![brainreader logo]

Customizable Report
for Neuroreader® 2.7.0

GUIDE

INTRODUCTION

Dear customer,

The Neuroreader® software version NR 2.7.0 provides a customizable report for users of Mediation Server MS 3.3.0 and later versions.

On the following pages you will understand the purpose of each part and which parts are customizable.

You can design the report to be detailed and specific to your exact needs.

Contact Client Services if you wish to customize your Neuroreader® Report. Technical Support will set the report up for you based on your needs.

Email: Support@brainreader.net
Phone: 888-994-4861

Kind regards,
The Brainreader Team

Disclaimer: Brainreader disclaims clinical liability for the customized reports.

THE STANDARD NEUROREADER® REPORT CONSISTS OF 10 PARTS

1. User Information
2. Reference Head Size
3. Left-Right Asymmetry Index
4. Brain Volume Assessment
5. Summary
6. Quality Assessment Overlay Images
7. Brain Heat Maps
8. Charts
9. Longitudinal Charts
10. Brain Segmentation Color Table

In the customizable Neuroreader® Report, you can include 9 parts in the patient report or just those parts that are relevant. The different parts can also be freely moved to any desired location in the report.

NEUROREADER ®

REPORT

Analysis Date:	2022-Aug-01 11:07:16	Patient Name:	
Report Type:	Neuroreader® Report	Accession Number:	
NR Upload ID:	BrBr_20220801_012	Birth Date:	01-01-1
Group Name:	DEMO	Gender:	Male
Study ID:		Age:	72
Patient ID:	45536		

Reference Head Size

The measured total intracranial volume (mTIV)

	2118 mL

Left-Right Asymmetry Index

Structures	Asymmetry Index	NR Index*	Z-score	Percentile
Hippocampus	0.063918	11.64	0.77	77.81
Amygdala	-0.021099	1.92	0.13	55.03
Caudate	0.102133	15.84	1.04	85.13
Lateral Ventricle	0.109361	0.88	0.06	52.30
Pallidum	-0.013062	-8.09	-0.53	29.73
Putamen	0.016906	-1.56	-0.10	45.91
Thalamus	-0.122106	-26.54	-1.75	4.04
Ventral Diencephalon	0.000205	1.89	0.12	54.95
Cerebellum	0.002228	3.40	0.22	58.84
Frontal Lobe	-0.005513	-2.00	-0.13	44.77
Parietal Lobe	-0.023012	-7.58	-0.50	30.91
Occipital Lobe	0.035018	0.96	0.06	52.52
Temporal Lobe	-0.041678	-6.47	-0.43	33.50

Brain Volume Assessment

Structures	Color	Vol mL	Vol/mTIV in (%)	NR Index*	Z-score	Percentile
Whole Brain Matter	n/a	1107.24	52.29	-8.07	-0.53	29.78
Gray Matter	n/a	552.00	26.07	-7.31	-0.48	31.52
White Matter	n/a	555.24	26.22	0.35	0.02	50.93

NR Upload ID: BrBr_20220801_012
GUDID 05700002060471 Hardware profile 1C

NR 2.7.0
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1: USER INFORMATION

The patient information part is obligatory and includes the information concerning the patient, and the images being analyzed.

The patient information part contains:

- ▶ Analysis Date
- ▶ Report type
- ▶ NR Upload ID
- ▶ Group Name
- ▶ Study ID
- ▶ Patient ID
- ▶ Patient Name
- ▶ Accession Date
- ▶ Birth date
- ▶ Gender
- ▶ Age

2: REFERENCE HEAD SIZE

This corresponds to the measured Total Intracranial Volume (mTIV) in mL. The mTIV/Reference Head Size is displayed separately from the other structures since it is used as the reference volume on which the statistical values are based.

3: LEFT-RIGHT ASYMMETRY INDEX

This table lists the Left-Right Asymmetry Index, Neuroreader® Index (NR Index), the Z-score, and the Percentile for all structures that are on both sides of the brain. It is possible to include all or only some of the columns.

There are 13 structures included in the standard report. It is possible to order the left-right Asymmetry Index for another 13 structures, totaling 26 structures.

Structures in the standard report: Hippocampus, amygdala, caudate, lateral ventricle, pallidum, putamen, thalamus, ventral diencephalon, cerebellum, frontal lobe, parietal lobe, occipital lobe, and temporal lobe.

Structures in the customizable report: All 13 structures from the standard report plus cerebellar GM and cerebellar WM, cerebrum, cerebral GM, cerebral WM, frontal lobe GM, frontal lobe WM, parietal lobe GM, parietal lobe WM, occipital lobe GM, occipital lobe WM, temporal lobe GM and temporal lobe WM).

4: BRAIN VOLUME ASSESSMENT

In the standard report, the Brain Volume Assessment table compares 64 volumes to the normative database and provides the percentile for all 64 volumes.

In the customized report you can get up to 83 volumes. In the customized report, you can also choose to include only those structures that you want to see displayed.

The Brain Volume Assessment Table includes a table containing a list of all the segmented structures that displays the following elements (in the customized report you can choose which ones to include):

- A color code
- Volume in mL
- Vol/mTIV ratio (%)
- NR Index
- Z-score
- Percentile

The volumes presented in the report are displayed in different colors for each structure.

The following structures: Frontal-, Parietal-, Occipital, Temporal Lobe and Cerebellum are delimited in gray/white matter and left/right and the lateral ventricle in left/right. For each of the delimited structures a specific color is shown, see the colors showed in the color column in the Brain Volume Assessment table.

- Structures with a percentile between the 25th and 75th percentile are colored in black
- All brain matter volumes with a percentile lower than 25% and all CSF structures with a percentile over 75% are colored in orange.

In the customized reports you can choose different lower and upper percentiles different from the standard report.

Definitions:

Vol mL: Volume in milliliters.

Vol/mTIV ratio (%): Volume to the measured Total Intracranial Volume ratio in percentage.

NR Index: The Neuroreader® Index (NR Index) is a legacy Brainreader calculation based on the predicted value. It shows the small differences between the predicted volume calculated based on the normative database and the actual measured volume.

Z-score: Indicates where the statistical value is situated within the normative database.

Percentile: Indicates the percentile where the volume is situated within the normative database.

5: SUMMARY

The third part is a summary. It lists all the brain structures in orange and all the ventricles in orange below 25% and above 75% for the standard report. It may differ for the customized report, if different upper and lower percentiles are chosen.

Example:

Summary

All brain matter volumes with a percentile lower than 25% and all CSF structures with a percentile over 75% (orange font):

- Putamen (4.81%)
- Right Putamen (7.57%)
- Left Putamen (3.44%)

- CSF (+ dura) (85.88%)

6: QUALITY ASSESSMENT OVERLAY IMAGES

The fourth part previews the quality of the segmentation in the form of small anatomical images of the segmentation superimposed onto the original brain MR images.

This feature is intended for quality assessment of the images. The colors used for each structure are the same which are displayed in the Brain Volume Assessment table.
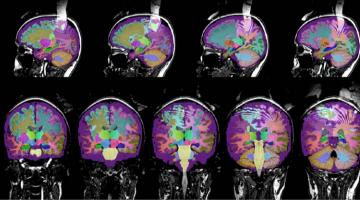
Quality check

The results presented in the Neuroreader® Report are dependent upon the following:
- ▶ The quality of the input image:
  - ▶ The whole head should be visible on the MRI
  - ▶ The skull should be intact and within the field of view
  - ▶ No motion artifacts
  - ▶ A good signal to noise ratio
- ▶ The quality of the segmentation should be checked by making sure that colors of the segmentation follow the boundaries of the brain.
- ▶ If there are any quality issues, please contact support@brainreader.net.
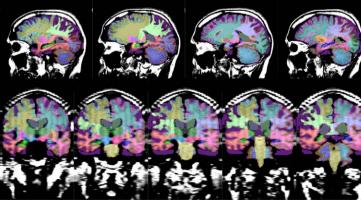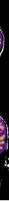
Example of correct scan:
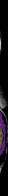

Example of incorrect scan due to artefacts:

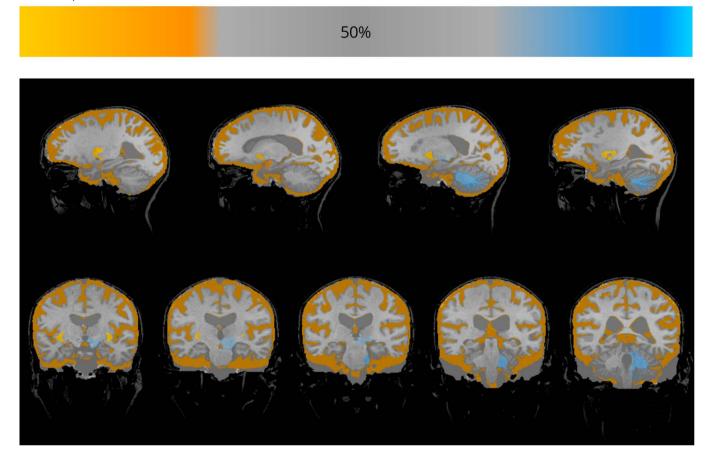Example of incorrect scan due to too few slices:

7: BRAIN HEAT MAPS

The Brain Heat Maps visualize the percentile values of the brain. It is shown in a color gradient ranging from orange to blue.

The orange color indicates all brain structure volumes with a low percentile and all CSF and ventricular structures with a high percentile.

The orange colors represent the structures colored in orange in the Brain Volume Assessment table, which are the areas of concern.
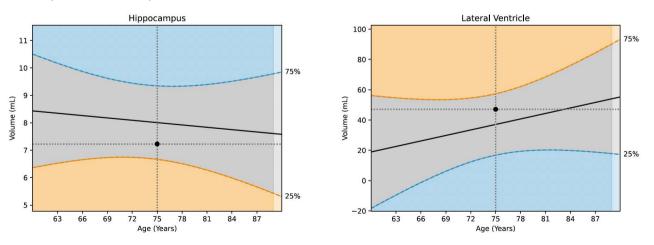
Example:

8: CHARTS

This part shows the volume of different brain structures in six different charts. The chart shows the volume in mL on the y-axis and age on the x-axis. It also shows the limits of the 25th, 50th and 75th percentiles based on the normative database.

The Charts part shows per default plots of the Hippocampus, Frontal-, Temporal-, Parietal-, and Occipital Lobe in a normative chart with volume of the structures in orange depicting values below 25% percentile and a plot of Lateral Ventricle with orange depicting values above 75% percentile. The black line in the middle is the 50% percentile.

In the customizable report it is possible to choose specific structures to be displayed in the chart and as many charts as needed.

Example of two plots:
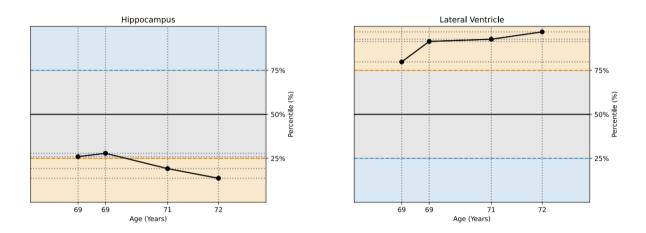
9: LONGITUDINAL CHARTS

This part shows the longitudinal progression of the percentiles of structures in individual charts. Each chart shows the percentile on the y-axis and age on the x-axis. It also shows the limits of the 25th, 50th and 75th percentiles based on the normative database.

To ensure the most accurate results, all MRI studies must be using the same MRI Protocol and the same scanner each time for a single patient.

The longitudinal charts allow the physicians to see an evaluation and progression of the patient's data over time. The longitudinal information also adds value to the physician's precision and aids in giving the patients a correct treatment plan. The physician can furthermore monitor disease response depending on the treatment.

The longitudinal Charts shows per default the same six structures as in the Charts (Hippocampus, Frontal-, Temporal-, Parietal-, and Occipital Lobe). With the customizable report it is possible to display any of the structures and as many charts as needed.

Example of two charts with four different time points. The first two scans are done at age 69, one scan is done at age 71 and one scan at age 72:

10: BRAIN SEGMENTATION COLOR TABLE

The color table is used as a reference table for the segmentation shown in the Brain Volume Assessment (part 2) and in Quality Assessment Overlay images (part 4).

Example:

Id	Color	Label	Red	Green	Blue
53		Right Hippocampus	0	255	0
17		Left Hippocampus	0	0	255
54		Right Amygdala	255	255	0
18		Left Amygdala	0	255	255
51		Right Putamen	255	0	255
12		Left Putamen	255	128	0
49		Right Thalamus	128	255	0
10		Left Thalamus	0	255	128
60		Right Ventral Diencephalon	0	128	255
28		Left Ventral Diencephalon	255	0	128
52		Right Pallidum	128	0	255

Thank you for reading this guide.

CONTACT US

Email:
support@brainreader.net

Phone:
United States and Canada: 1-888-994-4861
Rest of World: +45 5352 4749

www.brainreader.net

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