

SOP

HOW TO USE PERIMETRY MACHINE

**Department of Physiology
Faculty of Medicine, UWUSL**

STANDARD OPERATING PROCEDURE (SOP)

Operation of the Henson 9000 Visual Field Analyzer and Henson Perimeter Software

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1. Purpose

This Standard Operating Procedure (SOP) describes the standardized method for operating the **Henson 9000 Visual Field Analyzer** and **Henson Perimeter Software** during undergraduate physiology practical demonstrations conducted in the Physiology Skills Laboratory. The SOP aims to ensure safe, consistent, and reliable visual field assessment while promoting good laboratory practice.

2. Scope

This SOP applies to:

- Demonstrators conducting physiology practical sessions.
- Students performing visual field assessments under supervision.
- Technical staff responsible for routine maintenance of the instrument.

3. Responsibilities

Demonstrator

- Prepare the instrument before each practical session.
- Explain the examination procedure to students.
- Supervise all testing.
- Ensure proper cleaning and shutdown after use.
- Report equipment faults.

Students

- Follow instructions carefully.
- Handle the equipment responsibly.
- Report any problems immediately.

Technical Officer

- Perform preventive maintenance.
- Arrange servicing and repairs.
- Maintain maintenance records.

4. Principle of Automated Perimetry

The Henson 9000 performs **automated static perimetry**, a non-invasive technique used to evaluate the sensitivity of different areas of the visual field.

During the examination, light stimuli of varying intensities are projected at predetermined retinal locations while the patient maintains fixation on a central target. Whenever a stimulus is perceived, the patient presses a handheld response button. The software determines the retinal sensitivity at each location and generates a visual field map.

Visual field testing assists in detecting functional defects associated with glaucoma, neurological disorders, and retinal diseases.

5. Equipment and Materials

- Henson 9000 Visual Field Analyzer



- Computer with Henson Perimeter Software

Smart Supra	ZATA Threshold		Binocular
 Smart Supra Multiple Stimulus Central	 ZATA Standard Threshold 3D / 24-2	 ZATA Standard Threshold 10-48	 Esterman Binocular Driving Test Group 1
 Smart Supra Single Stimulus Central	 ZATA Fast Threshold 3D / 24-2	 ZATA Fast Threshold 10-48	 Esterman Binocular Driving Test Group 2

- Patient response button



- Trial lenses (when required)
- Occluder



- Printer
- Lens cleaning tissue



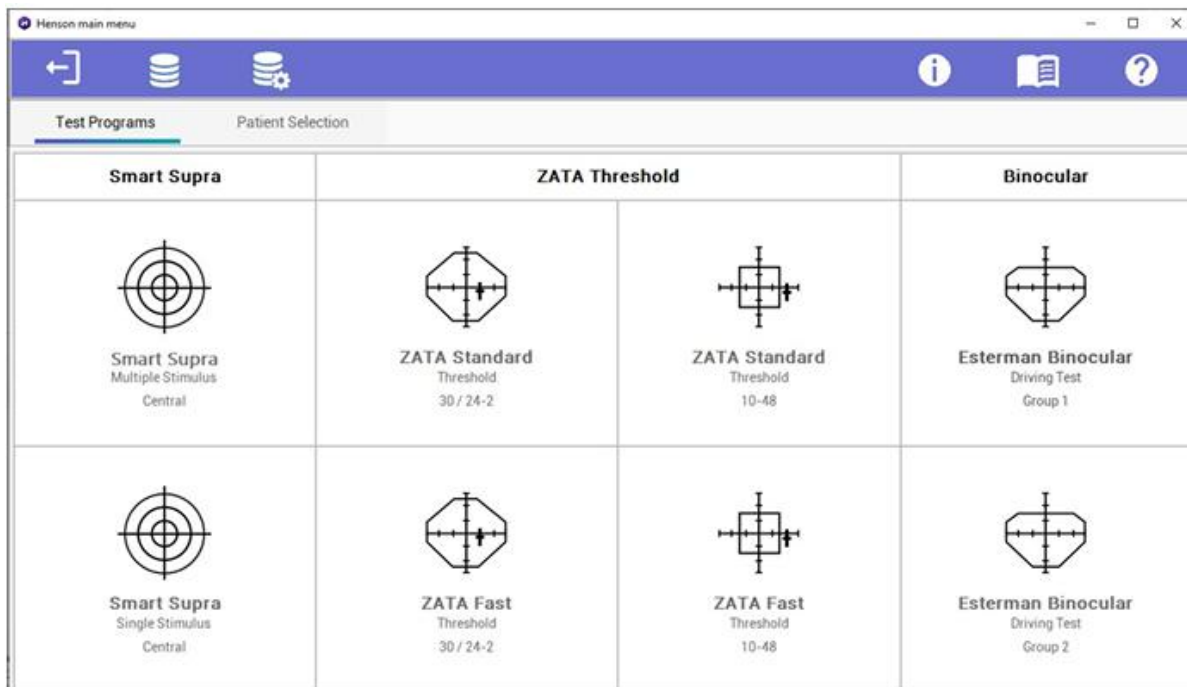
- Soft lint-free cloth



- Approved disinfectant

6. Henson Perimeter Software

The **Henson Perimeter Software** provides the primary interface for operating the Henson 9000. The software controls the perimeter, manages patient records, supervises examinations, analyses results, and stores examination data.



The software allows the operator to:

- Create new patient records.
- Retrieve previous examinations.
- Select examination protocols.
- Monitor patient fixation during testing.
- Display examination progress.
- View reliability indices.
- Save examination data.
- Print or export examination reports.
- Compare current examinations with previous results.

7. Safety Precautions

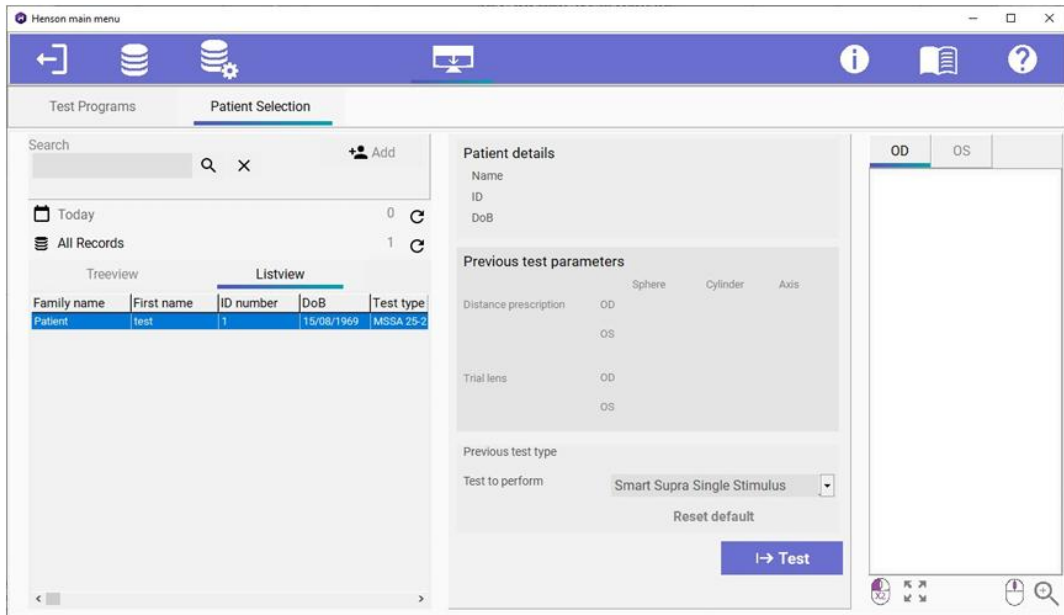
- Operate the instrument only after appropriate training.
- Ensure the instrument is connected to a properly grounded electrical outlet.
- Inspect cables before use.
- Do not operate damaged equipment.
- Keep liquids away from the instrument.
- Clean all patient-contact surfaces between patients.
- Do not dismantle the instrument.
- Report equipment malfunctions immediately.
- Ensure patient comfort throughout the examination.

8. Patient Preparation

1. Verify the patient's identity.
2. Explain the purpose of the examination.
3. Explain the use of the response button.
4. Remove spectacles if appropriate.
5. Insert the appropriate trial lens when necessary.
6. Occlude the non-tested eye.
7. Seat the patient comfortably.
8. Instruct the patient to maintain fixation on the central target.
9. Encourage the patient to blink normally during the examination.

9. Machine and Software Preparation

1. Inspect the perimeter, cables, and accessories.
2. Switch on the computer.
3. Switch on the Henson 9000 perimeter.
4. Launch the **Henson Perimeter Software**.
5. Verify communication between the software and the perimeter.
6. Log in using the appropriate user account (if applicable).
7. Open an existing patient record or create a new patient profile.



8. Confirm patient demographic information.
9. Select the required examination protocol.
10. Confirm printer availability before commencing testing.

10. Standard Test Settings

For undergraduate physiology practical demonstrations, the **Smart Supra Single Stimulus** test is recommended as the default examination protocol because it provides a rapid, fully automated assessment of the central visual field while allowing students to understand the basic principles of automated perimetry.

Recommended settings:

- **Test protocol:** Smart Supra Single Stimulus
- **Test pattern:** 30-point screening (default)
- **Threshold determination:** Age-related (Total Deviation)
- **Stimulus size:** Manufacturer default (Goldmann Size III)
- **Fixation monitoring:** Enabled
- **Reliability monitoring:** Enabled

If abnormalities are detected during the screening examination, the test may be extended to the 64-point or 86-point Smart Supra examination, or a threshold examination using the **ZATA** algorithm may be performed for a more detailed assessment.

The **ZATA Threshold** test may be selected when a quantitative measurement of retinal sensitivity is required. When previous visual field data are available, ZATA uses these values as starting estimates to shorten examination time. If no previous examination exists, the software automatically uses age-related normal threshold values.

11. Patient Positioning

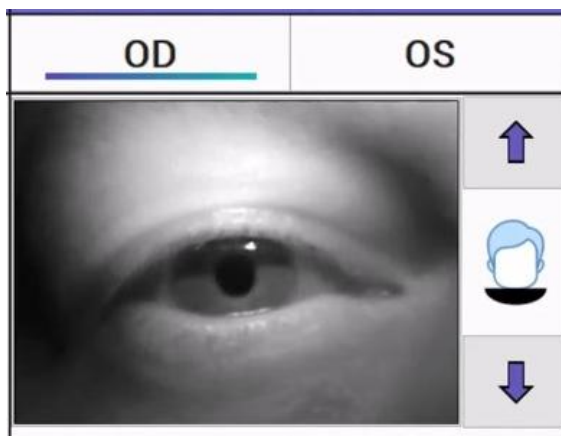
1. Adjust the chair height.



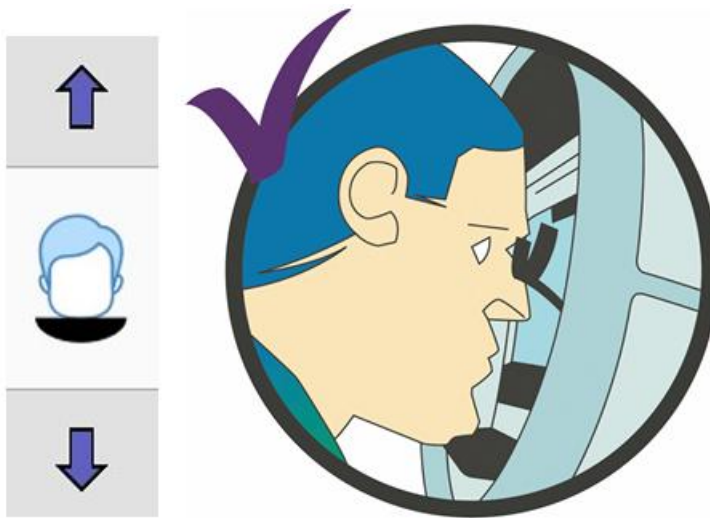
2. Position the patient's chin comfortably on the chin rest.
3. Place the forehead firmly against the forehead support.



4. Align the eye centrally using the fixation camera.



5. Adjust the chin rest until proper alignment is achieved.



6. Confirm that the patient is comfortable before starting.

12. Test Procedure

Software Configuration

Before starting the examination:









- Verify the correct patient record.
- Confirm patient demographic information.
- Select the eye to be examined.



OD – Right eye

OS – Left eye

- Select the appropriate examination protocol. For routine undergraduate demonstrations, select **Smart Supra Single Stimulus**.

Test Programs		Patient Selection	
Smart Supra	ZATA Threshold		Binocular
 Smart Supra Multiple Stimulus Central	 ZATA Standard Threshold 30 / 24-2	 ZATA Standard Threshold 10-48	 Esterman Binocular Driving Test Group 1
 Smart Supra Single Stimulus Central	 ZATA Fast Threshold 30 / 24-2	 ZATA Fast Threshold 10-48	 Esterman Binocular Driving Test Group 2

If a more detailed threshold analysis is required or if follow-up assessment is being demonstrated, select the **ZATA Threshold** protocol.

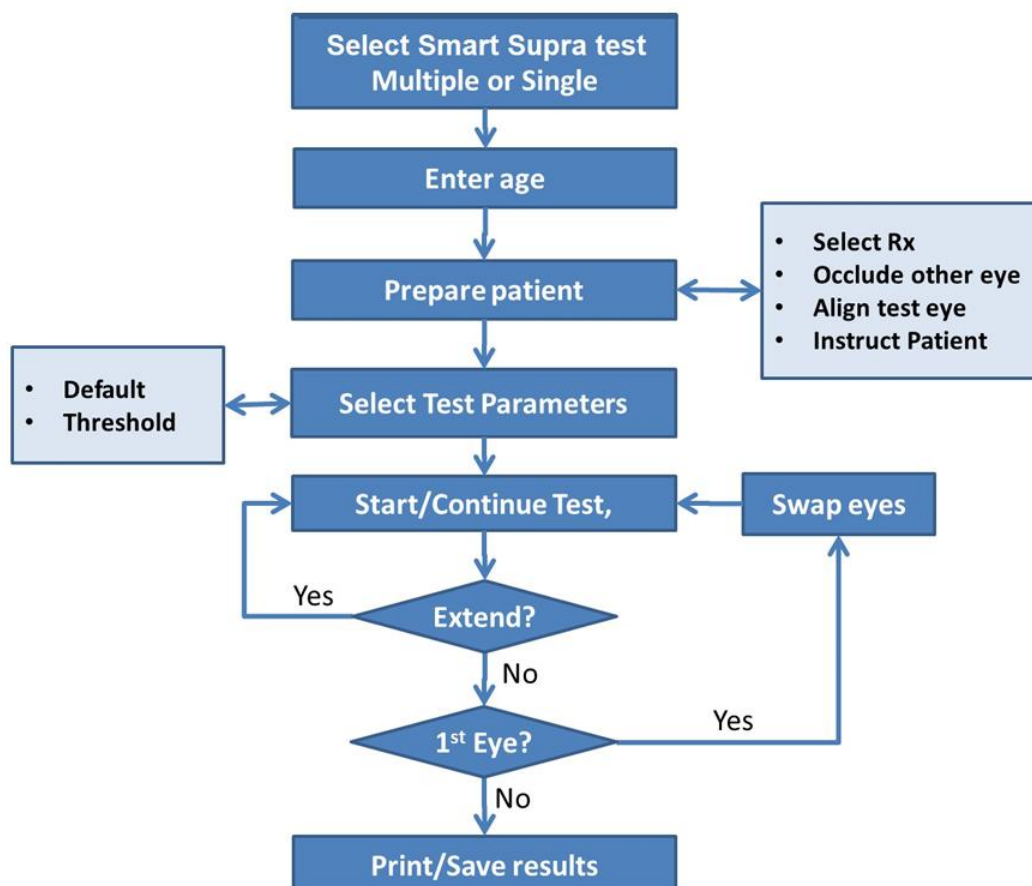
- Confirm trial lens information (if applicable).
- Verify fixation monitoring is enabled.
- Review examination parameters.

Examination

1. Explain that the patient should press the response button whenever a light stimulus is seen.
2. Ask the patient to maintain fixation throughout the examination.

The Henson 9000 has two fixation targets:

- Central: A small red spot in the centre of the field.
 - Four-point: A four-spot diamond target where the spots are located 6 degrees from the central point along the 0, 90, 180 and 270 meridians. The four-point target is provided for patients who have lost central vision. The patient should be instructed to look at the centre of the four-point pattern
3. Start the examination.
 4. Monitor patient fixation and examination progress.
 5. Pause the examination if repositioning becomes necessary.
 6. Resume testing once alignment has been restored.
 7. Complete the examination.



13. Reliability Assessment

Following completion of the examination, review:

- Fixation losses
- False-positive responses
- False-negative responses
- Patient cooperation
- Test duration

If reliability indices indicate poor-quality results, repeat the examination after reinstructing the patient.

14. Saving and Printing Results

1. Review the examination for completeness.
2. Verify reliability indices.
3. Save the examination to the patient database.
4. Review the visual field report.
5. Print the report when required.
6. Export the report electronically if necessary.
7. Close the patient record before exiting the software.

The software automatically stores patient examinations for future comparison.

15. Data Management

Patient information should be managed in accordance with institutional policies regarding confidentiality and data protection.

Operators should:

- Verify patient identity before saving records.
- Ensure data are stored under the correct patient profile.
- Perform routine database backups according to departmental policy.
- Restrict software access to authorized personnel.

16. Cleaning and Disinfection

After **each patient**:

- Clean the chin rest.
- Clean the forehead rest.
- Clean the response button.
- Clean trial lenses when used.
- Wipe external surfaces with an approved disinfectant.

Do not spray disinfectant directly onto the instrument.

Allow all surfaces to dry completely before the next examination.

17. Preventive Maintenance

Daily

- Inspect cables.
- Check instrument cleanliness.
- Verify software operation.

Weekly

- Inspect accessories.
- Check printer operation.

Monthly

- Inspect connectors.
- Review maintenance records.

Annual servicing should be performed by qualified service personnel according to the manufacturer's recommendations.

18. Troubleshooting

Problem	Possible Cause	Corrective Action
Instrument not detected	Loose connection	Check USB and power cables
Poor fixation	Patient movement	Reposition patient and repeat
No response detected	Response button disconnected	Reconnect response button
Printer not functioning	Paper or connection problem	Reload paper and check connections
Excessive false-positive responses	Patient misunderstanding	Reinstruct the patient

19. Documentation

Record:

- Patient identification
- Date of examination
- Operator
- Eye tested
- Examination protocol
- Reliability indices
- Comments
- Technical issues encountered

20. References

1. Henson 9000 Visual Field Analyzer User Manual.

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