with glasses)	_____	_____	_____

Near (both eyes) _____ at a distance of _____ cm

VISUAL FIELD

☐ All sides good ☐ Not possible to test

Limited

☐ Right ☐ Left ☐ Up ☐ Down ☐ Centre

Colour Vision

☐ Discriminate ☐ Match ☐ Sort

Comments

_____

_____

_____

_____

CONTRAST

☐ Needs good contrast (e.g. dark on light background)

☐ Can work with little light (e.g. light on light background)

Comments

_____

_____

_____

_____

LIGHT

Child/Client likes

☐ Dim Light ☐ Good Daylight ☐ Extra Light (eg Lamp)

Comments

_____

_____

_____

_____