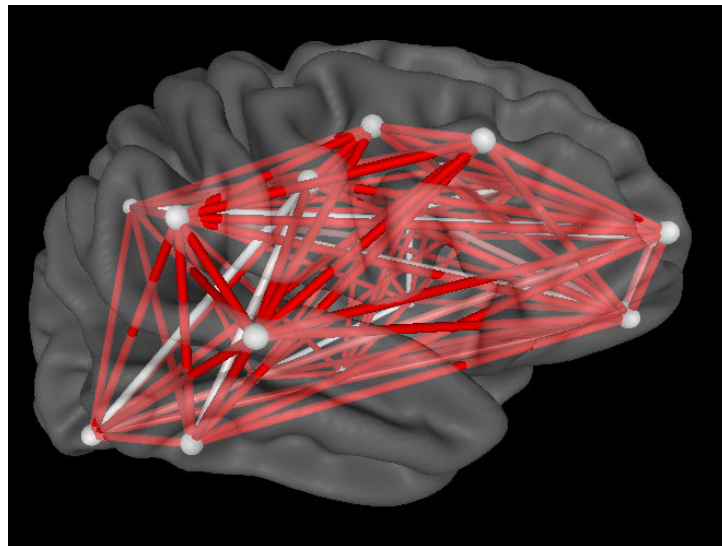


NeuroLink by Applied Neuroscience, Inc.

Help Manual

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Largo, FL 33777-1355

For More Information Contact: info@aneneurolink.com
For Support Contact: support@aneneurolink.com
or Call 727-244-0240

www.aneneurolink.com

NeuroLink by Applied Neuroscience, Inc. Help Manual

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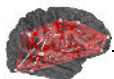


Table of Contents

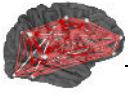
Part I Getting Started	6
Introduction	6
Installing NeuroLink.....	13
How to Purchase.....	14
Demo Mode	15
Activating NeuroLink.....	16
Support and Updates.....	18
Part II Using NeuroLink	20
Patient Information.....	20
Self-Assessment of Symptoms.....	21
Charts of Symptom Severity.....	24
Charts of Symptom History.....	25
Save Images & Data File.....	27
Part III Using NeuroGuide	32
Import NeuroLink.....	33
Link Symptoms to Networks.....	34
Start Neurofeedback.....	35
Index	38

NeuroLink Help Manual and Tutorial

Part **I**

Getting Started

www.anineurolink.com



Getting Started

Table of Contents

[Introduction to NeuroLink](#)  6

[How to Install NeuroLink](#)  13

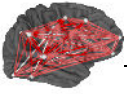
[How to Activate NeuroLink](#)  16

[Demo Mode](#)  15

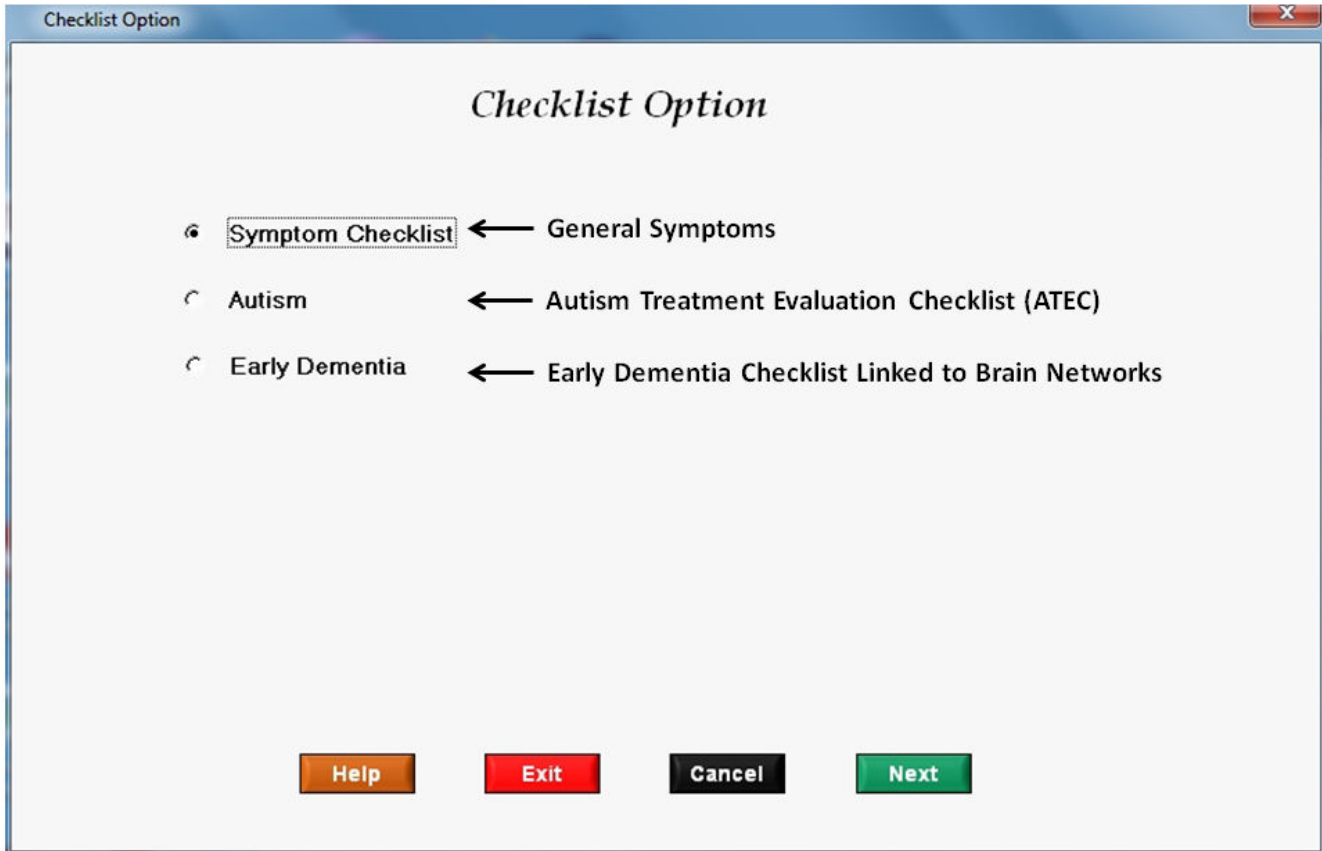
[Support and Upgrades](#)  18

Self-Assessment Symptom Check List

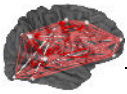
NeuroLink includes a set of a Self-Assessment Symptom check lists that can be used by a patient or client with different clinical histories or diagnoses and symptoms. The general Symptom Check List includes 55 items that are sub-divided into ten brain networks based on the fMRI, PET and EEG/MEG scientific literature. The questionnaire is used by patients/clients to rank order the magnitude of various symptoms such as pain or depression or anxiety or memory problems, etc. The Autism questionnaire is the "Autism Treatment Evaluation Checklist" (ATEC) that has 77 items that are sub-divided into the four core components of "Language", "Sociability", "Language" and "Behavior" and mapped to different brain networks. The Early Dementia Questionnaire has 57 items that are mapped to 10 brain networks based on the fMRI, PET and EEG/MEG scientific literature. Each questionnaire produces bar graphs and radar maps as well as tab delimited output files and data that can be imported into NeuroGuide for purposes of EEG biofeedback (Neurofeedback) protocol generation. Changes in symptom severity can be tracked over sessions using the line graphs and radar maps inside of NeuroLink. This provides an immediate feedback of the relative rankings of symptoms. Below is the first panel when one opens NeuroLink:



Select Different Check Lists Depending on Categories of Symptoms



Below is an example of the 1st page of the general Symptom Check List:

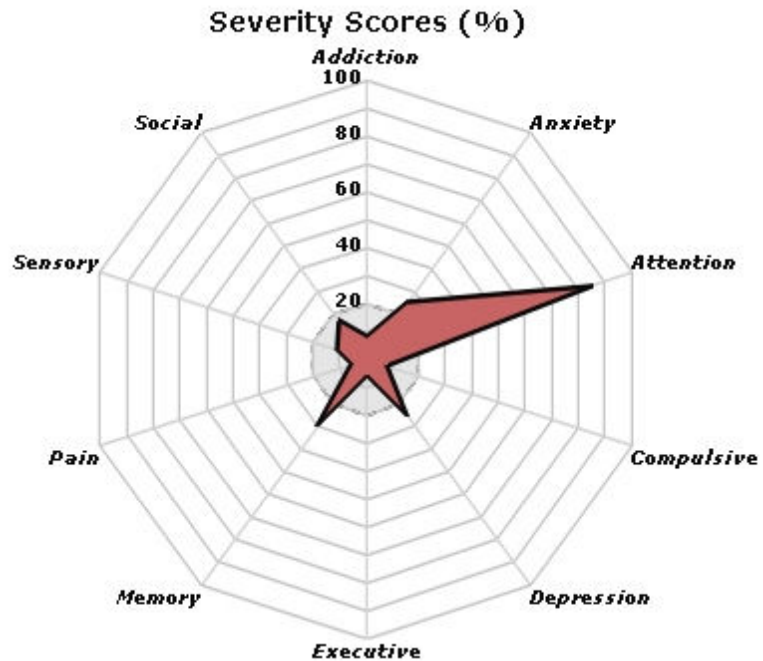
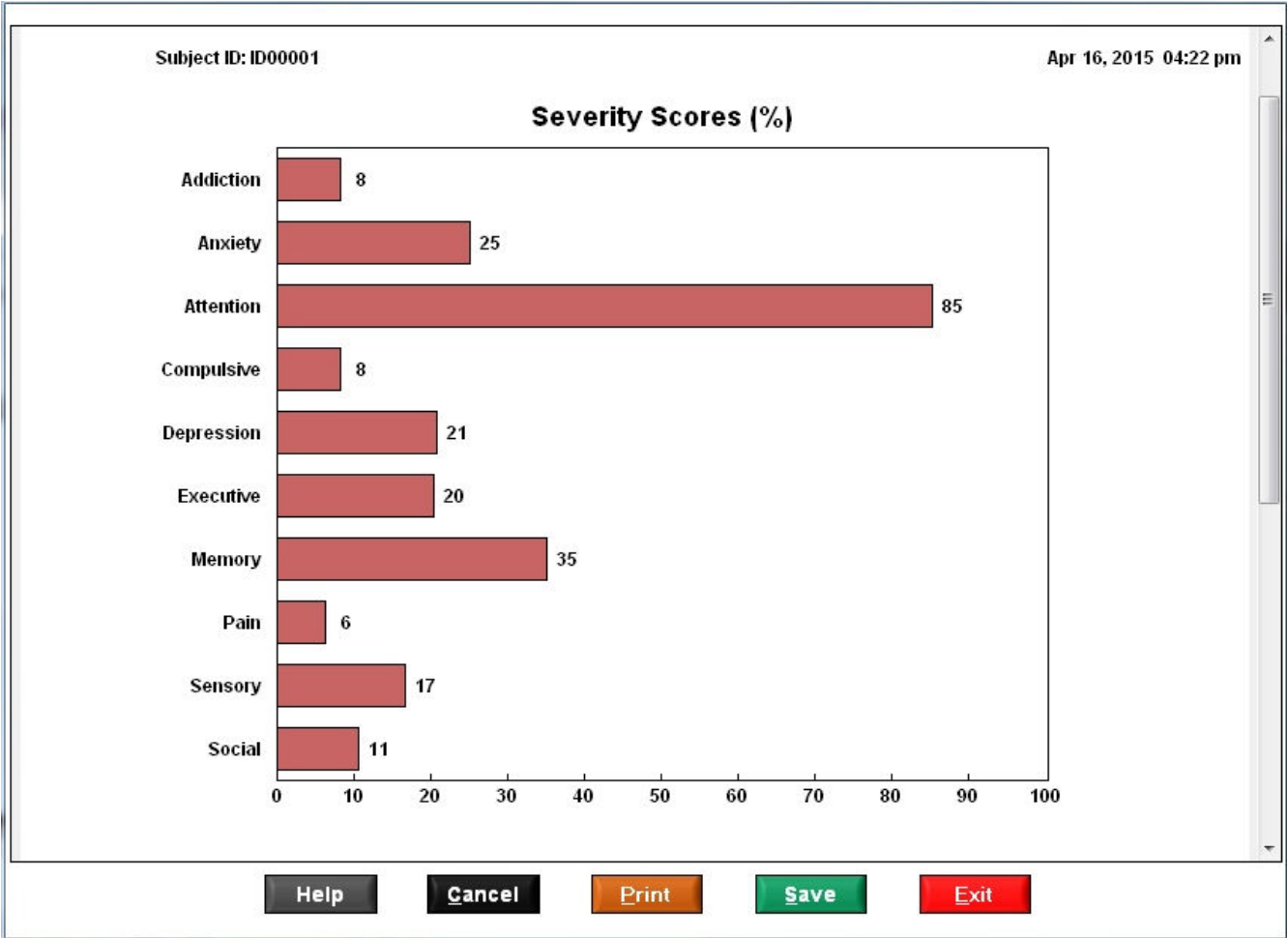
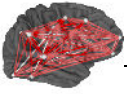


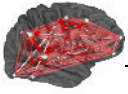
List of Subject's Symptoms or Complaints

For each Symptom and/or Complaint listed below, try and remember how you have felt over the past 1 to 4 weeks. Then slide the pointer on the scale directly below that Symptom/Complaint or click on the word to indicate how often you have experienced that Symptom/Complaint during that time. NOTE: Make sure that the sliding scale next to every Symptom/Complaint has some red color before clicking on the Next button.

I have cravings for alcohol or drugs	
I usually deny having any problems	
I am easily distracted	
People usually have to repeat words to me	
I have balance problems	

Below is an example of the Symptom Assessment feedback charts:





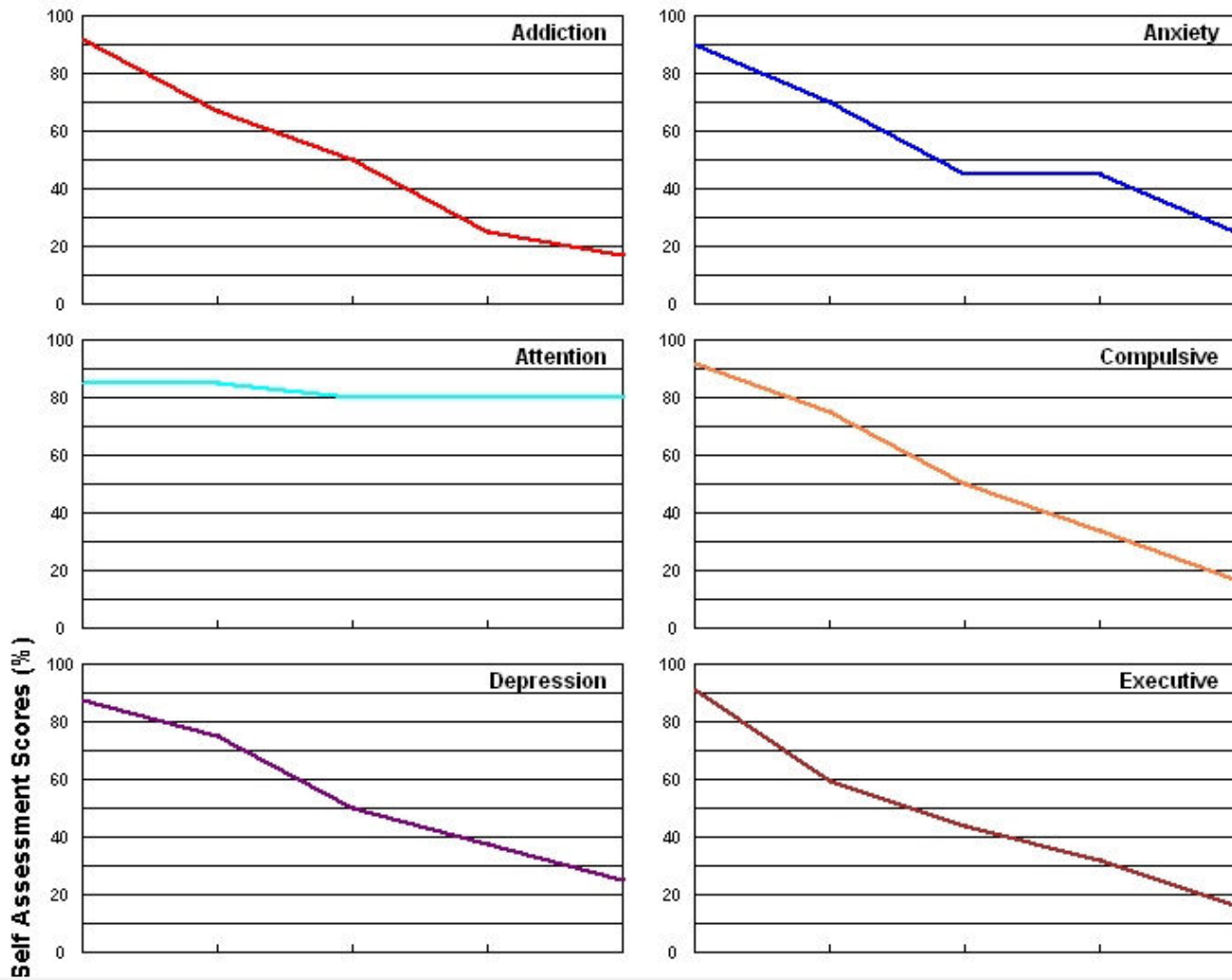
If an error was made or an incorrect symptom score was present then the patient/clinician can return to the self-assessment screen and make corrections.

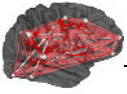
Self-Assessment Symptom History

NeuroLink is designed to facilitate and simplify symptom assessment by a clinician to identify the most troublesome symptoms and also view changes in symptoms over sessions. Below are examples of session history plots that allow clinicians to immediately evaluate the relative efficacy or lack thereof of treatments that they may have administered:

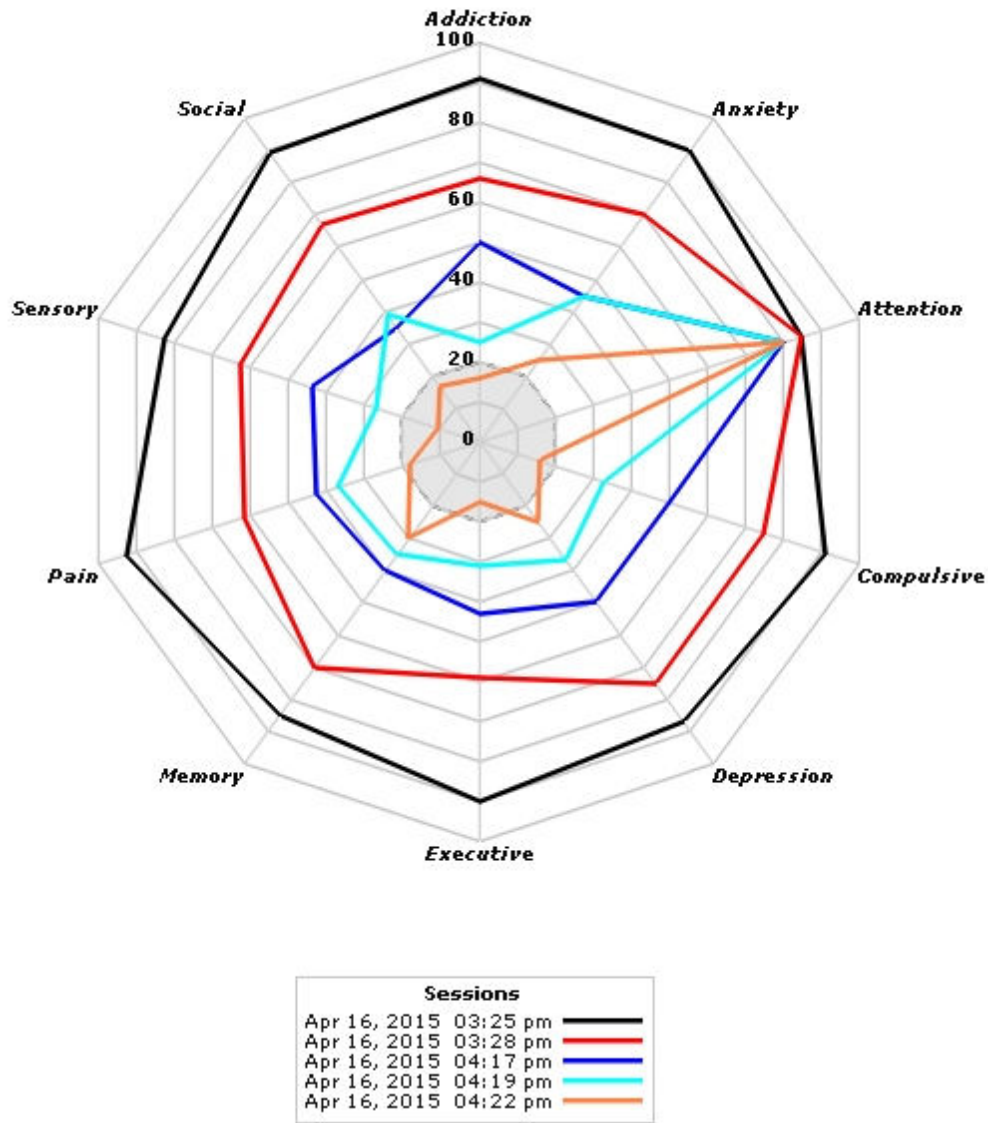
Subject ID: ID00001

Session History



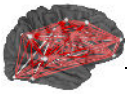


Session History of Severity Scores (%)



NeuroGuide's Neurofeedback to Link Patient's Symptoms to the Patient's Brain

NeuroLink facilitates linking a patient's symptoms to the dysregulated nodes and connections between nodes in networks of the brain related to the patient's symptoms. NeuroLink also saves the clinician time and effort and reduces the guess working in identifying the most troublesome symptoms and the brain network that can be targeted for Neurofeedback - all in a just two steps. This is a big savings in time and accuracy and facilitates the seamless integration of treatment and symptoms and the brain. Simply save the Self-Assessment *.nla file and then open the NeuroGuide Symptom



Check List Panel and select the NeuroLink tab and browse to the patient's folder as illustrated in the figures below:

Symptom Check List

Symptoms | ICN | Networks | Neuropsychological | DoD/VA | **NeuroLink**

Session: 1

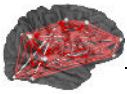
Z Score: 2.00

- Power
- Coherence
- Phase
- Phase Shift
- Phase Lock

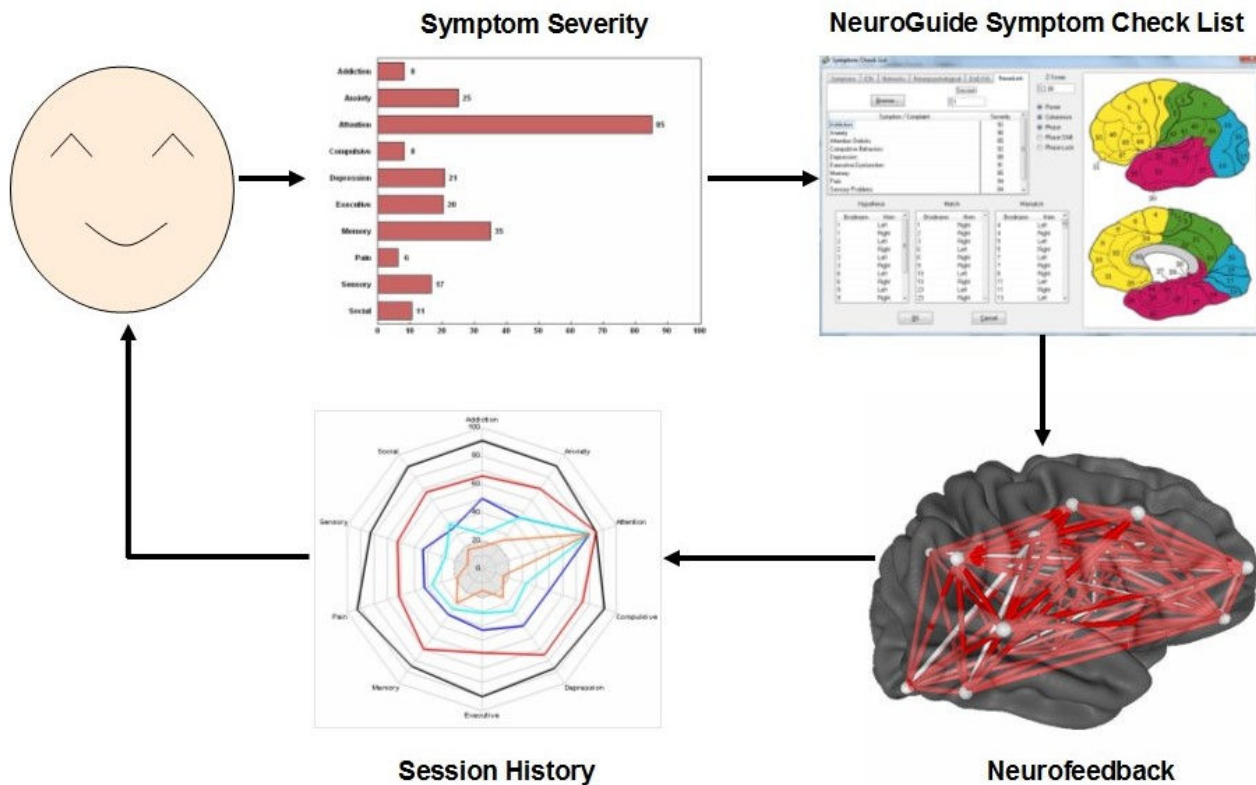
Symptom / Complaint	Severity
Addiction	92
Anxiety	90
Attention Deficits	85
Compulsive Behaviors	92
Depression	88
Executive Dysfunction	91
Memory	85
Pain	94
Sensory Problems	84

Hypothesis		Match		Mismatch	
Brodmann	Hem	Brodmann	Hem	Brodmann	Hem
1	Left	1	Right	4	Left
1	Right	2	Right	4	Right
2	Left	3	Right	5	Left
2	Right	6	Left	5	Right
3	Left	6	Right	7	Left
3	Right	9	Right	7	Right
6	Left	10	Left	8	Right
6	Right	10	Right	11	Left
9	Left	23	Left	11	Right
9	Right	23	Right	13	Left

OK Cancel



NeuroLink and NeuroGuide Integration – Linking Symptoms to the Brain



Visit www.anineurolink.com to learn more about NeuroLink

How to Install NeuroLink:

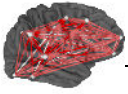
NeuroLink is a stand-alone program that runs with all versions of Microsoft Windows. It also runs inside of Mac computers in the bootcamp mode or with a Windows emulation program such as Parallels, etc.

Download NeuroLink at: www.anineurolink.com/download_NL.htm

After you download NeuroLink, make a backup copy of the zip folder that contains the NeuroLink installation files and keep it in a safe place such as a flash or thumb drive, in case you need to reinstall this version of NeuroLink.

Unzip or Extract the NeuroLink installation files from the .zip folder and save all the installation files to the same folder and note the location of that folder (be sure that all the installation files are in the same folder). To install NeuroLink open the folder with all the installation files, then open the Volume folder and double click on the setup.exe file.

We advise that one to always use the default directory of c:/Program Files or c:/Program



File(x86), depending on the version of Windows installed on your computer, for the installation directory.

If you have installed an earlier version of NeuroLink then uninstall will run first and then automatically proceed with the new install.

To launch NeuroLink after installation and copy and paste the key A that appears in the NLA security window. Depending on which version of Window you are currently using, do one or more of the following:

Click the Start button, select All Programs, select the NeuroLink Folder, then select NeuroLink; or

Click on the NeuroLink icon located on your Desktop and then copy and paste the Key A into an email to nla@anineurolink.com; or

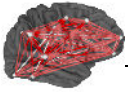
Click on the NeuroLink icon located in your Task Bar and then copy and paste the Key A into an email to nla@anineurolink.com; or

If you are using Window 8 or greater and prefer using the Start screen, go to the main Start screen, select the down arrow located in bottom left corner of the screen, On the App screen, on the top right of screen after the word Apps by..... click on the down arrow and select by date installed, Right Click on the NeuroLink icon and select Pin to Start and/or Pin to Task Bar

If you changed or shifted the installation to a different directory and have trouble using NeuroLink, please contact us by email at support@anineurolink.com

Order NeuroLink Using Our Online Merchant Account

Order NeuroLink and/or Add Ons by opening the order webpage at: www.anineurolink.com/Order.htm. Then click the Add to Cart button(s) in the order list below. **BE SURE TO INCLUDE YOUR EMAIL ADDRESS IN YOUR ONLINE ORDER.** Download the Demo Version of NeuroLink for FREE. Once you have paid for NeuroLink in full and/or made the first credit card payment then Copy and Paste (do not type) the KEY A sequence of encrypted letters and numbers that appears when you activate the Demo and email your KEY A to qeeg@appliedneuroscience.com. The computer that generated the key A will then be registered on the NeuroLink server and the number of self-assessments that you paid for will appear the 1st time that you use NeuroLink. The number of assessments will be decremented each time that NeuroLink is used. Computers using NeuroLink will be registered between 9 am and 3 pm EST - on week days. If a Key A is received on a Friday after 3 pm then the NeuroLink server registration will be issued on the following Monday.



Click the Add to Cart Button To Purchase NeuroLink

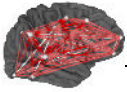
<u>NeuroLink Packages</u>			
# Assessments	Price Per Assessment *	Total	Purchase
10	\$10	\$100	
25	\$8	\$200	
50	\$6	\$300	
* Must Own NG Deluxe (Basic) v 2.8.5 or greater to use import Self-Assessment data files into <u>NeuroGuide</u> .			

Demo Mode

NeuroLink runs in Demo mode when the NeuroLink Security Key panel appears and after one has purchased NeuroLink assessments in the start up panel. Click the "Enter Demo Mode" button to enter the Demo mode. The Demo mode has a fixed self-assessment questionnaire and a fixed bar graph and radar map display. There also is a fixed session history panel with line graphs and a radar map. The Demo allows one to step through many of the functions of NeuroLink but without the ability to modify any of the controls.

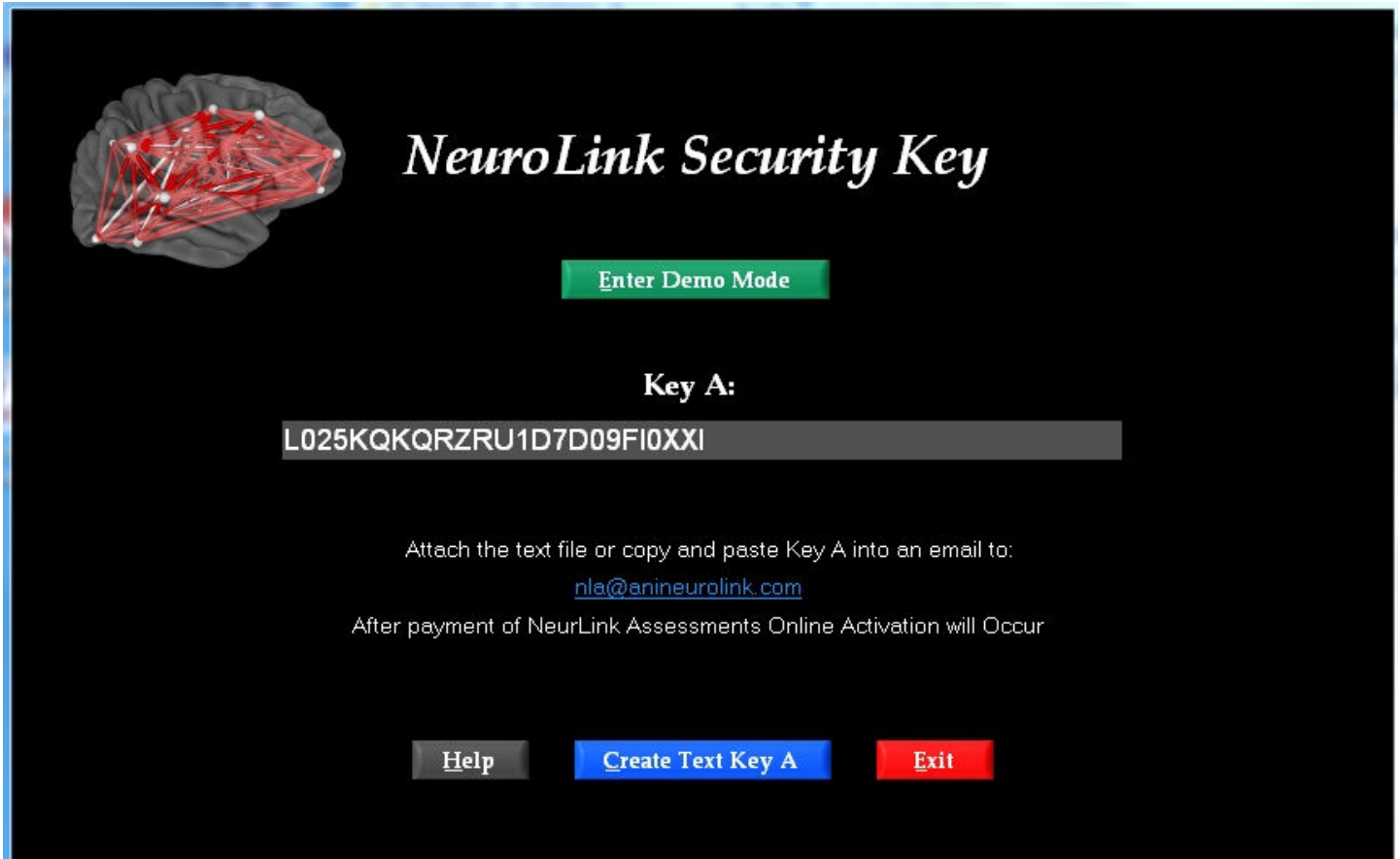
Only the NeuroLink Security Key panel will be displayed until one purchases a batch of NeuroLink assessments. Once the Key A is emailed to nla@anineurolink.com and a payment for assessments has occurred then the Key A of the computer that you are going to use to create symptom self-assessment data will be entered into the NeuroLink server database.

Once the user has activated NeuroLink on a computer for which the Key A was entered into the NeuroLink server database the NeuroLink security key panel will no longer be displayed.

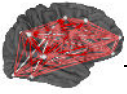


How to Activate NeuroLink:

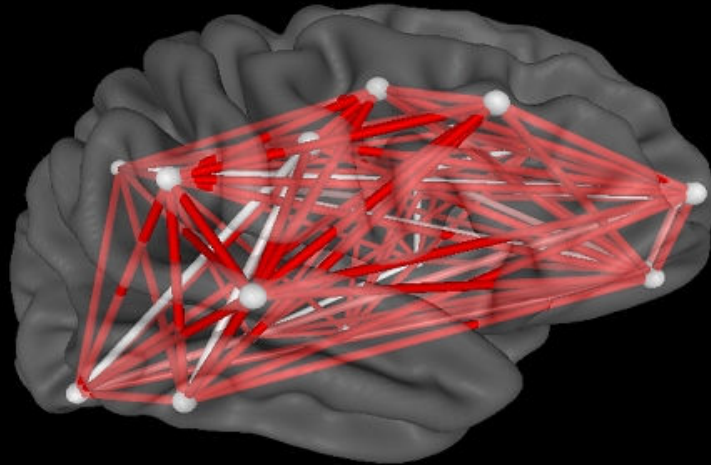
Launch NeuroLink and then either attach a key A text file or copy and paste the key A into an email to nla@anineurolink.com It will take up to 24 hours to register your computer on the NeuroLink server so please be patient. Below is an example of the screen that you will see:



If you have paid for NeuroLink then your key A will be registered on the server and within 24 hours the next time that you launch NeuroLink the splash screen below will appear and click any key to activate the



NeuroLink *by Applied Neuroscience, Inc*

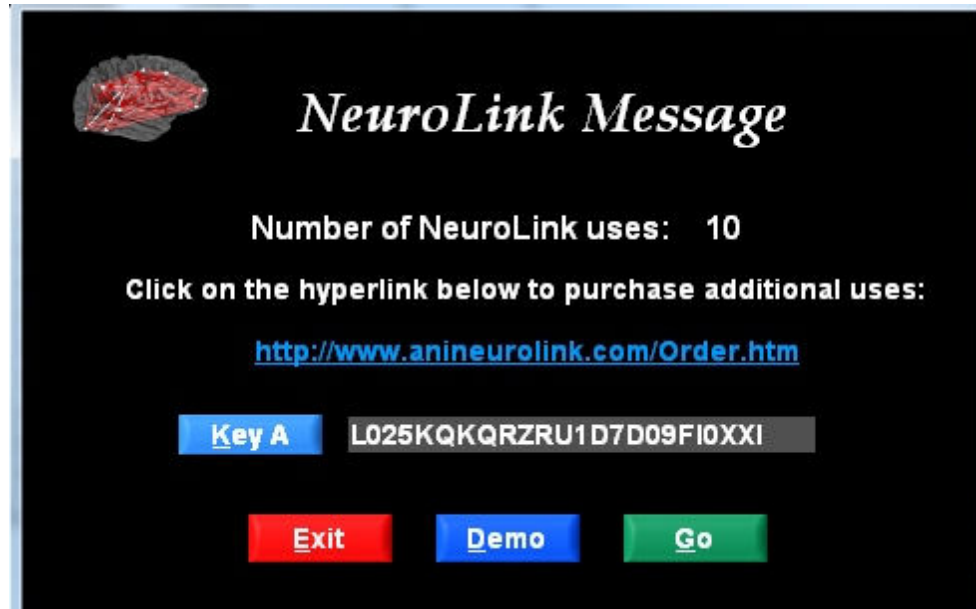
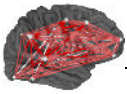


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Press Any Key to Continue...

Press any key and then a panel with the number of uses of NeuroLink will be displayed. This number will decrement only after the patient/client has completed filling out the Self-Assessment Symptom Check List and clicked OK. In order to assign different numbers of assessments to more than one computer you must email the key A for each computer and state how many assessments you want to assign to each computer. Click the Key A button and then copy and paste the key A into an email to nla@anineurolink.com



Click Go to activate the Patient Information panel

Support and Updates

Support is available Monday through Friday from 9 am to 5 pm EST.

You may contact us by email at support@anineurolink.com or by phone at 727-224-0240 or by going to our [Contact Us](#) page.

You will be notified via the email address you submitted on the download form about our FREE NeuroLink program updates.

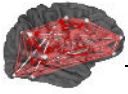
If you also purchase NeuroGuide, you will be invited to join the NeuroGuide users group at yahoo.com where open discussion is encouraged and NeuroGuide updates are announced, please join the group. To view the most recent NeuroGuide updates and the update history of NeuroGuide go to: <http://www.appliedneuroscience.com/whatsnew.htm>.

NeuroLink Help Manual and Tutorial

Part

Using NeuroLink

www.anineurolink.com

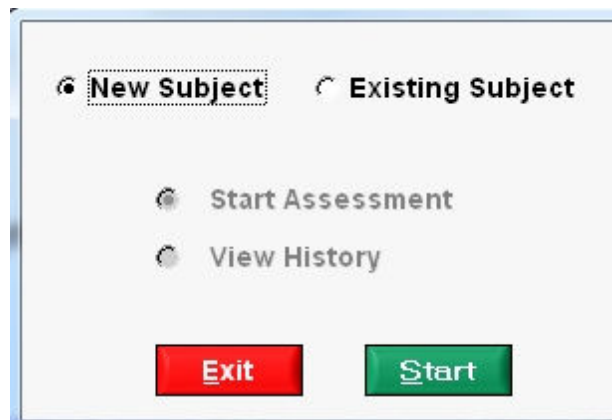


Using NeuroLink

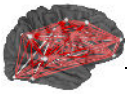
After purchasing the uses of NeuroLink and emailing the key A then a NeuroLink server will keep count of the uses and inform you of the number of uses in the NeuroLink message panel.

Click Go when you are ready to start a self-assessment session. The 1st panel will be a patient information panel that either you or the patient fills out. There are options to enter a new patient's information or to start another self-assessment for the same patient. There also is an option to view the history of self-assessments of symptoms.

Click Go in the NeuroLink message window to open the new vs existing patient panel. In this panel one can also select view history of previous symptom self-assessments had been taken.



Click Start to open the Patient Information Panel and fill out for a new patient. If this is an existing patient the the patient information will be automatically filled in.



Subject Information

First Name: Middle Initial:

Last Name:

Subject ID:

Date of Birth: Month Day Year

Gender: Male Female

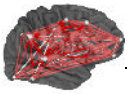
Handedness: Left Right Ambidextrous

Clinician:

Medication:

Click Next to open the Symptom Self-Assessment Questionnaire

After clicking next on the patient information panel an example of the symptom self-assessment questionnaire will appear as illustrated here:

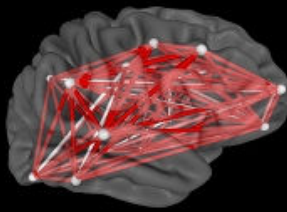
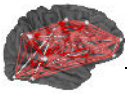


List of Subject's Symptoms or Complaints

For each Symptom and/or Complaint listed below, try and remember how you have felt over the past 1 to 4 weeks. Then slide the pointer on the scale directly below that Symptom/Complaint or click on the word to indicate how often you have experienced that Symptom/Complaint during that time. NOTE: Make sure that the sliding scale next to every Symptom/Complaint has some red color before clicking on the Next button.

I have cravings for alcohol or drugs	
I usually deny having any problems	
I am easily distracted	
People usually have to repeat words to me	
I have balance problems	

The patient/client must click on each and every question. An error message will appear if a question is not answered and the question will be colored in yellow to help find the unanswered question. Once all questions have been answered then click the next button to activate the clinician control panel. One does not want the patient/client to have access to other patient's information or folders on the clinician's computer and this is why the pause panel appears and requires the clinician's action to go forward from this point. The clinician must click the Ctrl-G keys to go to the next panel

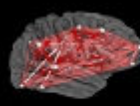


NeuroLink

You have finished all self assessment questions!

Please notify your clinician.

Click Ctrl & G keys and the warning panel below will appear:



NeuroLink Message

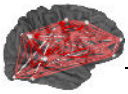
Number of NeuroLink uses: 10

Click on the hyperlink below to purchase additional uses:

<http://www.anineurolink.com/Order.htm>

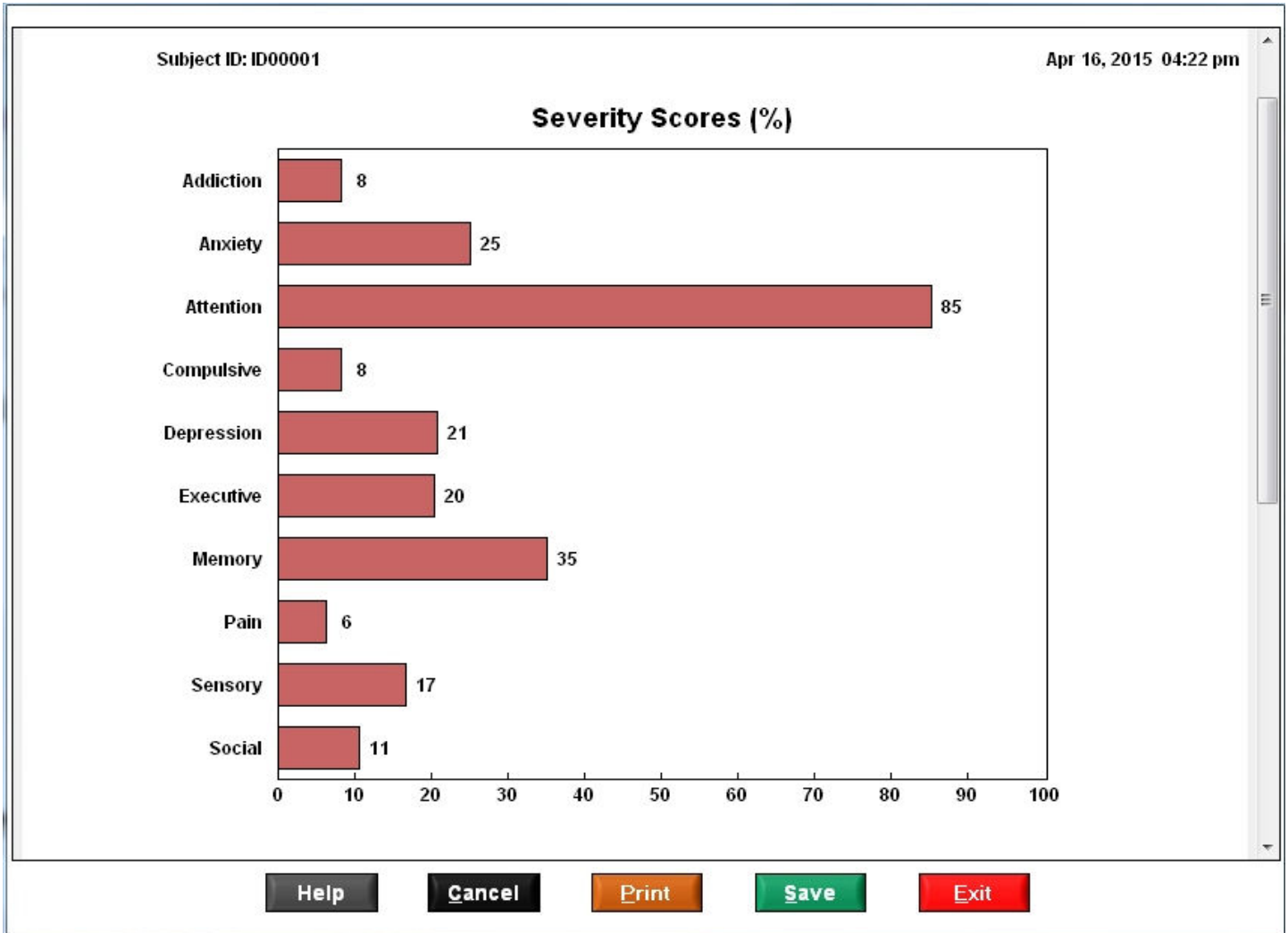
WARNING: Once you proceed then there will be a decrement in the number of Assessments

At this point a decrement in the number of self-assessments on the server will occur if the yes button is clicked. If you want to proceed and obtain the self-assessment charts and save the self-assessment data then one must click yes.

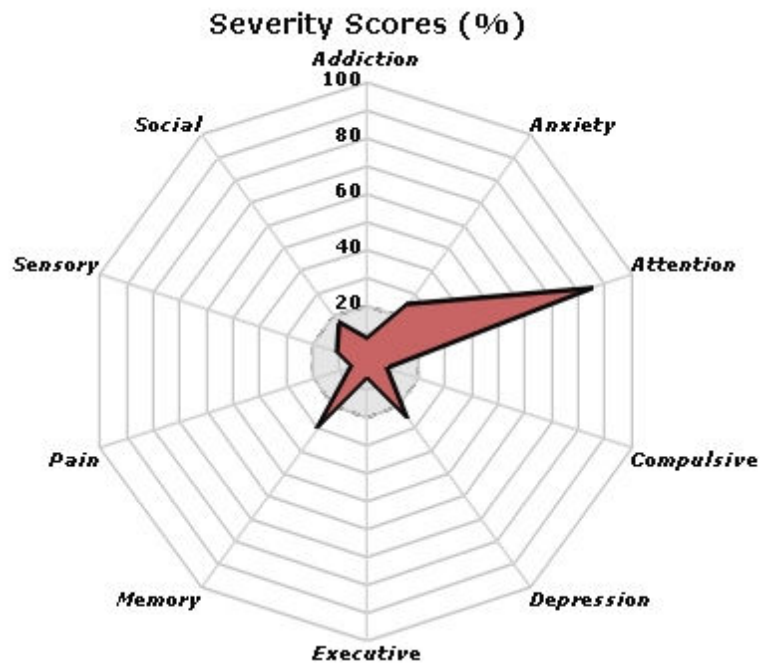
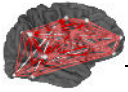


There are two symptom severity charts that appear after the patient/client has completed the symptom severity self-assessment. The first are horizontal bar graphs and the second is a radar map that summarize the ten symptom dimensions in the self-assessment questionnaire. These charts are calculated only after the clinician receives a warning that a NeuroLink assessment will be decremented on the NeuroLink server. Below are examples of the charts.

Horizontal Bar Graph

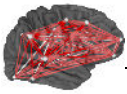


Radar Map



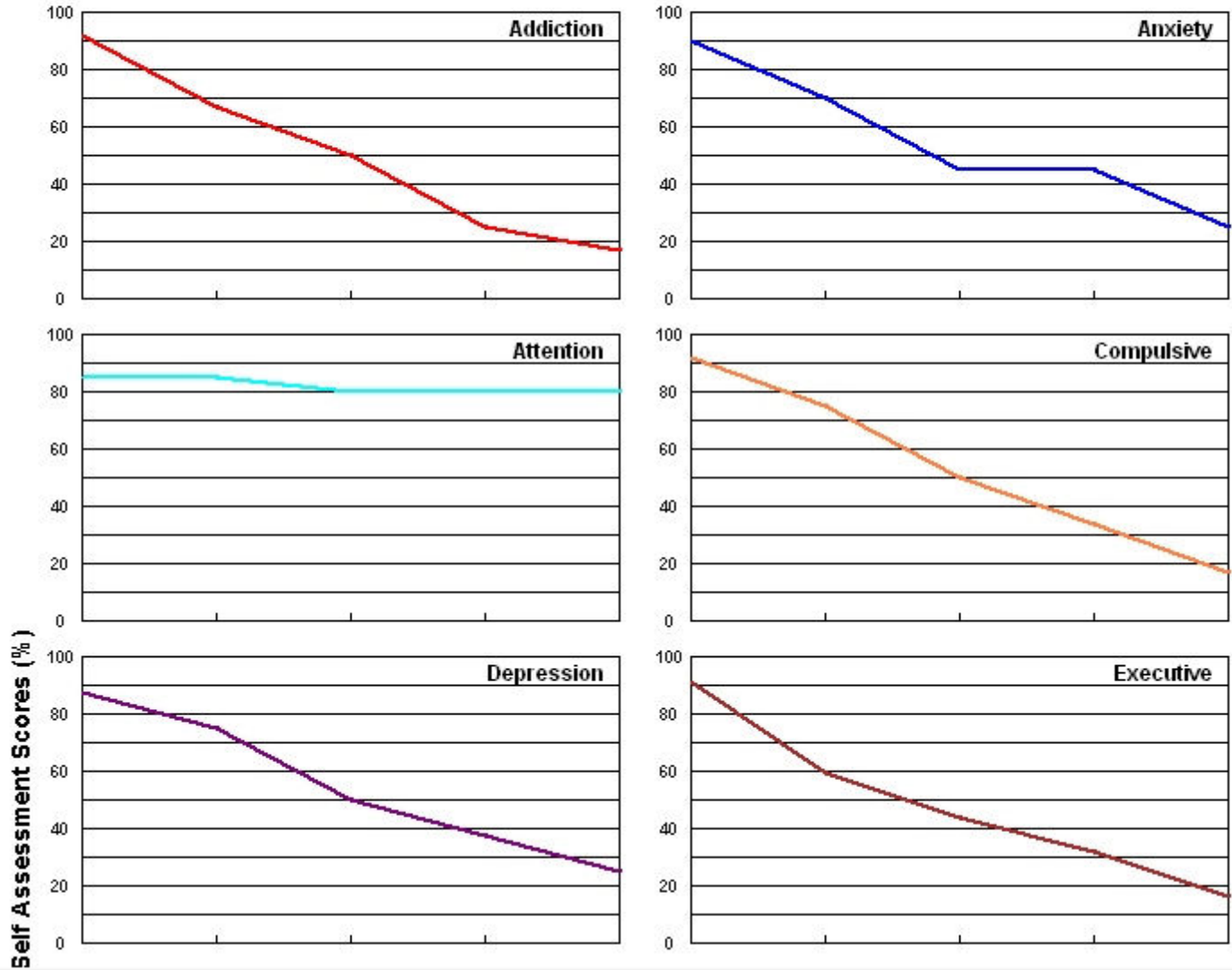
Click Save and navigate to the patient's folder to save the images as bitmaps and the *.nla binary session data to import into NeuroGuide. Click Print to print the charts.

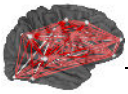
There are two charts of the history of symptom severity if one has selected New Patient and View History in the new vs existing patient panel. Navigate to the patient's folder where individual sessions have been saved. The sessions are saved by time of day and date. Click Done in the navigation panel to activate the Session History charts. The first chart are line graphs with sessions on the x-axis and symptom severity on the y-axis. The 10 dimensions of the Radar Maps are the 10 symptom categories and the distance from the center of the radar map is the percent severity of symptoms. Below are examples of the session history charts.



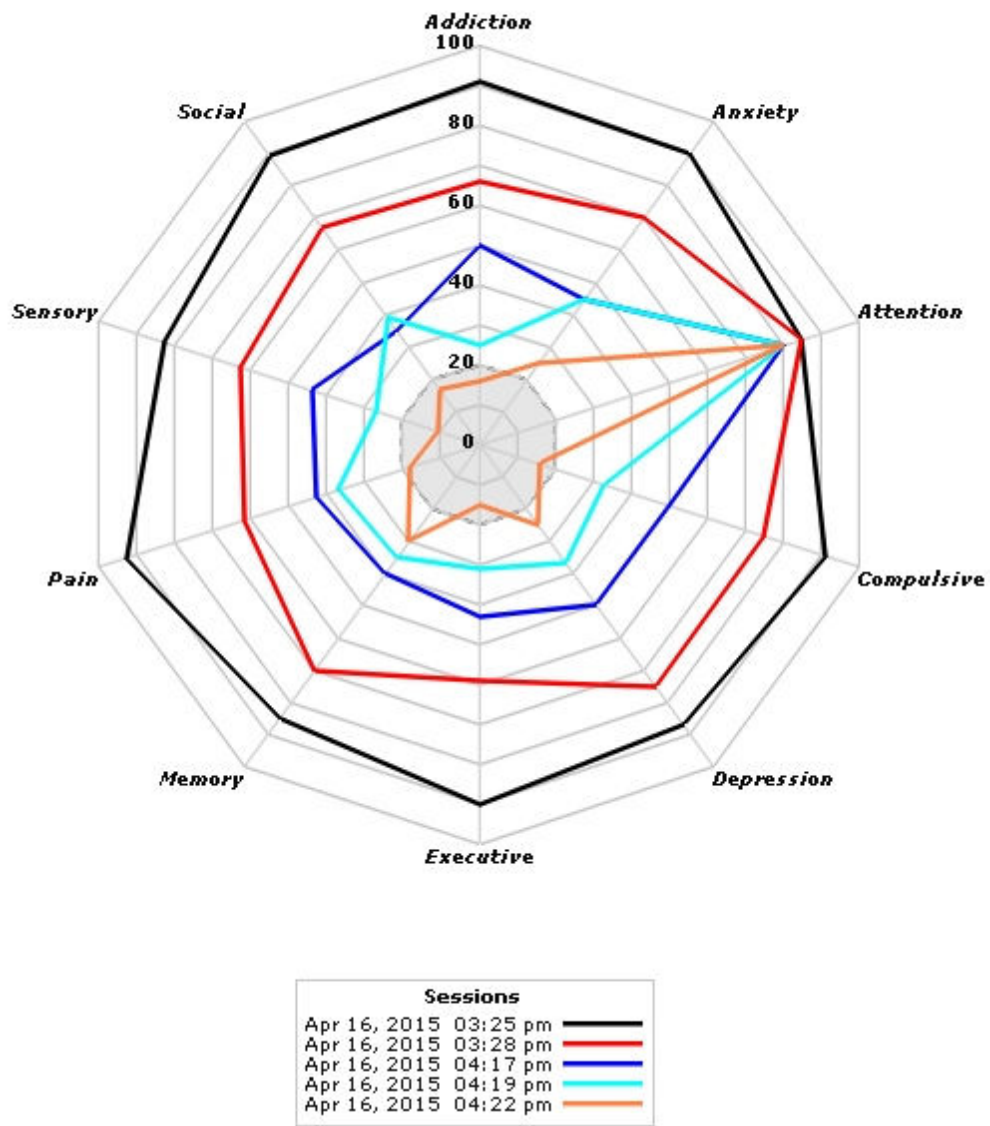
Subject ID: ID00001

Session History

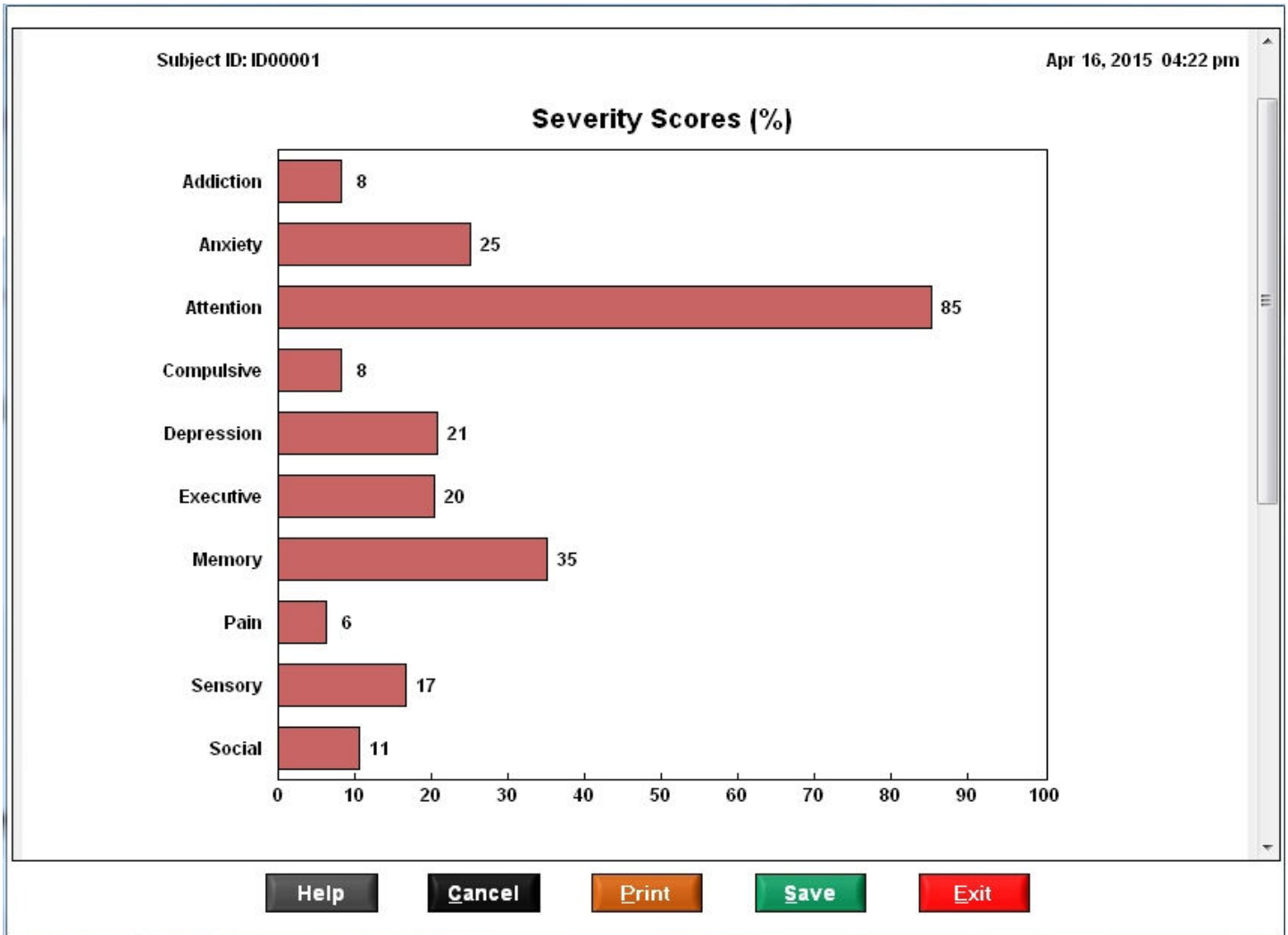
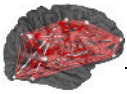




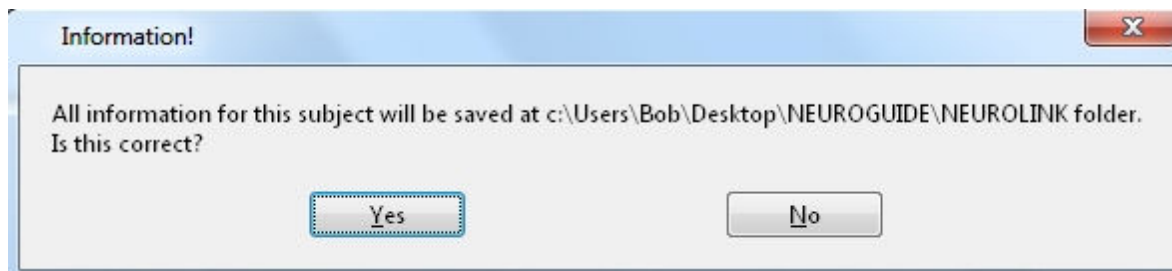
Session History of Severity Scores (%)



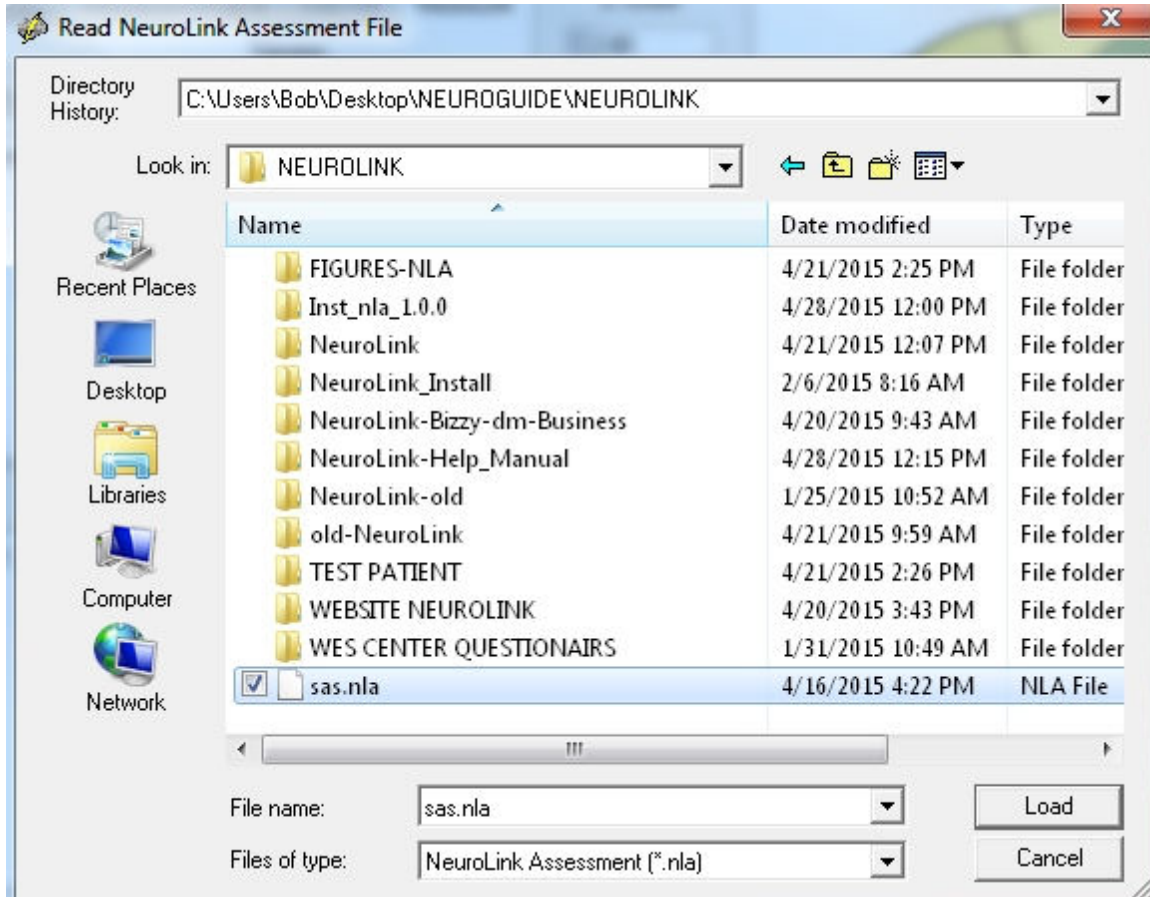
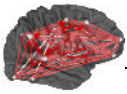
In the session symptom severity chart panel, click the **Save Button** and navigate to the patient's folder and save the bitmaps and the binary *.nla file that can be imported into NeuroGuide. The files have time and day stamps so that the history of sessions is ordered by date. Similarly, when the *.nla file is imported into the NeuroGuide symptom check list the order of sessions can be selected.



The message below will be displayed to give the user a chance to change the folder where the data will be saved. This is because it is important to always save the session data in the correct patient's folder.



Example of the Windows navigation panel when when saves the symptom severity data. NeuroLink retains a memory of the last location where data was saved. Be sure to navigate to the patient's folder each time you save the NeuroLink data.

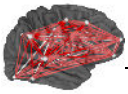


NeuroLink Help Manual and Tutorial

Part

Using NeuroGuide

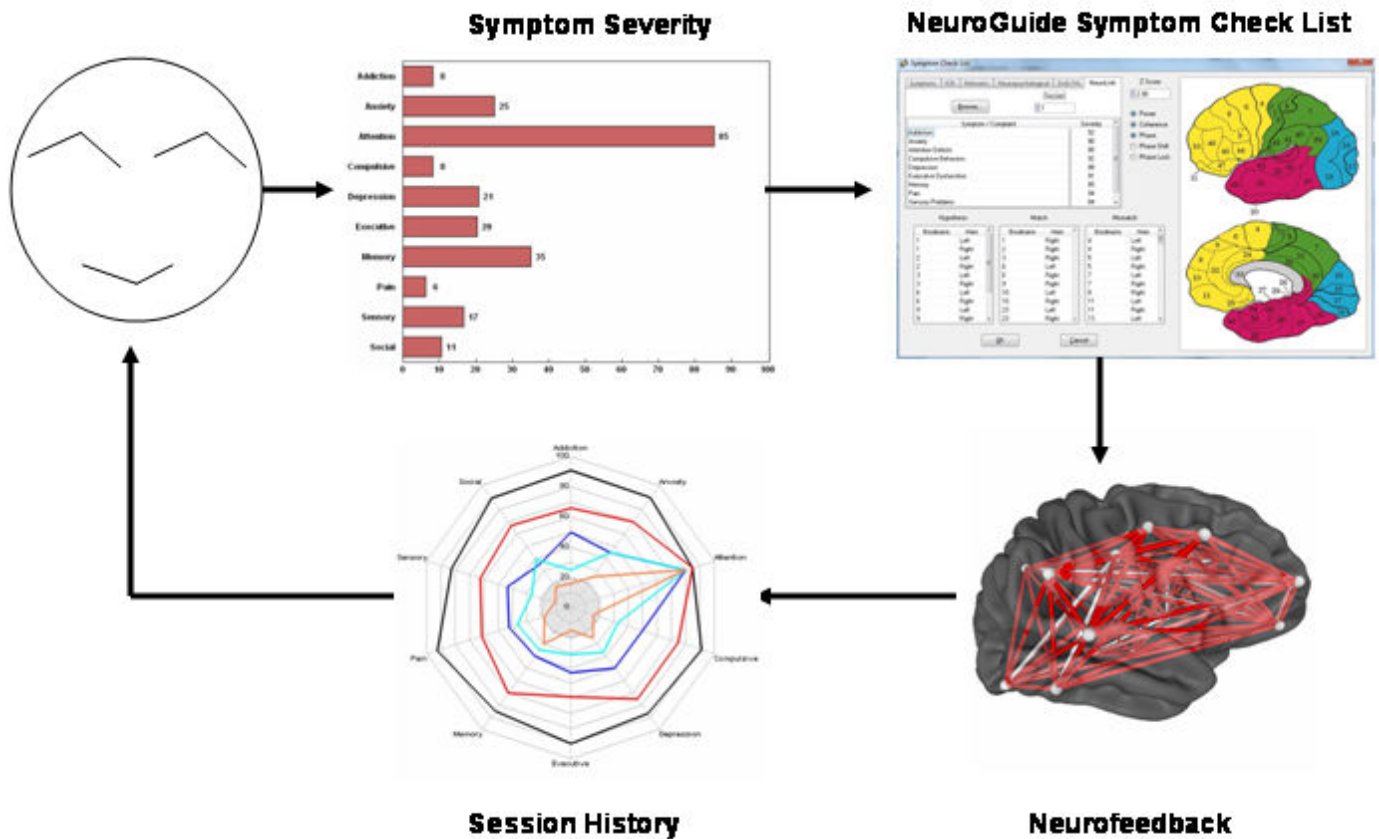
www.anineurolink.com



Using NeuroGuide

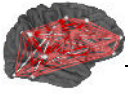
The purpose of NeuroLink is increased efficiency, reduced time for assessment and increased accuracy of linking symptoms to the patient's brain. The goal is to facilitate the assessment of symptom severity and then to import the severity index into NeuroGuide in order to design a Neurofeedback protocol targeted to the dysregulated network nodes and connections linked to the patient's symptoms. Another goal of NeuroLink is to efficiently compare changes in symptoms over sessions of treatment and give feedback to the clinician to adjust the Neurofeedback protocol. The figure below emphasizes the seamless integration between NeuroLink and NeuroGuide

NeuroLink and NeuroGuide Integration – Linking Symptoms to the Brain



The steps are:

- 1- self-assessment of symptom severity,
- 2- Import NeuroLink symptom index into NeuroGuide's Symptom Check List panel,
- 3- Select the most troublesome symptom and automatically link to Brodmann area currents and connections between Brodmann areas by coherence and phase,
- 4- Start Neurofeedback targeting the most dysregulated networks linked to symptoms and



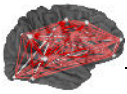
5- Repeat NeuroLink symptom self-assessment before the next treatment and evaluate the progress of treatment over sessions.

As mentioned previously, the goal of NeuroLink is to facilitate identification of the most troublesome symptoms and immediately link the symptoms to the electrical energies of the brain (i.e., EEG) in dysregulated nodes and connections related to the symptoms. Once the linkage is made then a Neurofeedback protocol is automatically created and Neurofeedback can immediately begin that targets the relevant nodes and connections.

Launch NeuroGuide, click Collection > Setup & Monitor and OK and then click Collection > Neurofeedback and select Surface Neurofeedback or LORETA Neurofeedback or BrainSurfer. These different methods of Neurofeedback all share similar setup panels and therefore not all will be shown here. It is best to consult the NeuroGuide Manual and use the NeuroGuide Demo to learn how to use NeuroGuide to do Neurofeedback. Here is a url to the Applied Neuroscience, Inc. website where one can download the Neuroguide Demo as well as the NeuroGuide Manual: www.appliedneuroscience.com

Here is a website with 12 free Webinar videos in how to use Neuroguide and how to perform Neurofeedback: www.appliedneuroscience.com/Webinars.htm

Below is an example of the NeuroGuide symptom check list panel inside of the LORETA Neurofeedback module. One must 1st record the patient's EEG and select artifact free EEG data with high test re-test reliability and click Report > Create Symptom Check List Match and save the .scl file in the patient's folder. This file must be retrieved in order to open the panel below and is used to match the most dysregulated nodes and connections in brain networks linked to the patient's symptoms. Details on how to use NeuroGuide are explained in the hyperlinks above



Symptom Check List

Symptoms | ICN | Networks | Neuropsychological | DoD/VA | **NeuroLink**

Session:

Symptom / Complaint	Severity
Addiction	0
Anxiety	0
Attention Deficits	0
Compulsive Behaviors	0
Depression	0
Executive Dysfunction	0
Memory	0
Pain	0
Sensory Problems	0

Z Score:

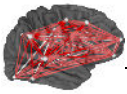
- Power
- Coherence
- Phase
- Phase Shift
- Phase Lock

Hypothesis | Match | Mismatch

Brodmann	Hem	Brodmann	Hem	Brodmann	Hem
				1	Right
				2	Right
				3	Right
				4	Left
				4	Right
				5	Left
				5	Right
				6	Left
				6	Right
				7	Left

Click the NeuroLink tab and then click the Browse button and navigate to the patient's folder where the *.nla symptom severity files were saved by using NeuroLink. Click the done button and all of the NeuroLink session data will be loaded into NeuroGuide. Click the session drop down menu and select the session that you want to base the Neurofeedback session on.

Once the *.nla NeuroLink sessions have been loaded into the NeuroGuide symptom check list panel under the NeuroLink tab then select a session to create a Neurofeedback protocol linking symptoms to the patient's brain. Below is an example where session #1 was selected and the 10 symptom categories are displayed showing the percent severity of each symptoms. In this case, Addiction was selected.



Symptom Check List

Symptoms | ICN | Networks | Neuropsychological | DoD/VA | NeuroLink

Session: 1

Z Score: 2.00

- Power
- Coherence
- Phase
- Phase Shift
- Phase Lock

Symptom / Complaint	Severity
Addiction	92
Anxiety	90
Attention Deficits	85
Compulsive Behaviors	92
Depression	88
Executive Dysfunction	91
Memory	85
Pain	94
Sensory Problems	84

Hypothesis		Match		Mismatch	
Brodmann	Hem	Brodmann	Hem	Brodmann	Hem
1	Left	1	Right	4	Left
1	Right	2	Right	4	Right
2	Left	3	Right	5	Left
2	Right	6	Left	5	Right
3	Left	6	Right	7	Left
3	Right	9	Right	7	Right
6	Left	10	Left	8	Right
6	Right	10	Right	11	Left
9	Left	23	Left	11	Right
9	Right	23	Right	13	Left

OK Cancel

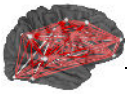
The Hypothesis list is based on the fMRI and PET scientific literature related to the addiction network. For more details about this and all of the networks inside of NeuroGuide do a Google search or search Pubmed for the networks known to be related to these symptoms. Another source is the Handbook of QEEG and EEG Biofeedback that is in hard copy and ebook form at: www.anipublishing.com

The Match panel are deviant from normal Z score EEG measures that match the network Brodmann areas listed under Hypothesis. These are the measures that form the Neurofeedback protocol and constitute parts of the "weak" system related to the patient's symptoms. The goal is to reinforce toward Z = 0 which is the center of a healthy reference population of age matched subjects and to reinforce increased stability and efficiency in the nodes of the network related to the patient's symptoms.

The Mismatch panel are considered likely "Compensatory" nodes that are not targeted for Neurofeedback.

Adjust the Z score value in the upper part of the panel to higher values and identify the most deviant Brodmann areas. Click OK to open the NeuroGuide protocol panel to begin Neurofeedback.

When one clicks OK in the symptom check list panel then the Protocol panel opens that shows the total number of metrics and the Brodmann areas linked to the patient's symptoms that are automatically selected.



LORETA Neurofeedback

Protocol: Session Rounds Progress

Metric:

- Power
- Coherence
- Phase
- Phase Shift
- Phase Lock

Frequency:

- D A1
- T A2
- A B1
- B B2
- HB B3

Region of Interest:

- Amygdala Left
- Amygdala Right
- Angular Gyrus Left
- Angular Gyrus Right
- Anterior Cingulate Left
- Anterior Cingulate Right
- Cingulate Gyrus Left
- Cingulate Gyrus Right
- Cuneus Left
- Cuneus Right
- Extra-Nuclear Left
- Extra-Nuclear Right
- Fusiform Gyrus Left
- Fusiform Gyrus Right
- Hippocampus Left
- Hippocampus Right
- Inferior Frontal Gyrus Left
- Inferior Frontal Gyrus Right

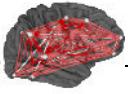
Z Threshold: 1.00 Metrics Selected: 178 Window: 0.25 sec Display: Cz Head

Monitor: 1 Method: Z-Tunes Sound: Off

Brodmann Area Table:

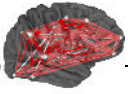
<input type="checkbox"/>	1	Left						
<input checked="" type="checkbox"/>	1	Right	D	T	A	A1		
<input type="checkbox"/>	2	Left						
<input checked="" type="checkbox"/>	2	Right	D	T	A	B	A1	B1
<input type="checkbox"/>	3	Left						
<input checked="" type="checkbox"/>	3	Right	D	T	A	A1		
<input type="checkbox"/>	4	Left						
<input type="checkbox"/>	4	Right						
<input type="checkbox"/>	5	Left						
<input type="checkbox"/>	5	Right						
<input checked="" type="checkbox"/>	6	Left	D	T				
<input checked="" type="checkbox"/>	6	Right	D	T	A	A1		
<input type="checkbox"/>	7	Left						
<input type="checkbox"/>	7	Right						
<input type="checkbox"/>	8	Left						
<input type="checkbox"/>	8	Right						
<input type="checkbox"/>	9	Left						
<input checked="" type="checkbox"/>	9	Right	D	T	A	A1		
<input checked="" type="checkbox"/>	10	Left	D	T				
<input checked="" type="checkbox"/>	10	Right	D	T	A	A1		
<input type="checkbox"/>	11	Left						
<input type="checkbox"/>	11	Right						
<input type="checkbox"/>	13	Left						
<input type="checkbox"/>	13	Right						
<input type="checkbox"/>	17	Left						
<input type="checkbox"/>	17	Right						
<input type="checkbox"/>	18	Left						

When ready, click **Apply** and **Begin Session** to start the Neurofeedback session that targets dysregulated nodes and connections linked to the patient's symptoms. As mentioned, details of how to use Surface, LORETA and BrainSurfer Neurofeedback are inside of the NeuroGuide Manual and are explained in Webinars at: www.appliedneuroscience.com/Webinars.htm



All Comments and Feedback Are Welcome

To Tell Us What You Think
Contact: info@anineurolink.com



Index

- * -

*.nla binary session data 24

- 1 -

10 symptom categories 34

- A -

Adjust the Z score value 34

Applied Neuroscience, Inc 33

- B -

Bar Graph 6

binary *.nla file 27

bootcamp mode 13

BrainSurfer 33

Brodmann areas linked 35

Browse button 33

browse to the patient's folder 6

- C -

Charts of Symptom History 25

Charts of Symptom Severity 24

Click Done in the navigation panel 25

Compensatory 34

connections in brain networks 33

Create Symptom Check List Match 33

Ctrl-G 21

- D -

Demo Mode 15

dysregulated nodes 33

- E -

Enter topic text here. 6

error message 21

- H -

history plots 6

Horizontal Bar Graph 24

How to Install NeuroLink 13

Hypothesis list 34

- I -

import into NeuroGuide 24

imported into NeuroGuide 27

integration between NeuroLink and NeuroGuide 32

- K -

Key A is emailed 15

- L -

Launch NeuroGuide 33

line graphs 25

LORETA Neurofeedback 33

- M -

Match panel 34

Microsoft Windows 13

Mismatch panel 34

- N -

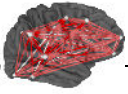
navigate to the patient's folder 27

networks linked to the patient's symptoms 33

NeuroGuide 32

NeuroGuide Demo 33

NeuroGuide Manual 33



NeuroGuide symptom check list 6, 27
NeuroGuide symptom check list panel 33
NeuroLink Security Key panel 15
NeuroLink server database 15
NeuroLink tab 33
New Patient 25

- P -

Patient Information 20
Patient Information Panel 16, 20
patient/client 16
percent severity of symptoms 25
Protocol panel 35

- Q -

questionnaire 21

- R -

Radar Map 6, 24
Radar Maps 25

- S -

Save Button 27
save the bitmaps 27
save the images as bitmaps 24
Self-Assessment *.nla 6
self-assessment questionnaire 21
Self-Assessment Symptom Check List 6
session history charts 25
Surface Neurofeedback 33
Symptom History 6
Symptom Self-Assessment Questionnaire 20

- U -

Using NeuroGuide 32

- V -

View History 25

- W -

weak 34
Webinar videos 33
Windows navigation panel 27

Back Cover