Quick Reference Guide

Pattern Titration[1]

Overview

The <TITRATE> process on the PASCAL laser system allows the user to determine a laser energy dose, specified at a particular pulse duration. This feature allows for a treatment baseline to be established based on the desired tissue response for the intended treatment and therefore should always be done prior to beginning actual treatment. Initial titration setting levels should be low, progressively moving up to achieve the desired response. Titration burns should only be delivered outside the visual field to the outer retina. It is recommended that the physician wait at least 3 seconds before evaluating the titration lesions as this is the time it take to achieve the maximum response.

The PASCAL Synthesis System (software version 3.3.1 and greater) allows the user to choose multiple spots (in addition to a single spot) when performing titration. The feature delivers a series of spots with decreasing power levels with a single footswitch press. Subsequent assessment of tissue reactions allows the user to compare and select the desired power level for the treatment session. The operator can then more efficiently determine their titration endpoint and begin the treatment process. Additionally, if the operator uses the 3D controller and the slit lamp to control position of the titration pattern and selection of the power level, the entire titration process can be completed while looking through the microscope.

1. Treatment Screen	2. Select <Titrate> Function	3. Select Titrate Pattern Option
Ensure system is powered ON and navigate to the Treatment Screen.  *Note: While using the <Titrate> feature, the user can change Pattern, Power, Exposure, Spot Diameter and Aiming Beam settings. Endpoint Management, Rotation, Fixation Light, Outline Lights and Auto-Auto Advance cannot be used.	Before beginning treatment, the baseline energy level should be determined using the titrate feature. On the Treatment Screen, select the <Titrate> button. When <Titrate> mode is enabled, the pattern is centered in the current field of view of the selected pattern with the single spot default pattern. 	When <Titrate> mode is enabled, the following titration pattern options can be selected: 1x1 (default), 1x2, 1x3, and 1x4. Horizontal spacing between spots can be adjusted from 1.0 to 2.0 of the selected spot diameter. 

[1] For further details regarding PASCAL System Setup, consult your Technical User's Manual.

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4. Adjust High Power Level

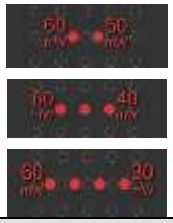
If more than one spot is selected for titration (ie. “Pattern Titration”), the left-most spot will be delivered with the current power selected by the user (60mw in the example below). This will be the high power delivered for the titration series.

5. Understand the Power Decrement

If more than one spot is selected for titration, the adjacent n spot from the left-most spot will be delivered with the power decremented by n steps from the current power selected by the user.

Note: the decrement step of each adjacent spot can vary depending on the range of power that the pattern spans.

4-spot titration decrement examples:
175mW→150mW→140mW→130mW
60mW→50mW→40mW→30mW



6. Deliver Titration Spot(s)

a. Ensure that the laser it targeting the outer part of the retina, outside of the patient’s visual field.

b. Begin by pressing the activation footswitch to initiate the delivery of the titration spots from the highest power level (far left) to the lowest power level (far right).

c. Upon delivery of all selected titration spots, the system automatically stops energy delivery and the aiming beam remains OFF as long as the footswitch remains activated.

d. To end the titration cycle, release the activation footswitch. The system will go back to power selection mode and the aiming beam will turn back to ON.

7. Spot Selection Mode

a. After releasing the footswitch, completing the titration pattern delivery, the currently selected spot (default is the highest power level spot) will appear solid (through the slitlamp) and all other spots will flash on/off.

b. If the user selects any of the other spots (by selecting it on the touchscreen), the selected spot will appear solid, while all others will flash on/off.

8. Selecting Treatment Baseline

a. When the user exits from <Titrate> spot selection mode, the power level automatically adjusts to match that of the selected spot.
b. All other pattern and setting parameters can also be adjusted to begin treatment.

9. Using Progressive Titrate

Note: To use the Progressive Titrate feature, it must be enabled in the system settings.

The Progressive Titrate feature allows the user to deliver sequential titration patterns shifting the pattern upward by 1.5 spot size diameters for each successive delivery until the field of view limits are reach.

a. Deliver the multiple spot titration pattern by activating the footswitch. Keep the footswitch activated and assess the tissue reaction with the aiming beam turned OFF.
b. When the footswitch is released, the aiming beam will shift upward by 1.5 spot size diameters and progressive shifts up each time the user decides to redo the titration.

10. Using Progressive Titrate with Octant Patterns

11. Example: Progressive Titrate with Octant Patterns

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When using the Progressive Titrate feature with Octant Patterns (Standard or Enhanced), the system can determine an inner radius exclusion zone and automatically move the initial titration point(s) outside of this region.

Each successive titration delivery will then be shifted upward by 1.5 spot size diameters.

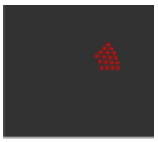
The user must properly locate and establish the center of the fovea using the <Fixate> feature. The inner radius (exclusion area) must also be set prior to the titration.

An example of recommended use is provided in Step 11.

a. Select the <10ms> grouping at the bottom of the screen. 

b. Select the <Boundary Outline> feature. 

c. Press the Status button to change to Ready mode. View all spots of the first default segment (2'oclock segment) and concentric circle outline via the oculars.

d. Activate the <Titrate> mode. 

e. Verify the location of the single titration spot (approximately in the radial center of the first treatment segment) and change the location, if necessary.

f. Change to multiple spot titration pattern (optional) and select the maximum titration power level.

g. Verify the location of the titration pattern via the ocular and activate the footswitch to deliver the titration pattern.

h. Keep the footswitch activated after delivery of the titration spots to assess the tissue reaction with the aiming beam turned OFF.

i. Release the footswitch to return to the pattern titrate power selection mode – the aiming beam will shift 1.5 spot size diameters upward and will progressively shift upward each time the titration delivery is activated without any changes in setting and parameters.

j. Exit the titration mode and the power level corresponding to the blinking spot will be set as the treatment power level.

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