

Neuro Exam Part 1

DRIP 3

January 11, 2022

Instructor: Logan Donaldson, DVM, Diplomate ACVIM
(Neurology)

© 2021 Drip Learning Technologies LLC.

All rights reserved. No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system, without permission in writing from the copyright owner. Printed in the United States of America

Be advised this document is here to enhance your learning experience and is a cumulative of the slides and transcript & area for your notes. You are welcome to take your notes electronically or print then use it to supplement your learning while watching the drip

Cranial Nerves – Cranial Nerve 2

- Optic Nerve
- Tests:
 - Vision



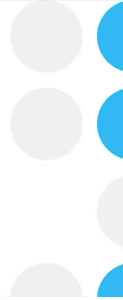
After that, I usually go into cranial nerve 2. So cranial nerve 2 is our optic nerve. And this test vision in the patient. And so there's a few different ways that we will test vision in our patients. One of them is just watching them around the room, make sure they're not bumping into anything, make sure that there's no reported issues at home of the patient having visual deficits or forgetting not being able to jump up on the couch anymore or bumping into things in the house, or if they've made a major change in terms of a move or move furniture around, sometimes that will be one of the first indicators that we have visual deficits because the patient is not seeing well anymore.

Assuming that the patient's ocular health is intact, then if we're going to test this nerve, we have a few different ways of doing so.

Cranial Nerves – Cranial Nerve 2



- Action:
 - Pupillary Light Reflex (PLR)
 - Shine a bright light into each eye
 - Menace Response
 - Move your hand towards the patient's eye stopping a distance from the patient
 - Visual Following
 - Drop a cotton ball
-



The first one I will do is usually the pupillary light reflex. For this reflex, what we want to do is shine a bright light into each one of the patient's eyes. This light needs to be bright enough in order to counteract any ambient light we have, but also needs to be strong enough that it's going to actually cause constriction of the pupil. When you see this, you should see directing consensual responses.

The next test we'll perform is the menace response. Now, remember, this is truly a response. You'll notice that the pupillary light reflex, it says reflex, and the menace response says response. It's not a hardwired reflex. There are aspects of it that are hardwired but it does involve a conscious response. And so remember that when evaluating the menace. The next test we'll perform is what we call the visual following test. This time, we'll either do again with a piece of food or a treat just to see if they'll follow me around, but I'll also draw up a cotton ball in front of them and see if they will follow the cotton ball.

Why do I drop a cotton ball? Well, because it's not going to make much sound.



Cranial Nerves – Cranial Nerve 2

- Response:
 - PLR
 - Direct and consensual responses should be intact
 - Menace Response
 - Blink in the evaluated eye
 - Withdraw the head
 - Withdrawal of the eyeball
 - Visual Following
 - Track the dropped cotton ball

And so when we're evaluating these responses, when we're looking at the PLR, we want to see a complete, direct, and consensual response. These should be very well intact. Your consensual or indirect response may be slightly delayed compared to the direct or slightly weaker than the direct, but they should still be intact and they should be symmetrical. If you're worried that the indirect or consensual might not be as strong as you would hope, evaluate the opposite eye. You should see equal indirect responses on those eyes if they are intact. If you're seeing that abnormality there, then you may want to sit back and say, gosh, maybe there is something going on there.

For the menace response, we should see a blink in the evaluated eye. The patient should also withdraw the head, and you should see withdrawal of the eyeball. This is a little bit tricky. Withdrawal of the eyeball is intact as long as the cranial nerves are intact, specifically cranial nerves 6. But because of that first aspect, they're the blink in the evaluated eye, if that facial nerve is intact and that patient is blinking appropriately, you very well may not see that withdrawal of the eyeball. Typically, you will see this when a patient has facial nerve paralysis and they can't blink the eye appropriately. That means they have decent nervous still intact, you should withdraw that eyeball back into the socket, and you should see elevation of that third eyelid in those cases. The response for tracking the cotton ball is just that. They should track the dropped cotton ball very well. At least with the majority of the time that we've dropped it, not every patient follows it immediately or they wait until it's in their field of view, direct field of view before they do follow, but they should follow it nonetheless.

Cranial Nerves – Cranial Nerve 2



- Complications:
 - PLR
 - Inadequate light source
 - Menace Response
 - Trigeminal Nerve
 - Young Age
 - Visual Following
 - Sound of the object

And so what complications may arise when we are performing these tests?

Well, the first one for the PLR we've already talked about, if you have an inadequate light source or if it's too bright in your current environment, it can be difficult to see much of a change in those pupils as we're shining a light into them. For the next one, the menace response, there are two big pitfalls we have here. One, if you create an air wave when the tests, you may falsely stimulate the trigeminal nerve, which is the sensory component to the face. And so when I perform this test as you'll see in the video coming up, I do my best to not create any type of an air wave. I tend to make more of a gesture than moving towards the patient.

There are some neurologists out there that will actually put a piece of plexiglass in front of the patient's eye so that way there's no way an air wave can form, get through the plexiglass and artificially stimulate the trigeminal nerve. The other thing we need to consider is the age of the patient. Up until about 12 to 16 weeks, depending on species, some patients simply will not have an intact menace response, and that deals with the development of the cerebellum in these patients.

Because this menace response goes through the cerebellum, it has to be fully intact before we can fully trust it and by age, it's 12 to 16 weeks. So just to consider this whenever we're doing a neuro exam on a young patient.

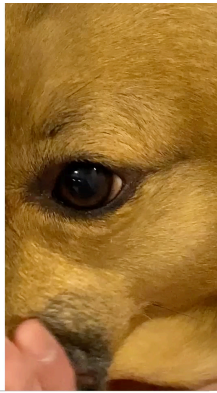
The other aspects with the menace response is that since it's a response and not a true reflex, it can be overridden. It can be overridden by medications, toxins, the mentation of the patient. And so if the patient has received sedatives, it may not be near as strong as we had hoped. If the patient is under the influence of a toxin such as marijuana or CBD, you may see it be hyper reactive.

And additionally, I have quite a few patients that come in, they are just bouncing off the walls, their adrenaline is super high, their high anxiety pets. And no matter what you do, they are just not going to blink. You can make all the gestures you want. They're just not going to blink because the second they do, they're worried. And so there is a behavioral component to it as well that we need to keep in mind.

The other complication for following an object. And this is one of the reasons why I will use a cotton ball, especially if I have a carpet or a rug under the pet is that the sound is negligible and non-existent. If you drop something that's heavier or can make a sound when it hits, you're not truly evaluating the patient's ability to track the object, they may be responding to the sound and once it actually hits the ground. Of course, you may have an indication that they're not being able to follow it appropriately because they don't look for it until it does hit the ground, but at that time, you then have to switch to a softer object. Anyways, so I always just use a cotton ball to start.

Cranial Nerves – Cranial Nerve 2

■ Pupillary Light Reflex



And so moving on to some of these videos. What you'll see is we have one video here of an eye, it's very difficult to get both eyes at the same time when evaluating this pupillary light reflex, but you should see the patient pupil constrict appropriately in these cases. And when we show this video, what you'll see is I cover the patient's eyes first to allow that pupil to dilate as much as possible. And then once we feel that we've had adequate adaptation to the new dark, we remove our hand, take a bright light, shine into the pupil. And as you see there, we should see appropriate constriction of that pupil.

Again, this relies on having a darker environment where you can cover your patient's eyes with your hand and typically, it requires an adequate light source in order to have it performed appropriately. One more time here. And as I remove my hand, I try to do this as fast as I can because ambient light is also going to affect this test. There you go. Appropriate pupil constriction. And we can feel comfortable moving on to the next step.

Cranial Nerves – Cranial Nerve 2

■ Menace Response



And that next step is the menace response. What you'll see on both of these tests is that you'll see I raise my hand to the side of the patient first. I simply bring the hand into their peripheral vision, I don't make any gestures, and I see if I can get a response out of them in that regard. After that, I will then make the menacing gesture. And as you'll notice, I don't move my hand towards the patient, I simply make a gesture that is almost not going to create any airwaves but is still going to be menacing in nature. So you can see just the gesture there.

And if I were to play this back, you can see as I bring my right hand up, you can see the patient blink suddenly right there, and the menace response there. And this is my own dog, I know she's a little worked up here. So you can see the blink response is at 100%. Going on in the opposite side, you can see the same thing here. Bring my hand up, see the blink, make that gesture. And then, we will see the blink again. That tells us that the business response is intact in these cases, and we can feel pretty comfortable at that point moving on to the next test.

Cranial Nerves – Cranial Nerve 2

- Visual Following
 - Cotton Ball



And this is where visual following will come in. As you see, I have the patient usually sit in front of me. If I need to have somebody hold on to them, I will. But then in my hand is a morsel of food that I know will have their attention. And then what I do is you'll see I just move the food left and then back to right, get their attention down and then up. If they can follow appropriately, we can feel comfortable knowing that they can see the piece of food and can follow it as we have it going.

This is the visual following with the cotton ball. What you'll see is that once the cotton ball enters the patient's field of vision, they track it all the way to the ground even before it hits the ground. If they don't track it till it hits the ground, we may want to re-evaluate that cranial nerve. Drop the cotton ball, boom. And they follow it appropriately. You can see that again. Same thing there. I always pick it up just because some dogs like to think it's a piece of food and go try to eat it, so I quickly grab it.