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Retinomax Autorefractor



What Are You Testing?

The Nikon Retinomax autorefractor measures refractive error (astigmatism, farsightedness, nearsightedness).

What You Need to Do the Test:

1. The Retinomax autorefractor.
2. Printer for the Retinomax.
3. Printer paper.
4. A model eye for calibrating the Retinomax.
5. Tape.
6. Antibacterial wipes.
7. An umbrella or curtain to help achieve low-level lighting.
8. A data sheet, ID labels, an electronic time stamp, and a pen.

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Getting Ready:

1. At the beginning of each day, the Retinomax must be calibrated. If the PC has not checked the calibration, measure the model eye. The procedure for calibration is included in the Retinomax carrying case. Always calibrate the unit in "Manual Mode." If the readings do not meet the tolerance limits specified in the calibration procedure, inform the PC. A back-up Retinomax will need to be used.
2. Make sure the measurement window is clean.
3. Select the child's ID label and place it on the data sheet.
4. Turn on the unit. Adjust the viewfinder until the internal monitor display becomes clear.
5. Place the Retinomax on the charger.
6. Attach the printer to the charger and turn on the printer and the charger.

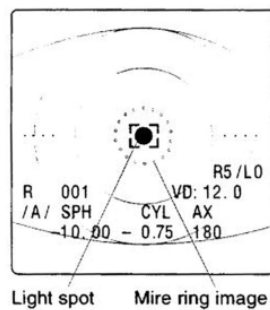
How You Do the Test:

1. If the child is wearing glasses, remove them prior to testing.
2. Stamp the start time with the electronic stamp in the appropriate box on the data sheet. Press firmly and let go when the stamp stops printing by itself.
3. Have the child sit/stand with his/her back against the wall/chair.
4. The tester should sit facing the child.
5. Press the blue "**Power**" button to turn on the Retinomax. Extend the forehead rest. Look at the lights on the switch panel.
6. Make sure that "**Auto Mode**" is lit up.
7. Make sure that "**Quick**" is **not** lit up.
8. Look in the viewfinder. The display should show "**RO/LO**" in the upper right-hand corner. This shows that the Retinomax has taken 0 measurements for the right and left eye. If you don't see this, turn the Retinomax off and on again. Adjust the viewfinder again until the image in the window is clear.
9. Hold the Retinomax in front of the child's right eye. Tell the child to look in the center of the round hole in the front of the Retinomax and see if he/she can find the "white lights of an airplane in the sky...." It may help to put your thumb on the

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child's forehead. Hold the child's head in place with your other fingers. The working distance is about 40 mm.

10. Position the Retinomax in front of the child's eye using the vertical eye position target line and the horizontal eye position target line. Alignment is easier by looking through the viewfinder after lowering the forehead rest to where it comes in contact with the child.
11. Press the green "**Start**" button on the handle once to begin taking measurements. Look through the viewfinder. You will see a set of brackets ([]). Center the brackets over the child's pupil. See that the center dot is focused.
12. Move the unit toward and away from the child until each dot image of the mire ring can be seen clearly. Adjust the distance so that the mire ring is as small and sharp as you can make it. Keep the headrest in contact with the child's forehead or with your thumb on the child's forehead.



13. When the alignment process is complete, the measurement is automatically started. Every time a measurement is made, a beep sounds.
14. Encourage the child to keep looking at the Retinomax. Ask him/her if they can see the white lights. It may help to keep talking about the lights. (For example, "What shape are the lights? What else could those lights be?")
15. Once the display on the Retinomax indicates that it has taken 8 measurements of the right eye (**R8/L0**), remove the instrument from the child's forehead and align the instrument with the left eye. Listen for the beep and/or look at the lights on top of the instrument to be sure the instrument has switched to the left eye. Perform the measurements of the left eye. When the display on the Retinomax indicates that it has taken 8 measurements of the left eye (**R8/L8**), remove the unit from the child's forehead. Aim it at the printer and press the "**Print**" button to print the child's results.

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16. If the readings taken do not have a confidence value of **8** or greater, you must take the readings again. Dimming the lights may help in obtaining a reliable measurement. Only eyes with a confidence value of 7 or less should be measured again. Up to two repeat sets of readings may be performed.

Note: A reading means that a measurement was taken. Readings may have either acceptable or unacceptable confidence values.

17. **DO NOT TEAR THE PRINTOUT OFF OF THE PRINTER UNTIL TESTING IS COMPLETED.**

18. Print after the first test and after each retest but do not tear off the printer tape until all measurements have been taken and printed. Advance the paper in the printer by pressing the feed button to provide a margin for taping. Tear off the printer tape.

19. Tape the printout to the child's data sheet. For each eye, **circle the first reading** with a confidence value of **8** or greater. Circle the entire line, including both the measurement and the confidence value. Be careful not to write on either the measurement or the confidence value.

20. If you obtain a reading but the printer does not print a measurement for an eye, do **not** mark "None (unable)" on the data sheet. Report the number of readings that were obtained for the eye. If the refractive error and confidence value are available from the machine's display, write them in the box on the printout on the data sheet. Label the values for each eye "Right" or "Left." If the values are not available from the machine's display, write "No Printout."

21. You can make 3 **consecutive** "attempts" per eye to get a reading and fail (such as timing out). If you don't get a reading for an eye after 3 **consecutive** attempts, mark "None (unable)."

Note: An "attempt" means that an effort was made to take a reading but the instrument timed out. There is no data available to print.

22. If you obtain one or more readings but need to take another reading (because the confidence value is too low) you can make 3 more **consecutive** attempts to get another reading. If you are unable to get another reading after 3 consecutive attempts, testing stops. Mark the number of **readings** (not attempts) that you obtained and attach the printout for the readings that were obtained.

23. If this is the last test you are taking on the child, stamp the end time with the electronic stamp in the appropriate box on the data sheet. Press firmly and let go when the stamp stops printing by itself.

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24. Turn off the Retinomax to clear the measurements for the next child. Rest the Retinomax in the charger in between testing children.
25. Cleanse the headrest with an antibacterial wipe.

What You Tell the Child:

1. Tell the child to stand very still.
2. Tell the child that he/she will see white lights.
3. Tell the child to keep his/her eye open as long as possible.

What You Write Down:

1. Stamp the start time with the electronic stamp in the appropriate box on the data sheet when you start the Retinomax measurement.

Start Time Stamp

2. The unit automatically records and prints the measurements for you. Tape the printout to the data sheet **before** the child leaves the station. Make sure you don't cover any of the readings with the tape or write on any of the readings.
3. Mark the number of readings taken per eye in item **#R2 a** and **#R2 b**. If the child does not allow the machine to be positioned properly for measuring an eye, or if the machine does not provide a reading for an eye, mark "None (Unable)" on the data sheet for that eye.

R2 Number of readings per eye

a. <u>Right Eye</u>	b. <u>Left Eye</u>
None (unable) ()	None (unable) ()
One ()	One ()
Two ()	Two ()
Three ()	Three ()

4. If you obtain a reading but the printer does not print a measurement for an eye, do **not** mark "None (unable)" on the data sheet. Report the number of readings that were obtained for the eye. If the refractive error and confidence value are available from the machine's display, write them in the box on the printout on the data sheet.

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Label the values for each eye "Right" or "Left." If the values are not available from the machine's display, write "No Printout."

5. If you obtain one or more readings but need to take another reading (because the confidence value is too low) and then fail 3 times in your attempt to get a reading (because the instrument times out), mark the number of readings that you obtained and attach the printout for the readings that were obtained.

Remember!

1. Make sure you put the ID label on the form.
2. Make sure you stamp the start time on the form.
3. Remember that the unit must be calibrated before taking measurements.
4. Do not tear off printout until all readings are complete.
5. Advance the paper in the printer by pressing the feed button.
6. Make sure the printer has enough paper to record the results.
7. Remember to tape the printouts to the form right after you take the reading. Make sure you don't cover any of the readings with the tape or write on any of the readings.
8. For each eye, **circle** the first measurement with a confidence value of **8 or greater**.
9. You may make **3 consecutive** attempts per eye to get a reading.
10. Do not take more than **3 readings** per eye.
11. Remember to stamp the end time on the data sheet if this is the last test you are doing with a child.