Instructions for Use

English

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NeuroQuant V3.0.2 for IntelliSpace Portal

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1 About this Instructions for Use

This instructions for use provides information on the capabilities and basic workflow of Cortechs Labs NeuroQuant® V3.0.2 application integrated into IntelliSpace Portal.

Note: This instructions for use also applies to NeuroQuant® V3.0 and V3.0.1 .

The CorTechs Labs NeuroQuant user manual can be accessed via the NeuroQuant Help, located below the toolbar in the application side panel.

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2 Intended Use

NeuroQuant is intended for automatic labeling, visualization and volumetric quantification of segmentable brain structures and lesions from a set of MR images. Volumetric measurements may be compared to reference percentile data.

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3 About NeuroQuant

NeuroQuant is a third-party software application manufactured by Cortechs Labs, San Diego.

NeuroQuant functionality within IntelliSpace Portal

- Segmentation on 3D T1 W MRI series.
- Comparison of the volume of different brain structures in the series to a normative database for the same demographic group.
- Creation of a PDF report of volumetric information of the brain's structures. You can view the report in the dedicated NeuroQuant Viewer. The report displays volumetric results alongside color-coded secondary captures in axial, sagittal, and coronal orientations.
- Reports can be created manually for a specific series, or they can be triggered to run automatically after completion of a study.
- NeuroQuant offers a range of report types for different disease conditions, including combination reports that provide information on multiple conditions.

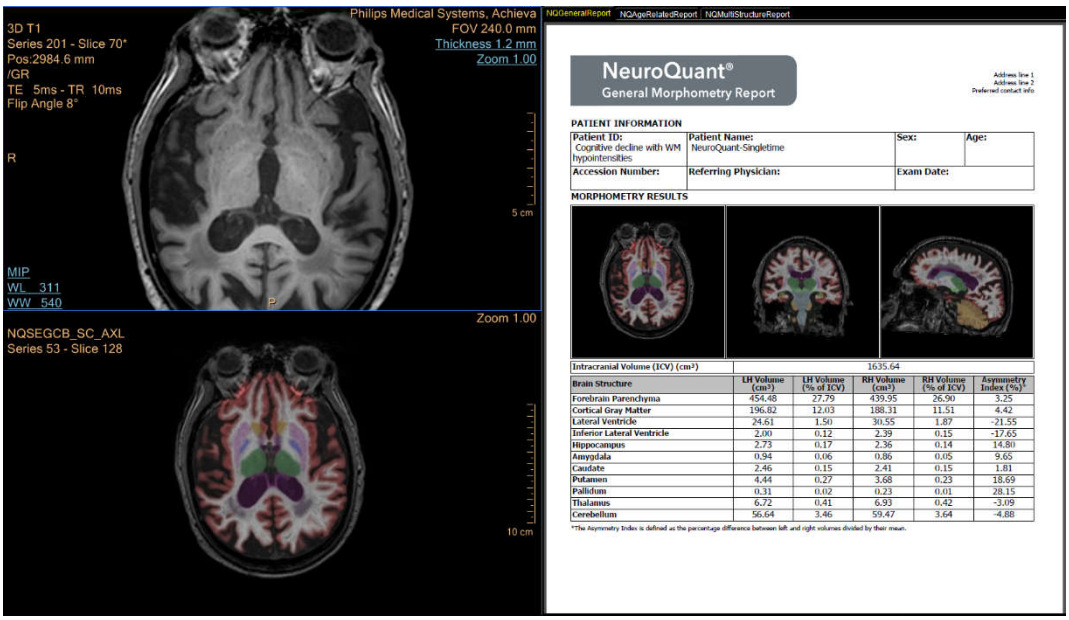

Fig. 1: NeuroQuant

Availability of reports depends on pre-purchases of licenses. NeuroQuant provides a licensing tool that allows you to monitor license levels.

To view the Cortech labs user manual while using NeuroQuant, click **NeuroQuant Help** below the toolbar in the side panel and then click **View Manual** in the **NeuroQuant Help** panel.

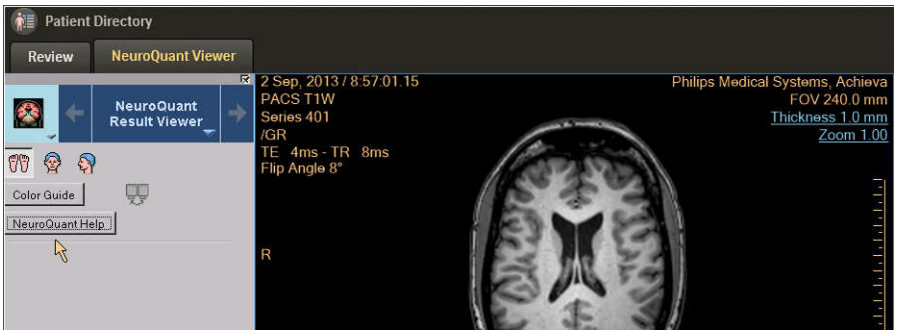

Fig. 2: NeuroQuant Help button

The **NeuroQuant Help** panel also provides information about your software version and device ID.

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4 Creating a Single Time Point Report

You can create a report based on a single time point or on multiple time points:

- A single time point report creates a report based on the information in the selected series only.
- A multiple time point report compares information in the selected series with additional or follow-up series for the same patient, providing an indication of change over time.

The following procedure guides you through creating a single time point report. For details of creating a multiple time point report, see section “Creating a Multiple Time Point Report” on page 13.

1. Select the study of interest in the **Patient Directory**.

⇨ All series in the study are selected. Any existing NeuroQuant reports associated with the series are also selected.

2. Right-click a series, move the pointer over **Run Processing**, and then click **NeuroQuant Processing**.

⇨ The NeuroQuant application starts and the **Create NeuroQuant Reports** dialog box is displayed. Reports for which a license is available can be selected.

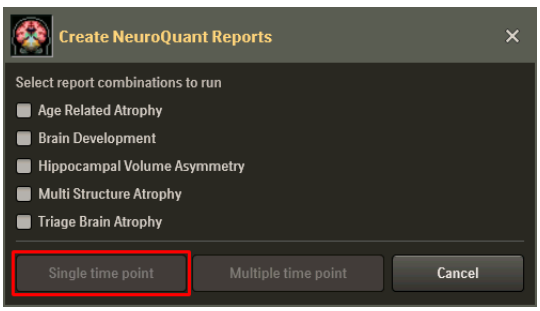

Fig. 3: Create NeuroQuant Reports dialog box

3. Select the reports that you want to create.
4. Click **Single time point**.

⇨ The report request is queued in the **Queue Manager**. A single report typically takes about 6 minutes to be created. You can view the progress of the request by clicking **Process** in the **Queue Manager** panel of the **Patient Directory** to display the **QueueManager** window. If there are multiple reports in the queue, an indication of the remaining number of reports is displayed. You can track the report request in the **Transfer** tab and the **Processing** tab.

⇨ When the report is completed, it is displayed in the study with the original series. The report and the reference images are available in several formats, all of which are available as separate series in the study:

- The requested report in PDF format and secondary capture format
- Secondary captures of the color-coded axial, sagittal, and coronal plane images (used in the report)
- General morphometry report in PDF format and secondary capture format

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5. You can open the report in the NeuroQuant Viewer to view details of the report. For details, see section “Using the NeuroQuant Viewer” on page 17.

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5 Creating a Multiple Time Point Report

You can create a report based on a single time point or on multiple time points:

- A single time point report creates a report based on the information in the selected series only.
- A multiple time point report compares information in the selected series with additional or follow-up series for the same patient, providing an indication of change over time.

The following procedure guides you through creating a multiple time point report. For details of creating a single time point report, see section “Creating a Single Time Point Report” on page 11.

1. Select the latest available study for the patient in the **Patient Directory**.

⇨ All series in the study are selected. Any existing NeuroQuant reports associated with the series are also selected.

2. Right-click a series, move the pointer over **Run Processing**, and then click **NeuroQuant Processing**.

⇨ The NeuroQuant application starts and the **Create NeuroQuant Reports** dialog box is displayed. Reports for which a license is available can be selected.

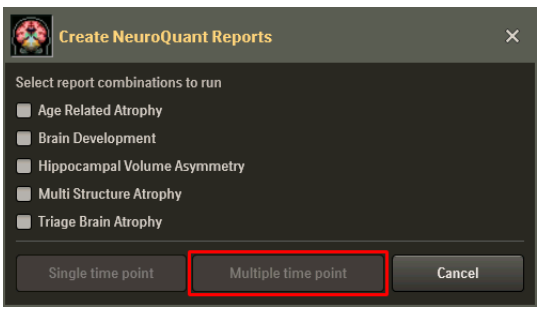

Fig. 4: Create NeuroQuant Reports dialog box

3. Select the reports that you want to create.
4. Click **Multiple time point**.

⇨ The **Multiple Time Point Study Selector** dialog box is displayed, indicating all available prior studies.

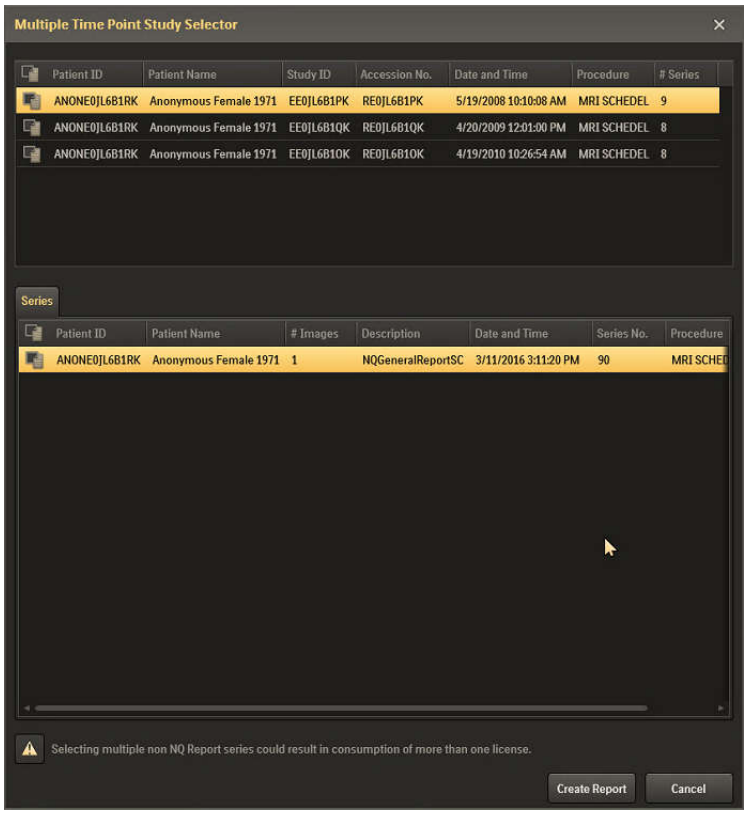

Fig. 5: Multiple Time Point Study Selector

⇨ When you select a study, available series are displayed in the **Series** list below the studies. If there is a report available in the study a single entry is displayed in the **Series** list representing the report, and an icon is displayed at the start of the row:  . If there are no reports available, all original series are shown in the **Series** list.

5. Select the studies that contain prior series that you want to include in the report. To select multiple items, press CTRL and select the items that you want to include.

NOTICE

If a prior study already contains NeuroQuant reports, it is sufficient to just select the study. However, if there are no NeuroQuant reports available in a study, you should select the 3D T1 series from the **Series** panel to include it.

⇨ When the report is created, the series are automatically segmented in the correct chronological order.

⇨ Series that you include that already contain a NeuroQuant report do not use a license (the existing report data is reused). Each series that you include and that does not contain NeuroQuant reports will use a license.

6. Click **Create Report**.

⇨ The report request is queued in the **Queue Manager**. You can view the progress of the request by clicking **Process** in the **Queue Manager** panel of the **Patient Directory** to display the **QueueManager** window. If there are multiple reports in the queue, an indication of the remaining number of reports is displayed. You can track the report request in the **Transfer** tab and the **Processing** tab.

⇨ When the report is completed, it is displayed in the study with the original series. The report and the reference images are available in several formats, all of which are available as separate series in the study:

- The requested report in PDF format and secondary capture format
- Secondary captures of the color-coded axial, sagittal, and coronal plane images (used in the report)
- General morphometry report in PDF format and secondary capture format

NOTICE

When a multiple time point report is created, either manually or by automatic processing, the reports that are generated for all relevant studies are sent to the location containing the corresponding original MR study, which may also be a PACS.

7. You can open the report in the NeuroQuant Viewer to view details of the report. For details, see section “Using the NeuroQuant Viewer” on page 17.

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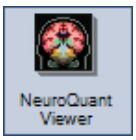
6 Using the NeuroQuant Viewer

You can view NeuroQuant reports in the NeuroQuant Viewer.



1. Select the original series that contains the report that you want to view, and then launch the **NeuroQuant Viewer** analysis application.

⇨ The original MR series, the segmented color-coded images, and the NeuroQuant PDF reports are loaded in a 2+1 layout, allowing you to view all information side-by-side.

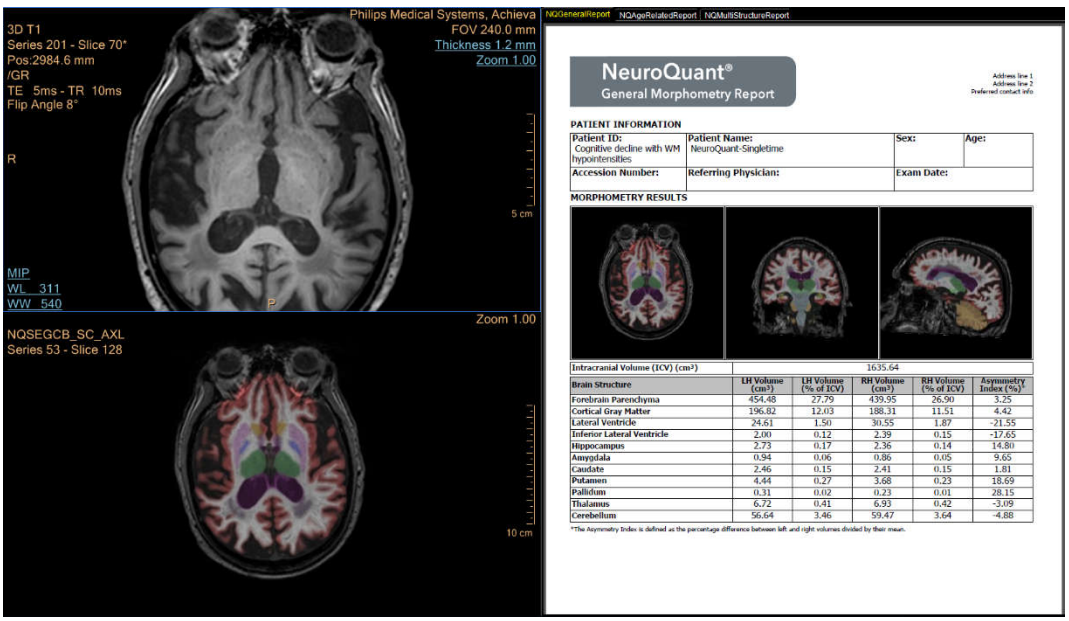


Fig. 6: NeuroQuant Viewer main screen

NOTICE

If you enable dual-screen viewing in the toolbar  the PDF report viewer is moved to the second monitor

NOTICE

An on-screen message may be displayed if one of your licenses is getting low or approaching its expiry date.

⇨ All available reports are displayed in the PDF report viewer on the right side. Each report has a tab at the top of the viewer. You can switch between reports by clicking the tabs.

⇨ In the report, the current scan is represented by a marker at the corresponding age of the patient.

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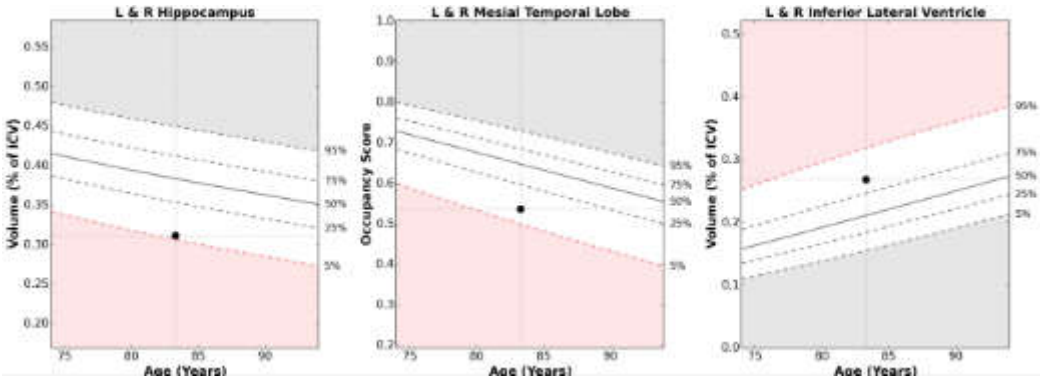

Fig. 7: NeuroQuant report

⇨ When you view a multiple time point report, a marker is displayed at the corresponding patient age for each additional series. This allows you to view the trend of a progressive disease and the response to treatment.

NOTICE

For full details of the information contained in the report, refer to the NeuroQuant manual provided by CoreTech.

⇨ The task guidance panel displays the selected series.

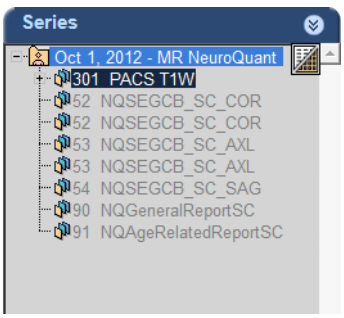

Fig. 8: NeuroQuant task guidance panel

⇨ To switch the series display between a list and pictorials, click the series switch icon: 

2. To view the original series or the color-coded series in detail, double-click it.

⇨ The series is displayed in the full viewing area. Double-click the series again to return to the 2+1 layout. (It is not possible to enlarge the PDF report in this way.)

3. To change the orientation of the original series and the color-coded series, use the orientation tools on the toolbar.

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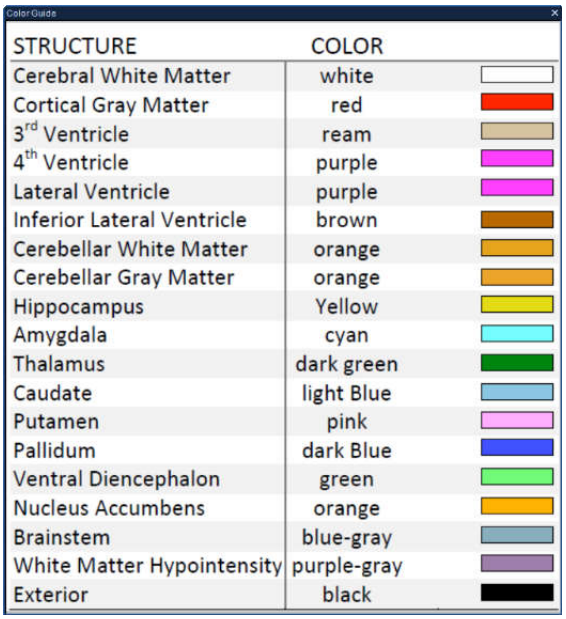
Fig. 9: Orientation tools on the toolbar

4. To view the color guide, which indicates the colors that are used to display structures in the color-coded series, click **Color Guide** in the toolbar.

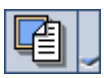


STRUCTURE	COLOR
Cerebral White Matter	white
Cortical Gray Matter	red
3rd Ventricle	ream
4th Ventricle	purple
Lateral Ventricle	purple
Inferior Lateral Ventricle	brown
Cerebellar White Matter	orange
Cerebellar Gray Matter	orange
Hippocampus	Yellow
Amygdala	cyan
Thalamus	dark green
Caudate	light Blue
Putamen	pink
Pallidum	dark Blue
Ventral Diencephalon	green
Nucleus Accumbens	orange
Brainstem	blue-gray
White Matter Hypointensity	purple-gray
Exterior	black

Fig. 10: Color Guide

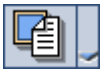
5. You can view the series using **Scroll**, **Pan**, and **Zoom** tools in the common tools panel.
6. You can use the tools available in the common tools panel to create measurements, ROIs, angles, and annotations on the original series and the color-coded series. (The common tools that are available in NeuroQuant function in a similar manner to the tools in MR Cardiac Analysis.)

7. To save a report as a PDF on your local system, do the following:
   - Display the report that you want to save.
   - Click the arrow next to the **Save** tool in the common tools panel, and then click **Save selected pdf**.
   - Choose a destination for the PDF on your local system and save it.

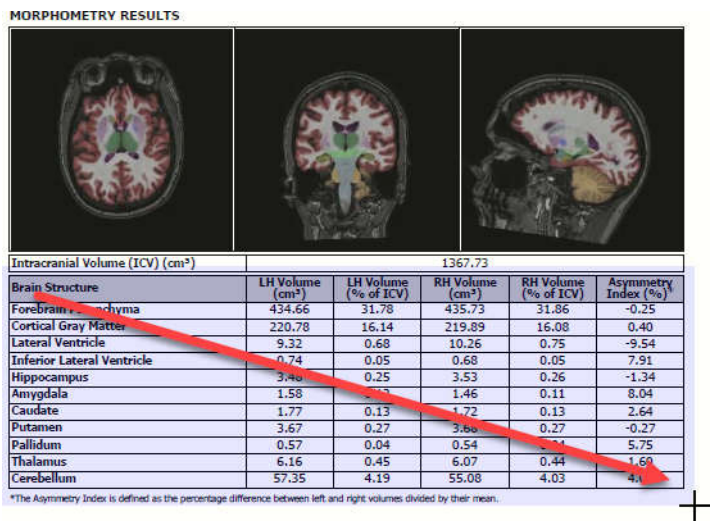


8. To add a complete report to the IntelliSpace Portal reporting application, do the following:
   - Display the report that you want to add.

- Click the arrow next to the **Send** tool in the common tools panel, and then click **Send Findings To Report**.
- If you are prompted by the **Select Existing Report** dialog box, select the report that you want to send the NeuroQuant report to, and then click **OK**. If there are no existing reports, the NeuroQuant report is automatically added to a new report.



9. To send a portion of a PDF report (for example, a data table or graph) for inclusion in the IntelliSpace Portal reporting application do the following:
   - Display the report that contains the information that you want to add.
   - Click the arrow next to the **Send** tool in the common tools panel, and then click **Select and Copy Table**.
   - Move the pointer over the report. The pointer changes to a cross. Drag in the report over the portion that you want to use (you are not restricted to tables, any part of the report can be selected), and then release the mouse button.
   - If you are prompted by the **Select Existing Report** dialog box, select the report that you want to send information to, and then click **OK**. If there are no existing reports, the selected portion of the NeuroQuant report is automatically added to a new report. The selected portion is also copied to the clipboard, allowing you to paste the information into another application (for example, a word-processing document), if desired.


MORPHOMETRY RESULTS

Intracranial Volume (ICV) (cm³)	1367.73				
Brain Structure	LH Volume (cm³)	LH Volume (% of ICV)	RH Volume (cm³)	RH Volume (% of ICV)	Asymmetry Index (%)*
Forebrain [illegible]chyma	434.66	31.78	435.73	31.86	-0.25
Cortical Gray Matter	220.78	16.14	219.89	16.08	0.40
Lateral Ventricle	9.32	0.68	10.26	0.75	-9.54
Inferior Lateral Ventricle	0.74	0.05	0.68	0.05	7.91
Hippocampus	3.48	0.25	3.53	0.26	-1.34
Amygdala	1.58	[illegible]	1.46	0.11	8.04
Caudate	1.77	0.13	1.72	0.13	2.64
Putamen	3.67	0.27	3.68	0.27	-0.27
Pallidum	0.57	0.04	0.54	[illegible]	5.75
Thalamus	6.16	0.45	6.07	0.44	1.69
Cerebellum	57.35	4.19	55.08	4.03	4.[illegible]

*The Asymmetry Index is defined as the percentage difference between left and right volumes divided by their mean.

Fig. 11: Copy a portion of a NeuroQuant report by dragging across the information that you want to use

NOTICE

When you copy and paste a portion of a NeuroQuant report, a Cortech labs logo is added below the copied item when it is pasted in a new location.

10. You can also use the following media management functions in IntelliSpace Portal:use the and functions to create bookmarks and save key images for use in the IntelliSpace Portal reporting application.

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- Click **Save Bookmark**  in the common tools panel to create and save a bookmark of your current workflow.
- Press Space or Shift+Space to store a key image.
- Click the arrow next to the **Save** button  to save images from the series or a screen snapshot.
- Click the arrow next to the **Film** button  to send images from the series or a screen snapshot to the IntelliSpace Portal print application.

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7 Setting NeuroQuant Preferences

Preferences are available to view and configure the following features in NeuroQuant:

- Viewing available report licenses
- Defining preferred PACS
- Configuring automatic processing
- Setting cut and paste preferences

Viewing Available Report Licenses

1. Click **Preferences** in the **Directory** screen to open the **Preferences** dialog box.
2. Click the **MR** expander in the list of preferences on the left side of the **Preferences** dialog box to display options for MR applications.
3. Click **Processing**.
4. In the **NeuroQuant Processing** section, click **Licenses status**.

⇨ A dialog box is displayed, indicating the number of licenses remaining for available reports and their expiry date. Licenses that are getting low or approaching their expiry date are shown with details in red. Click **OK** to close the dialog box.

NOTICE

When licenses are low or approaching their expiry date, this dialog box is displayed automatically when you launch the NeuroQuant Viewer or the Portal Management Tool.

Defining Preferred PACS

In locations with multiple PACS available, you can define the PACS that are relevant for Neurology studies. This improves the performance of multiple time point report generation in NeuroQuant.

1. Click **Preferences** in the **Directory** screen to open the **Preferences** dialog box.
2. Click the **MR** expander in the list of preferences on the left side of the **Preferences** dialog box to display options for MR applications.
3. Click **Processing**.
4. In the **NeuroQuant Processing** section, click **Configure Priors**.
5. Select the PACS are that relevant for Neurology studies, and click **OK**.

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Configuring Automatic Processing

Manual processing of reports takes about 6 minutes to complete. However, to accelerate your workflow, you can set up automatic processing rules that generate specific NeuroQuant reports for matching series as they are received on IntelliSpace Portal. You can configure rules based on one or more DICOM attributes, such as series description or body part examined.

The following procedure guides you through the configuration of automatic processing rules.

NOTICE

MR application preferences can only be changed by an Administrator or a Clinical Administrator.

1. Click **Preferences** in the **Directory** screen to open the **Preferences** dialog box.
2. Click the **MR** expander in the list of preferences on the left side of the **Preferences** dialog box to display options for MR applications.
3. Click **Processing**.
4. In the **NeuroQuant Processing** section, click **Add Report** to add a rule.

   ⇨ You configure the rule using the following steps.
5. Click the arrow in the **Report** column and select a report type from the drop-down list.

NOTICE

Only licensed reports are displayed in the list.

6. Click **Edit** at the end of the row to display the **Configure Rule** dialog box.

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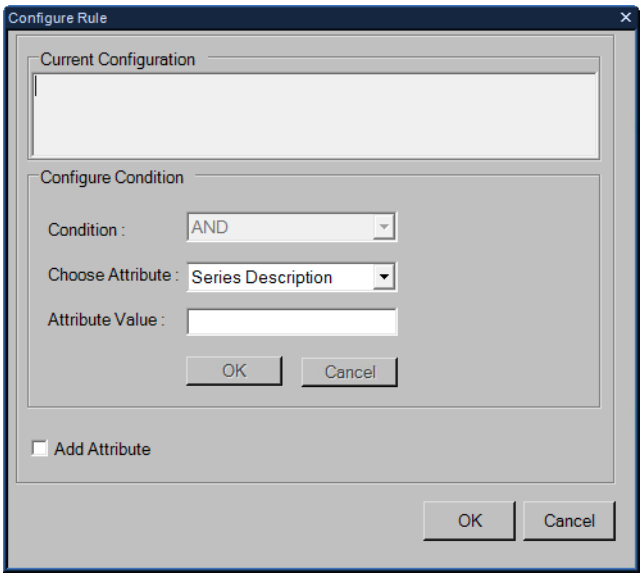

Fig. 12: Configure Rule dialog box

7. Click the **Choose Attribute** list and select an attribute from the drop-down list.
8. Enter a value for the attribute in the **Attribute Value** box and click **OK** (just beneath the **Attribute Value** box).

⇨ The rule is added to the **Current Configuration** box at the top of the **Configure Rule** dialog box, indicating the conditions for which matching series will automatically be processed for the corresponding report type.

NOTICE

By implementing automatic processing, report licenses will be consumed as needed to create reports without notification.

9. You can implement this rule as it is, or you can add one or more additional conditions to refine the rule further.
   - To implement the rule, click **OK** at the bottom of the dialog box.
   - To add a condition, select an attribute, enter a value, and then set the **Condition** to **AND** (all attributes must match) or **OR** (any attributes must match).Click **OK** just beneath the **Attribute Value** box to add the condition to the existing configuration. Continue building the condition or click OK at the bottom of the dialog box to implement the rule.

NOTICE

A small selection of DICOM attributes are included in the attributes list by default. You can add more DICOM attributes by selecting **Add Attribute** below the **Configure Condition** section of the **Configure Rule** dialog box.

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NOTICE

If there are matching prior NeuroQuant reports available for a patient when automatic processing is triggered on receipt of a study, then a multiple time point report is automatically generated. If there are no prior NeuroQuant reports available, a single time point report is created.

10. Continue adding rules for report types until all desired automatic processing scenarios are configured.

Setting Cut and Paste Preferences

1. Click **Preferences** in the **Directory** screen to open the **Preferences** dialog box.
2. Click the **MR** expander in the list of preferences on the left side of the **Preferences** dialog box to display options for MR applications.
3. Click **Processing**.
4. If you intend to copy parts of your NeuroQuant reports for inclusion in reports on IntelliSpace Portal, select **Include "Select and copy table" in report** in the **NeuroQuant Processing** section.

NOTICE

If you do not intend to copy data in your reports to IntelliSpace Portal, or if you only intend to copy data to another application, such as a word processing application or presentation application, then we recommend that you do not select this option (to maintain system performance).

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