

# *LONGITUDINAL STUDIES of Neurofeedback Efficacy*

Victoria L. Ibric, MD, PhD, BCAIC  
Neurofeedback & NeuroRehab Institute, Inc

[www.nnrionline.com](http://www.nnrionline.com)

## Abstract.

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- | Allopathic approaches to illness caused by Traumatic Brain Injury (TBI) of mechanical or chemical nature may be very helpful, but not necessarily sufficient in permanently eliminating symptoms. Neurofeedback (NF) is a rehabilitation technique that must be used as well.
- | Based on the Neuro-modulation process induced by NF, and the neuroplasticity of the nervous system, brain injured individuals benefit and their recovery continues long after the NF training is completed.

# Introduction.

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- In my 14 years experience using NF with more than 120 patients who suffered from TBI, I observed that when NF was planned and sufficiently practiced, permanent changes and sometimes complete cessation of symptoms were produced.
- This paper presents 2 patients who suffered various types of TBI and were treated with NF and followed over time.
- The results of the NF training was remarkable with complete cessation of symptoms such depression, epilepsy, chronic pain, and addictions are reported here.
- These results were sustained over time after the NF training was completed, up to 2-6 years after the NF training was completed.

## Methods.

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- | The two case studies presented are:
- | 1) First case overcame the symptoms of 30 years allopathically treated bipolar depression and subsequent addictions.
- | 2) Second case survived a Motor Vehicle Injury with epilepsy, hemiplegia, depression, sleep disorder and speech/ cognitive dysfunctions, as post TBI symptoms.

## Methods & Instruments.

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- Standard evaluations and re-evaluations were performed and consisted of:
  - 1) medical history intake questionnaire
  - 2) cognitive testing (TOVA replaced by IVA)
  - 3) Stress tests, depression (CES-D), pain scale (VAS)
  - 4) Brain wave evaluations over sensory motor area
  - 5) QEEGs

## Case 1 Housewife, Age 42 to 52

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- | Diagnosed with Bipolar Disorder at age 12
- | Addictions for 30 years
- | Suicidal tendencies
- | Severe weight gain, post Lithium
- | Therapy pre-NF:
- | Multiple antidepressants plus self administered psychoactive drugs
- | NF training over 7 years
  - 191 sessions :
    - 68 Neurocybernetics
    - 123 ROSHI

# Case 1 - protocols

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## ■ Neurocybernetics:

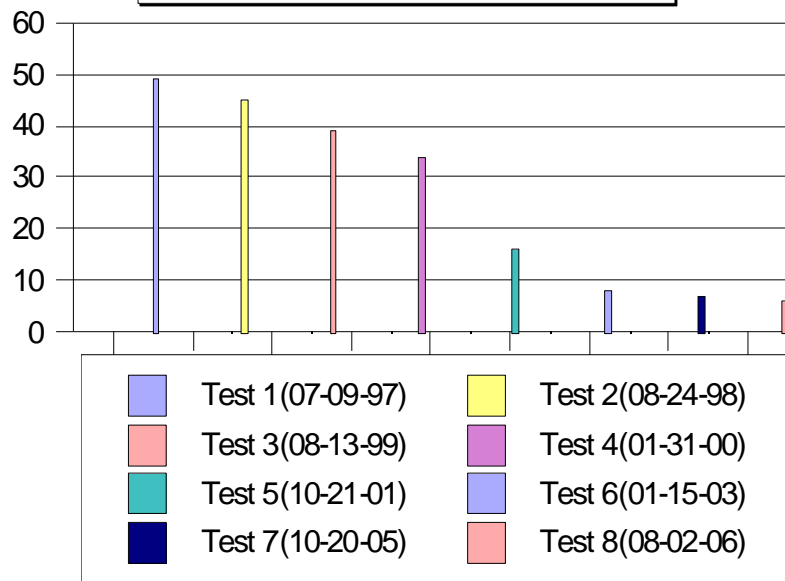
- C3 Beta or
- C4 SMR, as needed for depression or anxiety, accordingly

## ■ ROSHI:

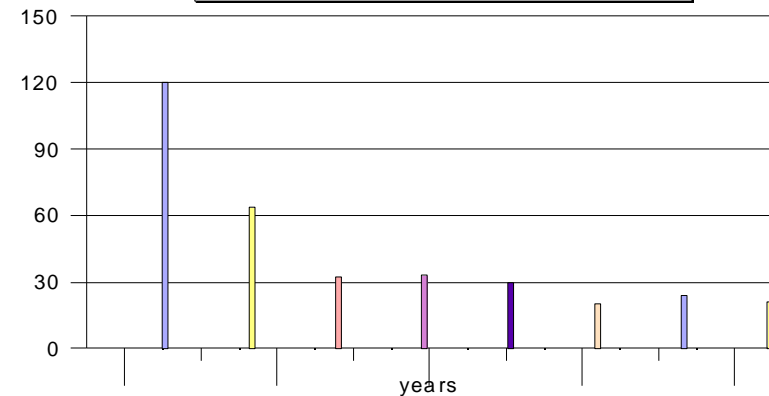
- NF enhanced with light closed loop EEG (white or red light)
  - F3/F4 Beta (B16), or B17 enhance
  - F7/F8 AO[I]
  - P3/P4 AO[E]

# Case 1 Depression & Stress tests

Case 1 Depression test over the years



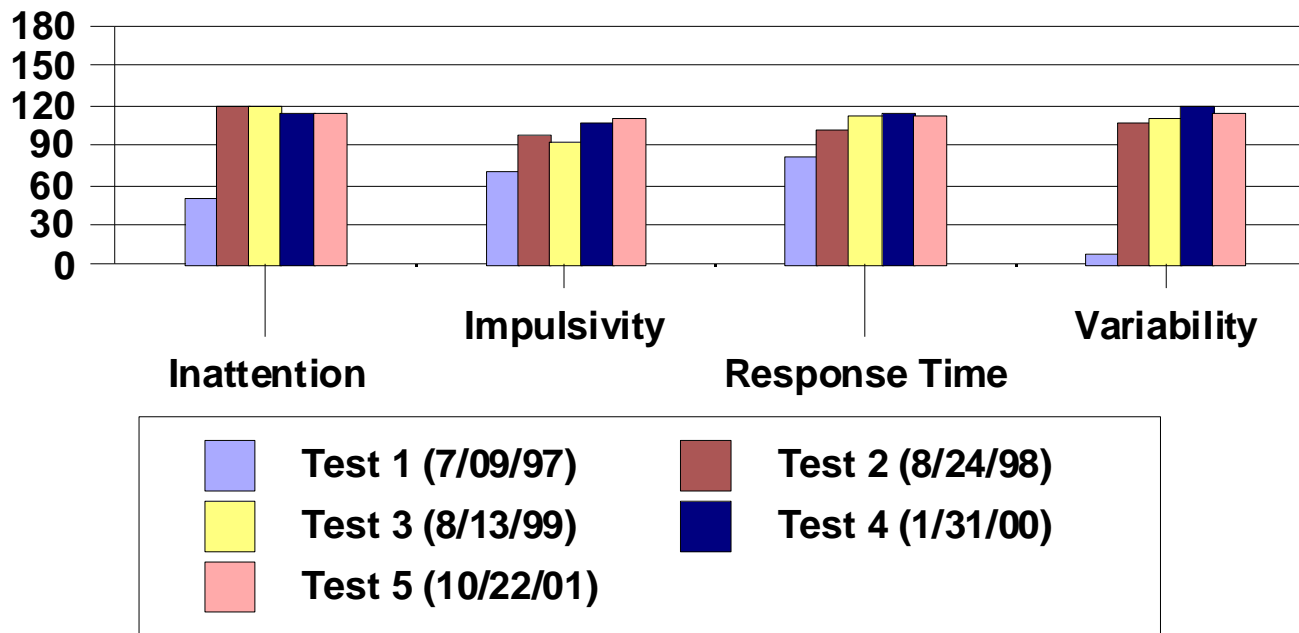
Case 1 Stress tests over the years





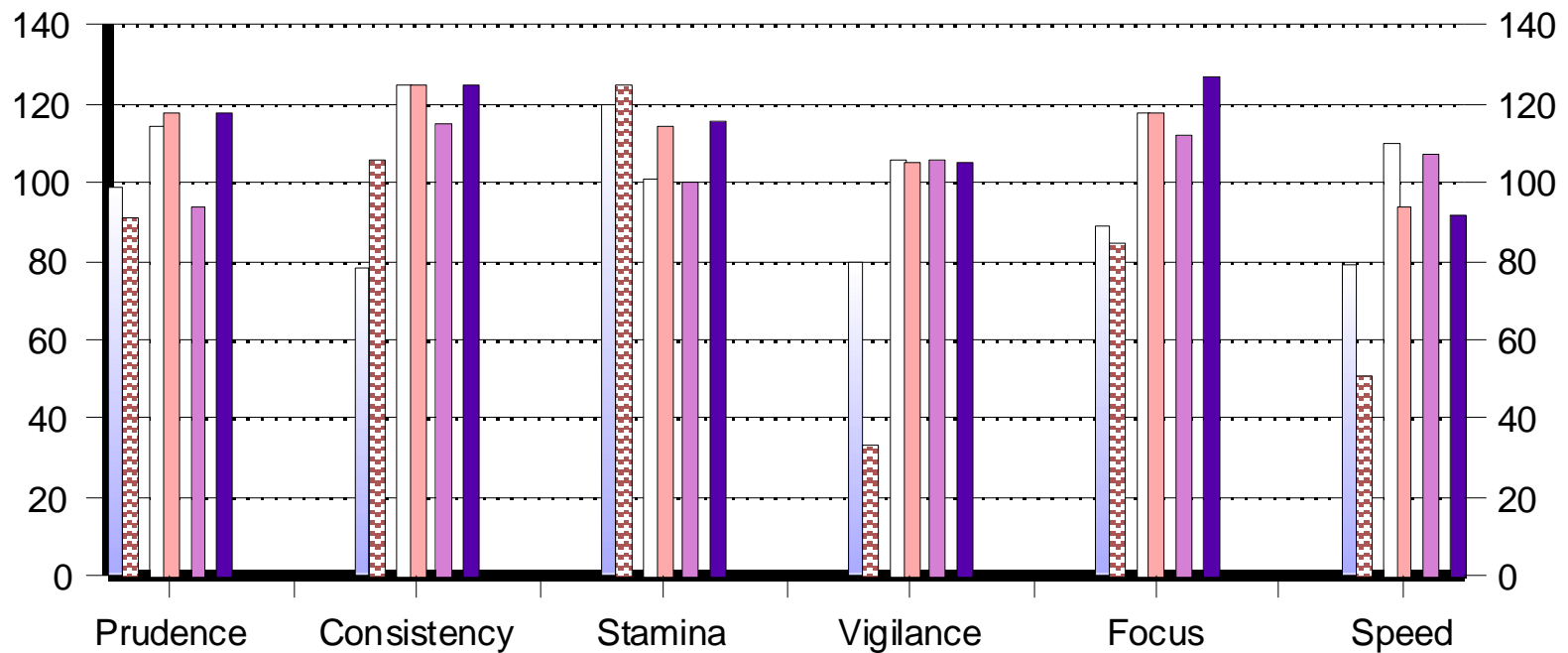
# Case 1 Cognitive tests

## T.O.V.A. Scores



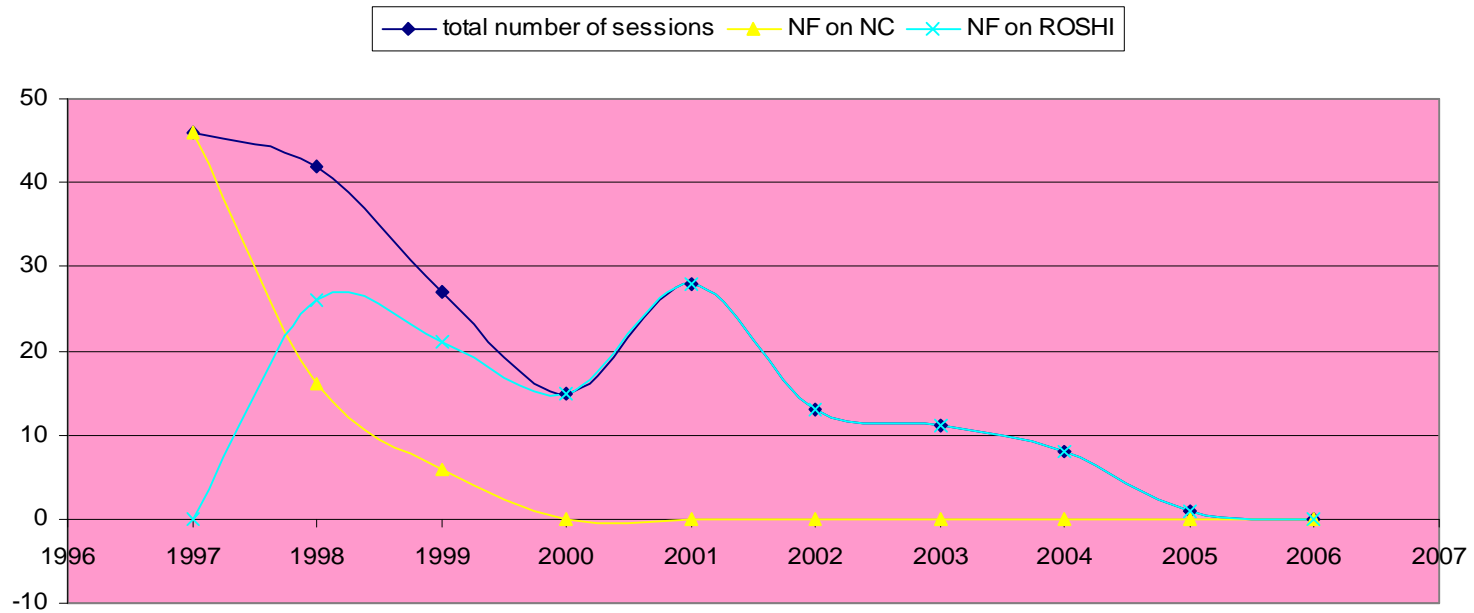
# Case 1 Cognitive tests

IVA Tests, 5-31-2002/ 10-20-2005/ 08-02-06



# Case 1 Number of NF sessions over time

Case 1 NF sessions over the years



## Case 1 Discussion

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- The medications prescribed exacerbated her conditions.
- She responded well to traditional Neurofeedback treatment. However she reached a plateau in her recovery.
- She responded with a vigorous and complete remission in response to the ROSHI treatment.
- She was able to come off all medications within her first year and remained drug free since.
- She was able to maintain the improved state and was able to be weaned from once a week to once a month, to less than 8 times a year, down to less than once a year.

## Case 1 Conclusion

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- | She has not only regained her ability to function in a normal fashion in terms of her daily living activities, but in addition, has found in herself the creative potential to use the experiences from her illness to help others suffering from similar problems.
- | The patient's improvement has continued for over nine and a half years at this time. An individual who was completely immobilized with depression and chemical dependency is now functioning in a greatly improved fashion in the wider social world, as well as at home.
- | See her compelling story in the chapter 9<sup>th</sup> of the book "Healing depression and bipolar disorder without drugs" by Gracelyn Guyol, published 2006

## Case 2- student translator age 27-35

Diagnosed:

MTBI, post MVA with  
3 month coma

### SYMPTOMS

- Left side Hemiplegia
- Aphasia, stuttering
- Seizure disorder
- Depression
- Memory impairment

### Therapies pre-NF

Medications:

- Tegretol, 200 mg bid
- Dilantin, 300 mg
- Celexa
- Serozone
- Zoloft
- Folic acid 3 mg

Physical therapy, OT, Speech Therapy, Acupuncture

## Case 2 - Protocols

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- | NC Protocols:

- | Cz SMR

- | C4 SMR

- | C3 beta

- | ROSHI Protocols:

- | using white light/  
open + EM

- | C1/C2 SMR or TO[I]

- | C3/C4 SMR

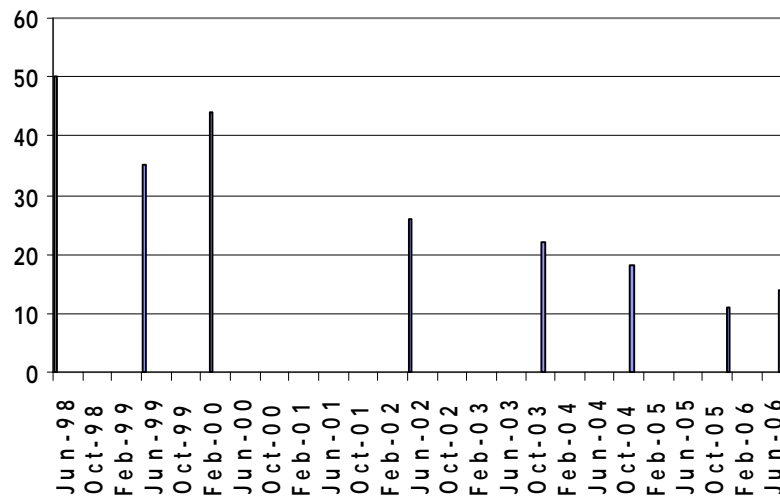
- | Cz/C4 SMR or TO[I]

- | F3/F4 TO[I]

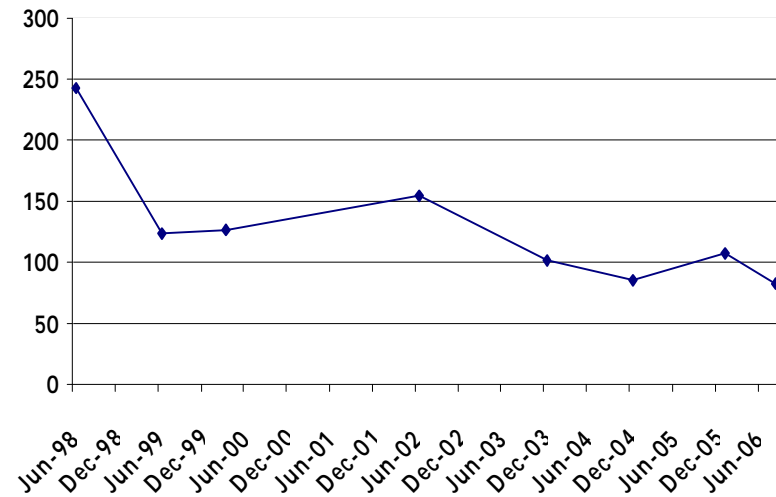
- | Cz/F4 TO[I]

# Case 2 Depression & Stress tests

Case 2 Depression scale



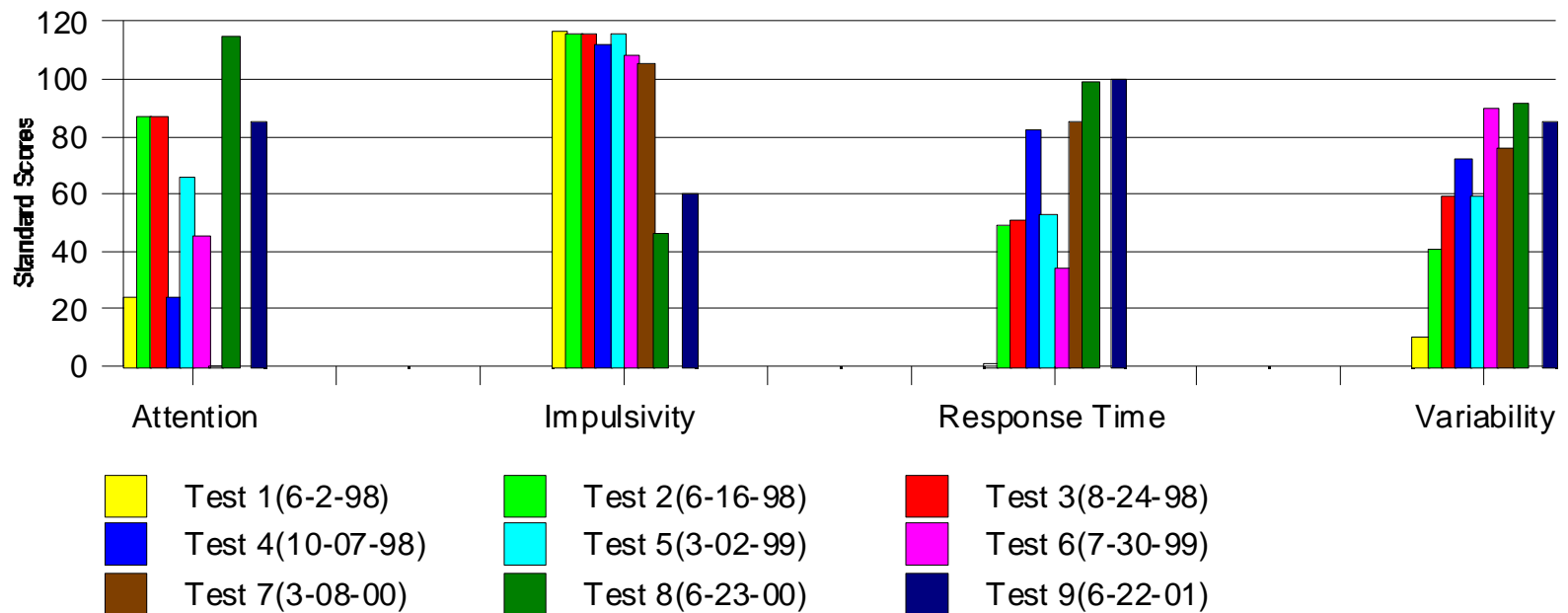
Case 2- SCL-90R





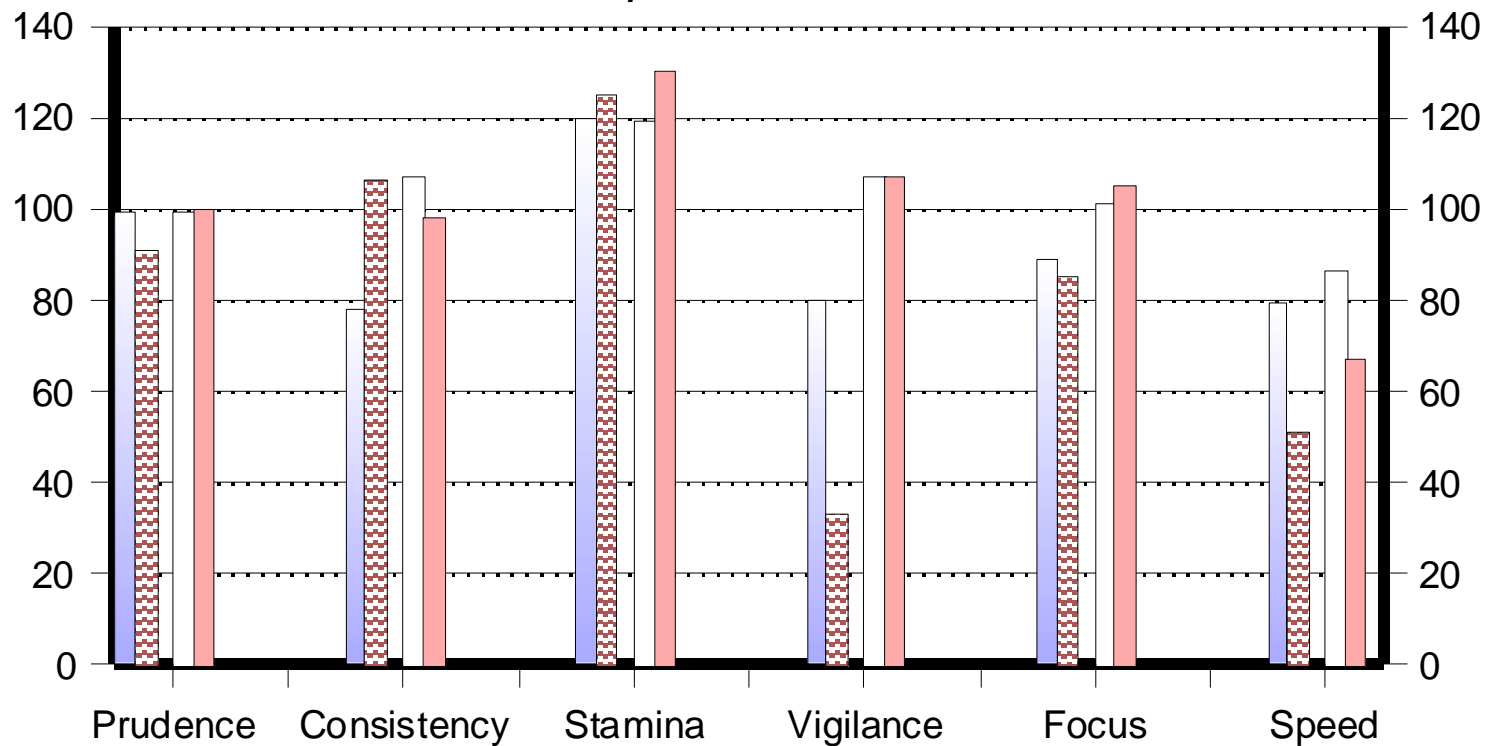
# Case 2 Cognitive tests

## T.O.V.A. Results

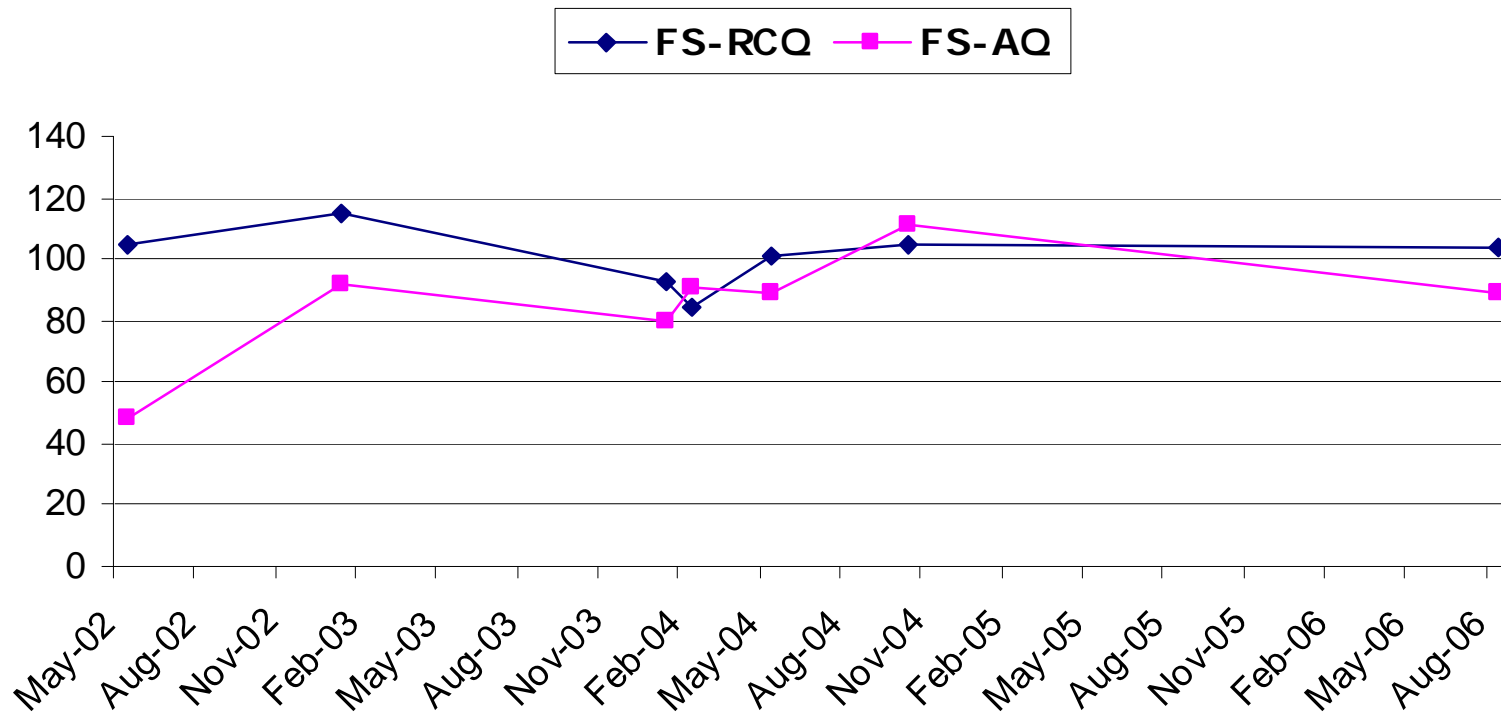


# Case 2 Cognitive tests

Case 2 IVA test, 5-31-2002 vs 1-17-2003

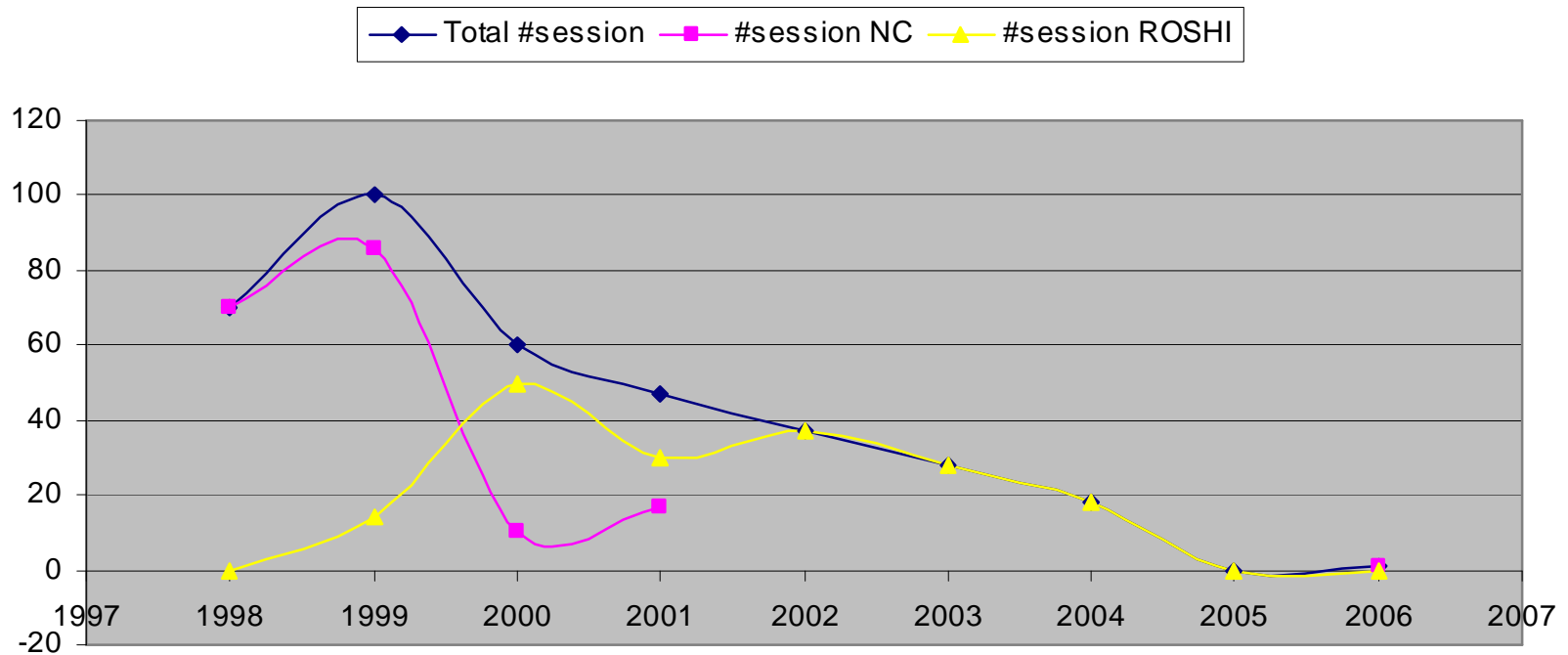


# Case 2 Cognitive tests



# Case 2 Number of NF sessions over time

Case 2 NF sessions over the years



## Case 2 Discussion

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- At the end of NF:
- Walks with only a slight limp, left foot getting stronger
- Regaining the use of his left hand
- Has regained sensation on the previously paralyzed limbs
- Speech is normal
- Finished one school with GPA 4.0, getting ready to start another school!
- No seizures for 5 years;
- Meds reduced to Dilantin only!
- He is living on his own
- He continues to learn French without difficulty
- He has enjoyed driving for almost 2 years now!

## Case 2 Conclusion

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- The patient's improvement continued for over 8 and a half years at this time.
- A highly functioning individual who, due to a TBI, was incapacitated by seizures depression, physical as well as cognitive impairments.
- Due to the added benefits of the NF training, he has regained his zest for life and he is performing in an improved fashion in his social world.

## Results and Discussion.

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- | The progress of these two cases were evaluated and re-evaluated during the course of the NF training, which was modified accordingly. These two patients stopped NF after completing sufficient numbers of NF sessions (60-360 sessions per training interval).
- | Subjective and objective evaluations collected after years are perfect proof.
- | Other colleagues and I have reported additional positive results in using NF in post TBI syndromes (Ayers, Beyers), epilepsy (Serman), depression (Baehr & Rosenfeld, Hammond) and chronic pain (Rosenfeld et al, & Ibric)
- | This paper presents the power of the NF training in very complicated cases. and shows conclusively that, if the training is planned and performed sufficiently, long lived positive changes can be expected.

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