So let me welcome again, return visit from the team from the New England eye low vision clinic at Perkins all the way to my left, I'm not sure what that orientation is for you, Dr. Barry Cran is the Director of the New England eye low vision clinic at Perkins and professor at the New England College of optometry and in 2004 appointed Chief "individuals with disabilities service at the New England eye institute. Next to him is Dr. Dee Louise Mayor, a vision scientist and internationally recognized expert in visual field testing of children in individuals with multiple impairments. Before joining the New England eye low vision clinic at Perkins, Dr. mayor was in practice at the Boston children's hospital. She's currently on faculty at the New England College of optometry and New England eye institute. And immediately beside me is Derek Wright, Coordinator of New England eye low vision clinic at Perkins, faculty at U-Mass Boston and assistant professor of vision rehabilitation at the New England College of optometry so thank you altogether presenting todays topic part II of our conversation about visual impairment and I will turn the floor over to Dr. Cran who will get us started.

Thank you, Robin. On behalf of Louise and Derek, we welcome you to todays webinar. We have a busy presentation today and we'll do our best to live time at the end for follow-up regarding any cases and any concerns you might have.

In the past webinar we've provided a categorization scheme for vision impairment including two types of brain related vision loss. In this seminar we will review this pod El based on this writing and provide four case examples of children with brain-based vision impairment. These include a case of vision impairment, a case ovicell lab vision impairment, a case of Dorsal stream CVI and ocular and ocular motor dysfunction and a case of visual impairment with deficit in Dorsal streams.

In reality please be aware the dorsal and ventral streams are not as discrete or as independent as portrayed but serve as an important conceptual model.

Little more volume, please, Dr. Cran, thank you.

This slide lists four main areas of vision loss. Ocular visual impairment includes the eye and the optic nerve and after which the bundle of neurons is termed the optic track. It's a major hub where Nueronal organization occurs and for example, neurons representing the left and right side of the visual world are sent to the right and left sides of the Occipital cortex. Ocular motor base as an impairment include ag of the areas of the brain involved in the generation of an impulse to move the eye including the brainstem, Thaliamus and Cerebellum. Cortical vision you'll impairment is rooted in adult Study of gun shot injury during wars in the early part of the last Century. For adults it's termed blindness and otherwise healthy functional ocular structures and ocular motor control. With pediatric brain damage and subsequent development, the low visual impairment may be restricted to the primary visual cortex but may also involve secondary vision areas as well as ocular and ocular motor structures. Cerebral visual impairment is pediatric bilateral brain damage impacting primarily the secondary visual processing areas. This includes the vision for [INAUDIBLE], the visual library of the ventral stream, acuity and/or acuity in crowded situations as well as visual field deficits are commonly associated with cerebral visual impairment .

Encephalopathy is a term for brain structure or function and causes include infectious agents such as bacteria or virus, metabolic dysfunction, brain tumor or increased pressure in the skull, prolonged exposure to toxic elements, chronic progressive trauma, poor nutrition or lack of oxygen or blood flow to the brain. So we're going to review here okay you par visual impairment, which includes the visual pathway of the eyes, retina, optic nerve.

Some of the thins that can cause the perception at least of a ocular vision impairment is significant uncorrected retractiove error and other things are retinal lesion, retinal de generation or dystrophy and optic nerve damage. I will now turn the presentation over to a colleague, Dr. Louise Mayor .

Thank you, Barry. My job today is to talk about two cases, the first one is cortical visual impairment andthat is as Barry outlined damage to the Occipital area. This is a boy who at Age 5.5 came to see us at the low vision clinic. He actually is a patient I've seen for many years. His history is significant for having a bacterial infection of the blood, as Neonate all. He had infantile spasms and the outcome is severe visual atrophy. This patient has been seen as a say for a number of years. His acuity has never been than about [INAUDIBLE]. When we tested visual acuity, we have to present things very carefully to him, not in the standard way but rather right in front of his face or off to the side, so we have to do an individualized presentation for this child as many other of our patients. This boy has severely visual impairment of his visual field as well. His field is quite constricted and it's suspected he only has a small area of the visual field in the lower right.

I'm going to show you a short video of Patient A holding a ball, this yellow ball, and putting it into a red bowl, that the examiner is holding in her hand and I want you to observe how he's holding his head and his eyes, what kinds of, how does he use his senses? How does he use his vision, his auditory sense and his [INAUDIBLE] test. I also want you to look and see what are the cues that are needed to help him to do the task which is to put the ball in the bowl, what kind of prompts does he need so let's start the video.

He's saying "got it" when he gets it. His mom is talking too. There he goes. Super. Can we do that one more time and just let me remind you to watch what he does. So it's presented way off to his left. He doesn't see it. He doesn't know where it is until the examiner taps the bowl. And now on the right unfortuntely he's tapping already, so he's going to queue on that sound but Derek thinks he may be using his vision. Let me just say now that it's over, he's practiced this a number of times with us and this is one of his favorite activities he does as well with other people so he learns very quickly where something is in space because the person that's putting it in there or they're giving him other cues such as tapping on it so he's usingauditory cues. We notice his head was tilted down and he keeps it tilted down almost all the time when you're showing him things. I think that's because he's using his auditory system more than any rig that he has.

So A is a boy that we consider having profound cortical vision impairment. He explores objects and he has very limited visual guided behavior, be does walk around but he said he has very much vision when he walks around, he doesn't discriminate objects by sight or people. He has to hear the person speak to know who it is and he has to touch objects to know what they are. He has some auditory and conflicts that we mentioned. We feel that this young man has been and is best treated like the approach that Dr. Christine Roman Lanesky uses for cortical vision impairment.

I want to review for you a slide that we showed last for Webinar I delineating the characteristics of cortical vision impairment as they are described in the literature. First let's remind you when there is damage, visual acuity is severely reduced, and visual field effects are quite profound, quite severe. Characteristics that we associate with cortical vision impairment and which we look for are the childs light gazing, staring at light or withdrawing from light, and see when he was, I'm sorry A when he was a baby did a lot of light gazing and now he does not do that. A has better visual attention for moving than static objects as shown as a way that I tested his acuity. He certainly pre fears Novel objects, he doesn't really recognize Novel objects but new objects, he does better in simple versus complex environment both visual and auditory. He has difficulty integrating his gaze with his reach whatever vision he has, and he has difficulty looking and listening at the same time. I want to just point out that the points that these behaviors that are highlighted in red really represent conflict visual behaviors and they overlap with behaviors that we consider to be part of the complex visual processing system of the dorsal [INAUDIBLE]. These are dorsal, I'm sorry, I need to use my arrow. These are dorsal pathway problems and this is a ventral pathway problem.

Next my job is to talk to you about our first cerebral visual impairment case and this is a child with ventral visual dysfunction but cerebral vision impairment is post the occipital lobe and the connection also including the motor cortex and the frontal lobe. So we consider cerebral visual impairment to be post occipital and the kinds of problems are complex visual processing problems. They are considered in two parallel pathways that interact, the dorsal and ventral pathway. I'm growing to show you briefly the two pathways that are quite separate. Here is V1, the occipital cortex, information came from the eye and then it goes to V1 for processing a very simple part of visual images. Further processing goes on and connects to the posterior Parietal complex which is a multi-sensory input area where all of the senses come together and are integrated and integrated with motor pathways, the frontal lobe contributes to attention and the scanning that is necessary to span the field so that's the dorsal. The vent all pathway is the lower part of the brain from V1 or the occipital lobe going to the temporal lobe. It is the pathway involved in recognition.

I'll show you this wonderful picture which looks at the dorsal ventral pathway in a different kind of way as a tree, with the trunk being all of the input areas of the brain and we're starting with the visual scene which gets subjected through the eyes into the pathway up to the occipital lobe and here is the area where we know that our Subject Ahads had very severe visual acuity, visual field loss due to damage to the occipital lobe and incidentally he has also of course cerebral damage to the other parts of the pathway, the dorsal and ventral. The dorsal stream is shown on the right part of the tree with coursing through the middle temporal lobe and up into the post ear your parietal lobe, this is the pathway responsible for the visual guidance of moving the arms and hands, legs and feet in the body and it's responsible for the person being able to see in complex and crowded environments. Dr. Dutton characterizes the dorsal pathway as the visual search, visual attention and visual guidance.

The other pathway, the ventral stream which I'll talk about briefly is the verb for objects, foreseeing objects shaped, seeing and recognizing objects. Recognizing words, letters and numbers, recognizing animals, recognizing people. There is certainly interaction between these pathways in a number of ways and one of them that's most interesting is really what's underlying root finding and being able to find your way in a crowd.

So the ventral stream receives visual input from the primary visual pathway from the occipital lobe. We think of this pathway as being the visual library for how we code images in the world, how we code objects and images of people.

My patient C is 10 years old when we're describing her now. She had non-accidental trauma at Age 3 and a half months. She has quite severe damage to her cortical areas and association visually. She has cerebral palsy, left worse than right. She can walk with great difficulty but she's not ambulatory, she travels in a wheelchair and also ocular problems and ocular motor as you see, retinal hemorrhage as a consequence of the trauma, eye turnout and she has ocular visual impairment as well as retina visual impairment. We do not think however that her ocular motor problems nearly caused her visual problems.

Her visual function show that visual acuity is about 2100 for grading acuity. That's not bad. Not as bad as A's visual acuity by any means. The interesting thing is though in the puzzle is she does not see shapes or letters unless they're two inches high and at three to four inches so she holds them very close to her face. Her visual field is very constricted, more on the left. Why does she have such difficulty identifying letters? She can do it eventually, she does identify a lot as she is able to map better than to name but what happens is that when a letter is changes its spot or there's some feature of the letter that's different she can't identify it. She really knows things by their very specific form that she learned them as and an example of that is the picture right here showing how difficult it is to recognize a transformed familiar object so this is big bird. I show her big bird, this little finger puppet and she knows it. She is name it, but then we show her this big bird who looks like a mailman or this big bird who looks like a cowboy and she hasn't a clue what she's seeing. She isn't able to really figure out what's going on with those figures. She uses color to identify communication icons. Black and white completely throws her. She can't identify letters or pictures in black and white. And she also does not recognize people by sight. This pattern of difficulty she has is actually characteristic of people who are called visual Adenopathy.

Her dorsal functions are pretty intact at least as far as we can test them. She looks and reaches as she does. She points to small objects and images, her spatial relations are good. I need to say about this child, C, she has pretty good language ability and if you give her the name of the object you want her to point to or the picture, you will be able to somehow identify visual images and objects, so this is quite characteristic of the behaviors of the ventral stream dysfunction and I'm ready to turn it over to Derek.

Thank you. Okay, so, in the case that I'm going to be presenting, then what you're going to see is really a combination of the case we've been talking about so this person is going to be a combination of ocular, cerebral and ocular motor. And again, just to kind of review a little bit, Louisa gave you aggrate example of someone with ventral stream dysfunction so when we talk about the dorsal stream keep in mind this is a higher level of vision. We really call the dorsal stream the "where is it" system. It's vision for action, visual attention and visually guided movement. So with this young man who was at the top we saw him was an older adolescent, Patient M. We can take a lack at some of his medical history here and he was born prematurely at about 28 weeks, right around two months there was a period where he was oxygen deprived, changes in the occipital cortex at that time and he had mild spastic Diplesia, which is his lower limbs are affected and you'll notice I've outlined things in blue. This is my attempt to show you as I look through medical history what are some points that lead me to think maybe there's possible cerebral involvement here so changes in the occipital cortex associated with the oxygen deprivation kind of make me think maybe there's some cerebral involvement here so I'm developing a hypothesis at this point.

As we look at his ocular history, and we see that he was actually diagnosed with a cerebral visual impairment at eight months, he has an Esatropia, which he has surgery for around the age of two. He has optic nerve, the color does not seem exactly right, and he also was prescribed glasses. So again I've used colors to pull out the different classifications or categories we're talking about here so in light blue, I look at the Esatropia, and all of that is leading me to believe ocular motor dysfunction or issues with the system.

In darker blue we have optic nerve Pallar, and the hyper optic and that makes me think of ocular all within the frontal portion of the visual system within the eyeball itself.

Looking a little bit further into what else did we find, from the ocular perspective we can see visual acuity so a distance with both eyes open, we see it with an isolated line at 20/70, use the whole chart and his distance visual acuity drops slightly 21/50, looking at near with both eyes open, at 40-centimeters he was able to identify or resolve the one M line, if it's isolated, if we gave him the whole chart he really had difficulty and wanted to pull it closer and his threshold jumped up to 5 Mso my take home message here is how is he managing complex information? So as long as things are simplified, he seems to be performing better than if we give him a lot of visual informational at once such as a whole chart and then his use of vision or the visual function drops. He also has an inferior field loss so you can see then from this diagram that he has a pretty absolute lower field loss right from midline down. Now laterally he has about 130 degrees visual field versus I think 180 is about right? You're the expert on that?

Yes.

Oh, good I got it right so that's reduced, so laterally he has slightly reduced visual field and also superior or vertically, we think of normal right around 65 or 70ish and it's slightly reduced for him there so certainly significant inferior visual field loss.

So just a moment I'll show you this video of this young man and what I want you to be looking for is does he scan the environment visually? Does he appear to integrate visual and additional sensory input? He's using a cane so I want you to watch what is he doing with that cane? When is he getting input from the cane or does he not? Does he demonstrate vision for action? Meaning does he have visual guidance of movement? So let's go ahead and start that video and I'll try and talk a little bit.

So this is also very very familiar route for him. So as he's starting off, his cane is in his left hand, cane tip on the ground and now it's raised. Here he's walking down a residential street, notice the position of the cane tip, notice as he's crossing his driveway entrance, he is not scanning to the left and to the right. Here he's coming up to an area of texture change and he's unsure how to handle this, he's modifying his gate, look at what he's doing with his cane, and now distinct scanning downward and we know he has that severe in peer your field loss so we would expect more of a head tilt downward. Here he is at the edge of the curb. There is a tactile warning there and again he does not scan to the left or to the right as he prepares to cross that street, and the up Curve, watch here, again difficulty judging the distance and overstepping that curb.

This is on the return. Here you're seeing at the curb. There's a curb cut, a car to his left whose waiting, his orientation mobility specialist is behind him and he is very hesitant. Remember this is a young man who has done this many many times . And you can see his O& M specialist is going to encourage him to move forward.

Keep describing, Derek. I'm getting a note that people aren't seeing it.

Okay, so he successfully navigated the intersection and made that street crossing with verbal prompting and help from his O& M specialist. So, it's going back to the next slide. We'll give them just a second as they bring me back to the next slide.

So looking at all of these behaviors in addition to some others we really think there's dorsal stream dysfunction here, so in that video you may have noticed he does have or we believe he has impaired vision. He had a hard time coordinating these two systems. At times he doesn't appear to know how to move his body, especially in those very complex sensory complex situations. He has impaired attention meaning he's not scanning. He has impaired visually guided movement. He has again a hard time in crowded or complex situations like those street crossings. All of these we think are consistent with dorsal stream dysfunction. Now the other key piece here is oftentimes we try and figure out well, what's ocular-based versus what's brain based? And as we look at what we know about his ocular diagnosis that the reduced acuity, his field loss, none of those really explain the behaviors that we're seeing in this very very familiar route so that's what leads us to believe this is more of a dorsal stream dysfunction in addition to ocular and ocular motor. And I think that's it for me.

Thank you, Derek. Our last case today is going to be Patient L who has an ocular and cerebral basis to her visual impairment and as we go through the case I think you'll be able to see what we feel is ultimately the predominant reason for her level of vision function and impairment.

L was a high school senior and came to see us and she had had ongoing and longstanding medical eye care as well as previous limited educational vision services. She was born prematurely and had bilateral hemorrhages and also a history of enlarged ventricles greater on the right side and there are many causes of the haven tic you lar with one being [INAUDIBLE] decreased like matter. L also had Hepotonia of the trunk. As clinicians working with patients with complicated medical and educational history, it is important to think about how their history might impact their function. Prematurity and more so early prematurity immediately raises the risk of an ocular cause of vision [INAUDIBLE], specificallyretinopathy of prematurity and further a strong association with prematurity and high Myopia.

Finally, there's also the increased risk of its dense. The remaining items raised the possibility of cerebral vision impairment as well as field loss. Though field loss can also be associated with [INAUDIBLE]. Hepotonia of the trunk and extremities is consistent with bilateral hemorrhages and in general it is fairly common in the patient population that we see for us to see this in association, see the impact of tone with CVI.

So as we went on with the case, we saw that ocular history was in fact positive for retinopathy prematurity worse in the right eye which needed to be treated surgically. There was very high my open yeah which means she was much more Myopic or near sighted in her right eye than her left and in fact structurally her eyes were elongated in the back in a particular area of the back of the eye that gave rise to a feature we call Staphyloma. She had them in each eye so she had several reasons or possibilities for her visual impairment being based on an ocular cause.

So we went on to she was articulate and engaged during the history and her plans included attending a community college. During the history the mother noted that the eye doctor believed she had the vision to do well in school and that she was simply lazy. Vision educators early on did not find that her acuity and function warranted ongoing vision services. Let's see what we found here with acuity. Both eyes viewing she was 20/60 full chart, 20/40 minus two using isolated letters. It took us 12-15 minutes to complete collecting acuity. This is an inordinate period of time for someone certainly whose college bound. Along with that, we had significant behaviors. She was clearly fatigued as this went on. Her head and body posture changed as the acuity went on, she sort of turned in her chair and twisted her body and had a head turn and tilt and her tone became more lethargic. Her color became pale and her voice became shallow. At this point of the exam it was clear that her behavior was not related to ROP or her other ocular issues, nor was it related to her laziness. No one with just an ocular cause of rig impairment would behave as L did during the acquisition of acuity. We now had visual function findings as well as functional and observational data to support the possibility of vision impairment secondary to pediatric brain damage so what other data might support this and what other data can we collect to support this previously overlooked diagnosis?

Here, we had had an older neuropsych evaluation to review and it revealed normal intelligence with some processing and speech and motor delays as well as some anxiety. A driving evaluation revealed cognitive, visual cognitive assessment in a moving vehicle which revealed she was unable to manage and figure out what to do in complex situations such as a car tire blowout. In a driving simulate or, she had great difficulty planning and successfully implementing the lanes and quoting from the report, she was not currently have the life skills necessary to cross a busy street, manage herself independently at home or in the community. This suggests that she would have a performance-based learning disability. Certainly that's true.

After collecting more traditional eye examination data, we had both mother and daughter independently completed survey. The version we used had 50 items which explored various areas of function. Each question had five possible responses: Not applicable, rarely, sometimes, often, or always. Mother and daughter checked off and were very consistent in their responses to numerous questions relative to dorsal stream dysfunction, so they had a lot of similar responses in the area that assessed visual field, visual attention when moving, impaired visually guided movement, impaired perception of movement, difficulty with complex visual scene, difficulty in crowded environments and difficulty or impaired visual attention.

Here was the surprising part. Mother and daughter disagreed on six or seven of the item which is explore the possibility of ventral stream dysfunction. L reported an inability to recognize a close relative in real-life and in photos as well as confused strangers for those familiar to her; however due to her intelligence and compensatory skills these issues alluded her very observant and caring mother.

Our conclusions were that her ocular visual impairment is not the primary pause of her visual function deficit. The educational team and eye doctor unfortuntely did not identify the signs consistent with cerebral visual impairment. MRI, our exam observations and the inventory supported the level, the diagnosis of cerebral visual impairment of both dorsal and ventral streams. Due to our observations, and data, our report lead to the implementation of vision services by both the teacher of the visually impaired and an orientation mobility specialist which then allowed for a successful transition to her community college and now eve to Derek for our [INAUDIBLE].

Okay, let's see if I can pull it all together here for us. So when we talk about pediatric brain damage we're really talking about a complex combination of abnormal subcategories or visual behaviors due to brain damage, and these subcategories can co-exist with other ocular and ocular motor categories so there's our message. We've given you these different classifications, these different areas and they can occur simultaneously with each other, so as much as we have presented in rather discrete areas, that's not always the reality and I hope, hopefully we've shown you a little bit of that in some of our cases here.

So where are we at right now? Well our approach to care and education is emerging. We're getting better and better and better but we still have a ways to go. We've still got to look at having accurate and early diagnosis and Management using a collaborative approach. So often, particularly if you get out of major metropolitan areas then we're working in isolation and that's a real barrier I think to providing good quality care for these children. Eye care providers need additional tools and training to identify cortical and cerebral visual impairments so again we've got to collaborate and educate each other and we as educators need to learn from the doctors and that's what's really great for me being able to work with these two guys, but we've got to start collaborating and talking. Conferences will be one way that we can do that. Individuals with cerebral visual impairment may not have access to vision related services and again this is a problem. It may be because there's no diagnosis. I'm sure those of you who have worked with children know that sometimes getting a visual acuity is difficult and for many states, it's that visual acuity that gives them access to services so there's a problem. Another problem we're having is that we have some children we are able to get a measured visual acuity on and it does not meet the eligibility criteria. Think about the children we've talked about here is they have if you just look at the numbers a relatively good visual acuity but functionally that's not where they're functioning at so there's another issue we've got to start looking at in terms of access to vision related services.

Another thing that we need to look at in the provision of services is whose taking the primary role. I think sometimes it kind of scares some of us who have been in the field for awhile we don't feel like we know a lot about it and that's for somebody else to take care of. Let the neurologist take the lead or let the OT or PT, it's really not a vision thing and I think sometimes that's true but it doesn't mean we as vision educators don't have something to contribute. We have a lot to bring to the table in our body of knowledge. There may be other times where we aren't the primary leader that we need to continue to work collaboratively but let somebody else take the lead, so again, just to kind of State this last sentence, CVI O & M have significant and necessary contributions to the development of an appropriate plan.

What about the future? Well again, we need to recognize we're talking about a very very diverse group of individuals. They have many different visual needs, many different visual issues secondary to brain damage and so we've got to recognize that. We also need to develop an agreed upon classification scheme. Now what we have presented to you today there are a lot of people that agree with that and we have pulled that from people that we've been learning from, but not everybody necessarily agrees with that either so we've got to work on that as professionals. We need to determine appropriate testing and instructional methods to meet the needs of the individual students, so what materials can we use both functionally as vision educators when we conduct a functional vision assessment but also as clinicians what can we is available in our tool box tappropriately assess these children and then again it goes back to education, education, education. We've got to expand the training for all of the vision educators and medical and related service professionals.

We've got some great resources for you. Many of these appeared on the Resource page at the last presentation, so we've got the proceedings on the cortical and cerebral visual impairment back in April 30 of 2005 and we've got Gordon Dutton and the editors of the clinics and developmental medicine visual impairment in children due to damage the brain, again a great resources, Hoyt visual function in brain damaged child, Anita Jacobs have a fantastic text called what and how does this child see. I believe that's available via the good light website. Dr.s Cran and Mayor, Chapter 14, boy this is a plug isn't it? Vision impairment and brain damage and the visual diagnosis and care of the patient with special needs and a brief overview, JVIB and then certainly Dr. Christine Roman Lansky's approach so these are just some of the resources that are out there so there's a lot more learning to do. And I think that's all for now.

One final slide.

Oh, here we go.

Did we answer your question?

Thank you all very much. Sorry I was responding to a question that was on screen. We do have some Q & A and I'm going to go ahead and ask them if I could ask the three of you to just respond to the camera. It will feel a little odd but I promise you my feelings won't be hurt.

One question that came in while we were in process, hold on, was here it is. 10 kids who are in late Phase III for CVI be considered to have a cerebral visual impairment instead of or in addition to CVI as we traditionally might think about as a cortical impairment? Any thoughts on that?

I can answer that. I can start out.

Okay, so speak to them.

I think it depends on what the behaviors the child is showing at Phase III. I think you mean by United States screen Roman LANski's and it depends on the behaviors and we would have to assess, for example, we wouldn't know is it a dorsal pathway problem or ventral or some combination so we really need to assess the child for those difficulties.

Right. I think we kind of showed is these can co-exist and so I think we're beginning to have the assessment tools such as Dr. Romans were but also Dr. Gordon Dutton, so the charge is be familiar with some of these hallmark behaviors that both of these surveys and rating scales identify and that we Vivek Arya long with the medical information.

And the Dutton survey, we didn't describe that very much but it is available, isn't it?

It's written in the Dutton, there's a chapter towards the final third of the textbook that describes that inventory and I think even has case example. The thing with that survey, one of the things that are somewhat time consuming and delicate is that you have a lot of information there from that survey. You then also need to consider the neuropsych evaluation and other testing that's been done in the school. The medical issues happening with that individual, the overall ability to move through space with a motor perspective as well as ocular motor and reasons for vision impairment to try and tweek out the possibility of cerebral visual impairment and that's a dawnting process and sometimes it's relatively easy to do and sometimes we can spend a few hours and disagree and sometimes we can spend a few hours and agree so it is not so simple to do the survey, add up the numbers and make a diagnosis.

In fact I think that the Dutton CVI survey leads to speck recommendations that in some ways were useful than diagnosis but looking at what those are.

Those workarounds which is in a paper by one of the co-workers.

Oh, yes.

It's also in the textbook.

Yes. The reference is in there.

Yes.

We do send out that set of recommendations when we think it's appropriate.

And who should make that diagnosis?

Well, I think an educator can look at those behaviors and certainly say it seems to be CVI, cortical or cerebral-like. I want to be very cautious of what the limits to my professional ability are, so I think that would be very accessible.

I think the children like I described A, cortical vision impairment, most eye doctors, pediatric eye doctors will see a child who shows those kind of behaviors and will say this is cortical vision so the diagnosis is made very early and you saw with Patient M that he had a diagnosis of cerebral vision impairment at eight months so there's concerns about a lot of kids although L was last. That diagnosis was not made for her, perhaps now there is more awareness in the community.

Right. But I think another thing that happens and we saw a case just not too long ago where they carried a diagnosis of delayed visual maturation, and that may be dead on, however I think that child is at risk for falling through the cracks so sometimes we as educators what we can do is not worry about making a diagnosis particularly if you aren't hooked into the system that you have access to of really qualified medical professionals so look at your behaviors and develop the plans based on your behaviors and then to continue to work for a diagnosis at some point. Now that's not the best scenario but I think it's one way to insure these children are not falling through the cracks.

We've had a couple of requests to watch the video again of Client M who was crossing the street. Several people weren't able to see it.

Can you make the comment about perhaps on iPads?

Yes, thank you. So while we've got several monitors here we're watching, it was showing us sharing on all of the monitors we're having including an iPad but if you are finding that it suddenly went blank I'd just ask you to Maximizer your screen wherever you can but we will show that again. It's only a couple of minutes and since several of you have asked for it. Can we do that now? Thank you.

Okay. Again here what you're looking for is scanning.

Okay, it's not on yet.

Well while we're pulling it up I'll prep it. Is I want you to look for scanning, integration of visual and additional sensory input and vision for action so all of those are hallmarks of dorsal stream functioning or dysfunctioning.

Okay, so here you see him again making a street crossing although it's really not an active street. He is using his cane. The cane tip is on the ground and now it's lifted. Now he is walking down the street and the cane tip is lifted off the ground and he's approaching a driveway entrance. He is not scanning to the left or right nor does he hesitate. The grading is downward. He's maintaining fairly good straight line of travel and now here he's become hesitant and he pulls his cane out vertically and he is hesitantly approaching an area that he's unsure about. He does re-extend the cane and it's on the ground but how much he's able to process that, watch as he's approaching this curb. There's a warning and he's certainly slowdown but I'm not sure how much he's getting from the cane. There he's using from his foot as he initiates the crossing. He is not scanning and now he's approaching the up curb. Again he oversteps that curb so his cane tip is variable. Now here he's on the return and again this is a familiar your route. He's at the curb and there's a car waiting to his left and he's really unsure what to do. He's not looking down and we would expect that he would. Now there's a slight downward, but not commensurate with his field loss. He does extend the cane here but again he becomes very hesitant. Now the O & M specialist is giving him a verbal prompt to move forward and he successfully crosses that street with assistance and missjudges the height of the up curb. So again, what I'd take from that is his behavior is not commensurate with what we know about his ocular diagnosis. It doesn't go along with the reduced visual acuity. It doesn't go along with the visual field loss. So there is something else going on with him with the intermittent use of his cane, again he's not getting as much tack tile input from that cane as we might want him to get but I'm not so sure he's able to tolerate that. I think that's why he's lifting that cane tip because again he's not managing multiple sensory information very well. Remember when we looked at the clinical data on him, remember his visual acuity he performed much better if he was given a single line rather than a whole chart so certainly from a visual perspective he's going to have a hard time managing complex and visual information and add to other sensory information and he's really struggling with that.

Thank you for helping us show that again. You know, one of the questions that came in earlier and I suppose this would serve for O & M as well is as a TBI or O & M, maybe someone working with one of these students and they see what they suspect seems to be an indication of a visual impairment what do we recommend they in their role, who is their best Resource to go to to try to take that maybe into a little deeper examination?

Of all mol O just?

Yeah, it has to be a collaborative approach when you're dealing with really complex students, you've got to get as much information as you possibly can and sometimes there's not a lot so we do feel like we're the ones charging out so it sometimes takes awhile, so be diligent in your gathering of behavioral information, gather that over a period of time because functioning may change based on your environment and day and all those things we know about so gather your data, try as best you can to pull in the expertise of others. Sometimes OTs and PTs are Nora available to us as vision educators than physicians are, so talk with them and try and figure out how much of this of their visual ability is related to motor function with the rest of their body such as other forms of CP for example,, look at what's happening with their eyes so it's I think it's a combination of all of those thins that help us.

And your role is really very important. Not a week goes by where we don't see a handful of patients a week that are in our clinic who have ongoing eye care but it's more a traditional medical oriented eye care or basic care and not this overarching view of the individual that we look to, that we look for in our patients and as a result then sometimes we can add to a diagnosis or make the diagnosis that's going to provide answers for the family and for yourselves so that the child can get the best care they can get and the best level of services that can then be advocated for and provided locally.

Barry, would you say then one of the roles is the TVI and O & M really need to contribute their report to the history, so if you received some behavioral or anecdotal information from a TVI or O & M that just enhances your ability then to come to some conclusions.

Right. So having a community-based functional vision assessment that may or may not is alerting media assessment with sensory channels can be really helpful for us to receive that A ahead of the appointment not at the appointment or afterwards so that we can review it and be able to then speak to that and in our report as well and we can change the environment during our evaluation to try and see if we can mimick some of the situations that are occurring that seem to be occurring in the community.

We have just a couple of minutes left. One of the participants asked if any of you are aware of some specific educational resources that are specific to classroom instruction for kids with CVI.

I think we've given you a good start with the Resource list so I'd say look through that first. You'll find links to other resources by reading those but those are the big resources by now.

Don't you think Amanda, she's a PhD in education--

And that is on that Resource slide which is the slide just before the one you're viewing now.

Probably within the next year, there will be Dr. Dutton is editing a textbook that will be sort of an educator friendly version of the Dutton fact book with even more on educational Resource as well, so diagnostic or educational resources are working with individuals with cerebral visual impairment.

We each of us have chapters in that book so we don't make any money from it.

Thank you. We recognize a potential conflict of interest.

Thank you

There is none.

A number of you Rxing about getting the slides as you did in Part I, so Part I slide deck was to be sent to the registrations and I noticed several of you said you hadn't received them so we will look into that and try to do the same with these slides. Our panel has given us the okay to do that so we'll follow-up on that but you can also find this presentation recorded. It's usually posted by the following day and for those of you who weren't seeing flash videos you should be able to see those on the recorded version as well.

But not on the handout. Not on the copy of the slides.

That's correct. They aren't magical but thank you very much.

[LAUGHTER]

I thought they were.

In your world.

Yes, in my world.

The technology center.

Yes, exactly.

[LAUGHTER]

Well, thank you, everyone, for joining us. We had over 70 people participating today and we encourage you to share the recorded version with your colleagues, Perkins E-learning webinars make great lunch and learns and round table discussions, it's a nice way to spend an hour together discussing things. We will have another session again next month. I am not at liberty to say its topic just now until we've confirmed that but if you are not receiving our e-mails if you got this forwarded from a friend or found it somewhere else please visit Perkins E-learning and sign up for our newsletter and I want to thank our presenters for sharing their knowledge. It's always appreciated and thank all of you for joining us today. We hope you found it informative in our thank you e-mail that will come shortly, you will get information on how to receive credits, continuing education points if you require them. Thanks very much and have a pleasant afternoon.

Thanks Robin.

Thank you.

Thank you.

 [Event Concluded]