

Case Study 2: 4 year old with Down syndrome

Report included:

I tested David's eyes today at the University of Ulster Optometry Clinic. As you know David is an engaging four-year-old boy with Down's syndrome. David's mother attended because she was interested in finding out more about David's vision before he starts school and was concerned about how his nystagmus was affecting his vision. David will attend mainstream school but will have a classroom assistant. He has had glasses in the past (not seen today, lost) but compliance has been limited. David was very co-operative today and my results are summarised below.

Summary of results

David is significantly hyperopic (long-sighted) and astigmatic. He has been given glasses in the past and I have encouraged his mother to persist with them as without them he struggles to focus accurately on near objects and the glasses will help him to see better. I have issued an up-dated prescription and the new glasses should be worn all the time.

David has nystagmus and this seems to improve slightly with spectacle wear and also when he tips his chin down and elevates his eyes. As this posture reduces the nystagmus it will allow David to make best use of his vision and should be encouraged. Spectacle frames that are as round as possible will help him to use this 'chin down' position whilst still looking through his spectacle lenses. He may benefit from a tilted desk at school so that he can avoid looking down when doing near work.

David's vision today was lower than I would expect from a child his age. This is likely to be due in part to his nystagmus but I would hope to see some improvement in David's level of vision when I review him after he has been wearing his glasses more consistently. Because of his nystagmus, even with appropriate spectacles in place, David will always have reduced vision and **I have enclosed images of appropriate size and detail for someone with David's level of vision.** A rule of thumb for David's level of vision is that objects and detail need to be approximately three times closer or three times larger for David to see them as well as someone with typical or '20:20' vision.

In addition to reduced high contrast vision discussed above, we know that children with Down syndrome often have reduced contrast sensitivity (reduced sensitivity to material at low contrast) and difficulties in cognitive visual processing (making sense of the visual environment and interpreting the important/relevant visual information).

I assessed David's contrast sensitivity today and found it to be below what is expected for a child his age. Poor contrast sensitivity can cause difficulties with recognising faces, identifying edges and contours and orientation in new environments. The contrast of educational material, play material and eating/drinking material should be

considered. For example David may benefit from using a really soft, dark pencil or a black marker when writing or drawing so that he can easily see the marks he is making. The contrast of text and pictures in story and picture book material should be considered with this in mind in addition to consideration of the issues discussed below. Increased task lighting ie a table lamp illuminating a puzzle or storybook can be helpful to improve visibility and aid both attention and enjoyment of a task.

David's parents completed a 'visual skills inventory' that elicits information about cognitive visual processing. The answers to this inventory suggest David does have some of the cognitive visual difficulties (in dorsal stream function) often encountered in Down syndrome. For David, these difficulties may affect how well he is able to navigate steps and surface changes difficult and make a 'crowded' visual scene difficult to interpret. For example, when trying to find a toy or item of clothing David may struggle if the item he is looking for is surrounded by others, or is on a patterned surface. Children with such difficulties often attend better when toys, food etc are placed on a plain surface and when distracting 'extra' items are removed. Plain duvet covers, carpets, plates and tablecloths may all help in reducing visual distraction and increasing the visual performance and attention span of a child with cognitive visual processing difficulties.

When David starts school he is likely to benefit from enlargement of reading and writing material as well as ensuring it is at high contrast and presented in as simple a format as possible. Too much information on a page is likely to reduce David's ability to access what is being presented. David may attend better to his teacher and black/whiteboard work if he is seated at the front of the classroom or his concentration may be focused better if he has an individual copy of what is being presented on the black/whiteboard on his own desk. The further away David is from the thing he is trying to see and concentrate on, the more additional visual information is also in his view increasing visual confusion and 'noise'. This can be overwhelming and reduce visual performance and concentration/cooperation.

All these issues should be considered when statementing for educational needs is conducted and when considering David's educational environment and the learning material presented.

To summarise, education and recreational material should be;

- appropriately enlarged to reflect David's visual difficulties,
- high contrast (avoid faint, light coloured pencils and pastels)
- uncrowded (plain uncluttered surfaces, not too much information presented at one time)

I will review David in six months time to monitor his compliance with spectacles and re-evaluate his vision with them.

Technical details:

Prescription issued: R +3.00/-1.50x170 L +3.50/-2.00x180

Visual Acuity (Cardiff acuity test @ 0.5 cm): binocular 6/19

Contrast sensitivity (Cardiff contrast test): 12.5 (8% contrast)

Accommodation (dynamic retinoscopy with Rx): significant lag without Rx, accurate with Rx

Ocular posture: Nystagmus (reduced slightly with spectacle Rx and on upgaze), no manifest strabismus detected.

Stereopsis (Frisby): Equivocal response to grossest target

Ophthalmoscopy: Media clear, fundii normal as seen.

Seen by: AN Other, _____ Senior Optometrist

Cc: Parents, General Practitioner, Paediatrician, Education services, School