WHERE DO WE GO FROM HERE? FUTURE OF NEUROPSYCHOLOGY SERVICES

NAN 2018

Ronald M. Ruff

Financial Disclosure

- PAR: Royalties for published tests
  - *Ruff Neurobehavioral Inventory*
  - *Ruff Selective Attention Test*
  - *Ruff Figural Fluency Test*
  - *Ruff Visuo-Spatial Learning Test*
- Guilford Press: Royalties for published book
  - *Effective Psychotherapy for Individuals with Brain Injury (Guilford Press, 2014)*

GRATITUDE & DEDICATION

- Professor Etienne Perret – Mentor at University of Zurich
- Professor Karl Pribram – Mentor at Stanford University
- Professor Larry Marshall – Mentor at UC San Diego
- Professor Jeff Barth – Mentor, Friend & Colleague

KEY NOTE ADDRESS

- 2002 NAN – My Presidential Address in San Francisco was
  - A Friendly Critique
  - Ruff, R.M. "A friendly critique of neuropsychology: Facing the challenges of our future." Archives of Clinical Neuropsychology 18, 847-864. (2003)
- Today I was asked to provide a similar lecture regarding the CHALLENGES OF OUR FUTURE IN 2018

STATUS OF NEUROPSYCHOLOGY

- Past
- Present
- Future Directions

PAST

- The 1st generation of neuropsychologist were asked to determine the locations of brain tumors based on psychometrics test batteries
- Alongside with:
  - EEGs
  - X-rays (two dimensional)
  - In the early 1970s I worked in the Department of Neurosurgery and my **ONLY JOB WAS TO TEST PATIENTS TO LOCALIZE THEIR TUMOR PRIOR TO NEUROSURGERY**

TRAINING OF LOCALIZATION SKILL

- In piles of 50 archival cases our professor asked us to localize the brain tumors –
  - Based only on our review of neuropsychological tests
- Thereafter our professor publicly provided each us with our accuracy rate
- This process was repeated until hit rates of 90% or higher were achieved

WHAT DID THE REPORTS LOOK LIKE?

- Name of Patient:_____ Date of Testing:_____
- Localization of Tumor:
  - Left Right
  - Frontal Temporal Parietal Occipital

_____

Comment: (e.g., verbal memory deficits)

Computer Tomography Replaced Neuropsychology

- Thus the neurosurgical department no longer needed our services
- Our neuropsychology unit was moved out of the Neurosurgical Department in the Main Hospital
  - We were relocated into an ancillary hospital building
  - We became the Neuropsychology Unit in the Department of Neurology
  - We tested patients to determine their neuropsychological status in patients with strokes, degenerative disorders etc.

HOW DID THIS AFFECT MY PERCEPTION OF MY CHOSEN PROFESSION?

- Felt our services were ancillary and far less clinically relevant
  - Diagnostic relevancy was significantly reduced
  - Neurologists were the key diagnosticians
  - Neuropsychologist reported on the cognitive deficits, which in most in-patients were severe and thus obvious
  - Excitement of competition was lost between the accuracy of dx
    - 2-dimentional X-ray, vs. EEG, vs. Neuropsychology

HOW DID THAT CHANGE MY PERCEPTION OF NEUROPSYCHOLOGY?

- I felt that my contribution was diminished
  - My focus changed to brain research with monkeys to better understand different brain regions
  - Left Switzerland – studied a half year at Oxford & 2 years Stanford University
- 2 years trained & tested monkeys before and after a specific brain regions was removed
- To publish the articles, the monkeys needed to be killed to verify the localization of brain lesions

CHANCE

- Supervised a grad student's dissertation
- To check his experimental procedures, I visited the hospital where he tested TBI patients
- I had missed the clinical setting
- In TBI patients localizing their brain damaged was not the focus or a primary issue
- Instead the issue was how far can we assist the patients' recoveries

A JOB AT UC SAN DIEGO ADVERTISED A RESEARCH POSITION FOR A NEUROPSYCHOLOGIST

OUTCOMES IN SOLDERS IN VIET NAM WERE SUPERIOR TO MEDICAL CENTERS IN THE US

FOCUS WAS ON BEST OUTCOMES & NOT LOCALIZATION

COMA DATA BANK

- Worked 10 years at UCSD seeing every TBI patient that signed up to participate
- I provided free follow-up feedback sessions to hopefully improve their participation over 5 years
- In return the families inundated me with excellent questions and also educated me what it was like to live with a brain injured family member

EDUCATED BY GREAT COLLEAGUES

- Universities of Texas - Harvey Levin
- University of Virginia – Ted Peck, Jeff Barth & Jeff Kreutzer

- Golden Hour Hypothesis was confirmed–
  - Hospital were rated & Level I, which included helicopters for fast evacuation &
  - 24 hour neurosurgical care

STARTED SUPPORTIVE MEETINGS AT UCSD

- Group Meetings for both TBI patients and their Family Members at the same time
  - In two rooms in the Hospital Cafeteria
  - No cost

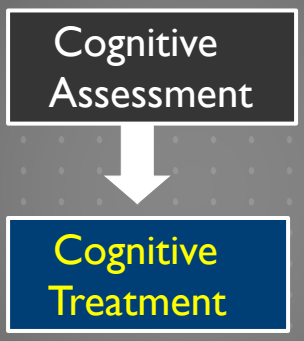
- My aim of making a difference in my patients life was again met

STATUS OF NEUROPSYCHOLOGY

- Past
- Present
- Future Direction

MY FOCUS BECAME THE ASSESSMENT & TREATMENT OF MY PATIENTS' COGNITIVE STATUS

NEUROPSYCHOLOGICAL DISCIPLINE NOW



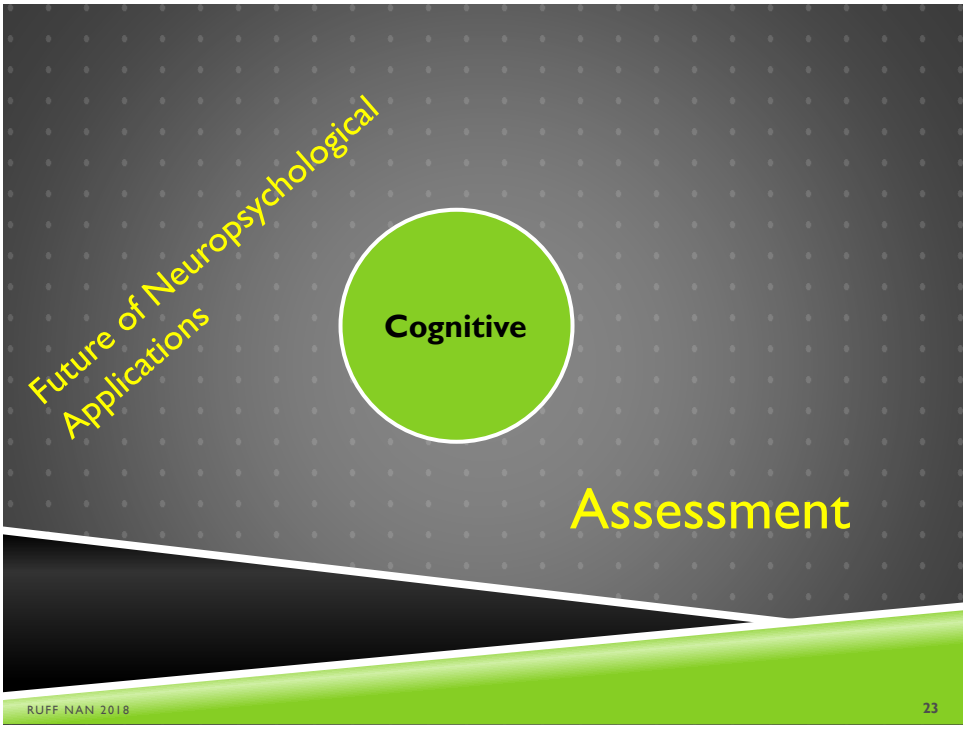
COGNITIVE REMEDIATION - POSIT SCIENCE

- I joined large team – lead by Professor M. Merzenich at UCSF, who is a leading authority on brain plasticity – to developed a comprehensive program for cognitive rehabilitation.
- Our aim was to develop efficacious, easily accessible. and affordable tools for cognitive rehabilitation in collaboration other Universities.
- Multiple efficacy studies have been published in collaboration with other universities such as University of Southern California, Mao Clinic
- NOW AVAILBLE TO ANYONE FOR A SMALL FEE VIA THE INTERNET

FUTURE DIRECTIONS OF NEUR0PSYCHCHOLOGY

Future of Neuropsychological Applications that are needed

- How can we serve our patients with the best possible assessments and treatments?



NEUROPSYCHOLOGICAL ASSESSMENT

Cognitive

Reasonably Good Assessments:

- Basic Verbal skills
- Basic Spatial skills
- Level of Intelligence in both the verbal & visuo-spatial modalities
- Working Memory in both the verbal & visuo-spatial modalities
- Verbal learning
- Attention span in both the verbal & visuo-spatial modalities

NEUROPSYCHOLOGICAL ASSESSMENT

Cognitive

Most often absent

Visuo-spatial Learning
Sustained Attention - Vigilance

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Future of Neuropsychological Applications that are needed

- WE NEED MORE REFINED FRONTAL LOBE TESTS

WE NEED TO DEVELOP

Cognitive

- Tests that evaluate the prefrontal lobes

Our current tests have Sub-optimal ecological validity

NEUROPSYCHOLOGICAL ASSESSMENT

Cognitive

Current Tests assess a patient who is

- Sitting on a comfortable chair
- Is given simple instructions

This assessment is suboptimal & not what patients encounter at home

NP ASSESSMENT OF THE FRONTAL LOBES

Cognitive

Bob Sbordone had patient walk to a nearby grocery store where they were asked to purchase a number of items and pay for them - while he secretly observed his patient

FUTURE
WE NEED PRE-FRONTAL LOBE TESTS

- INTERACTIVE COMPUTER VIDEOS
- PROVIDE DIFFERENT LEVELS OF PROBLEMS THAT PATIENTS NEED TO SOLVE
- A COMBINATION OF EMOTIONAL & COGNITIVE PROBLEM SOLVING

FUTURE - CONTINUED

THE TIME HAS COME FOR US TO DEVELOP COMPUTERIZED TEST BATTERIES T0 EVALUATE EACH PATIENT'S UPPER LIMITS ACROSS ALL KEY COGNITIVE DOMAINS

WE NEED MULTIPLE PARALLEL VERSIONS – 2 VERSIONS IS OFFTEN NOT ENOUGH

WE NEED ON-LINE COMPUTER SCORING

INTERACTIVE VIDEO ARE NEEDED THAT DYNAMICALLY REQUIRE A COMBINATION OF EMOTIONAL & COGNITIVE PROBLEM SOLVING

I PREDICT THAT COMPUTER TESTING WILL BE SUPERIOR

- VIDEO BASED FRONTAL LOBE TESTS SHOULD BE DEVELOPED THAT ARE LIKE WATCHING TV
  - ECOLOGICAL VALIDITY
  - LESS EXPENSIVE TO ADMINISTER
  - ASSURE ACCURATE COMPUTERIZED SCORING
  - PROVIDE INTERPRETATIONS, FEEDBACK & REPORTS
  - MORE ACCESSIBLE FOR BOTH HEALTHY INDIVIDUALS & PATIENTS

GUIDELINES FOR COMPUTERIZED TESTING

Bauer, R.M., Iverson, G.L, Cernich A.N., Binder, L.M., Ruff, R.M., and Naugle, R.I.
"Computerized neuropsychological assessment devices: Joint Position Paper of the American Academy of Clinical Neuropsychology and the National Academy of Neuropsychology.
Archives of Clinical Neuropsychology 27, 362-373. (2012)

WE NEED TO FIND WAYS TO ASSESS FATIGUE

EARLY PART OF EXAMINATION
MIDDLE
END

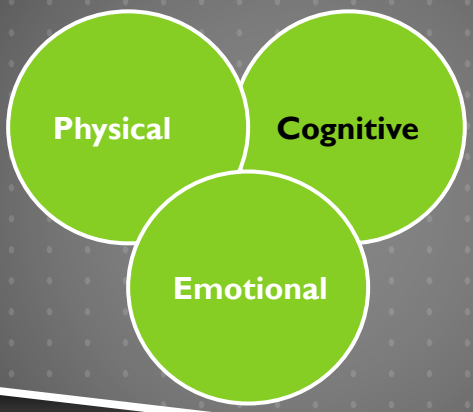
IN ORDER TO DETERMINE HOW FATIGUE IS AFFECTING THE PATIENT'S COGNITIVE PERFORMANCES

RUFF 2 AND 7 SELECTIVE ATTENTION TEST. PROFESSIONAL MANUAL BY R.M. RUFF & C.C. ALLEN (65 PAGES). ODESSA, FL: PSYCHOLOGICAL ASSESSMENT RESOURCES, INC. (1996)

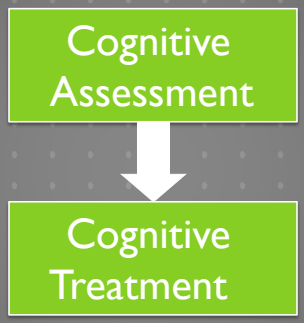
- FUTURE IMPROVEMENTS

WE NEED BETTER PSYCHOMETRIC ESTIMATION OF PRE-MORBID FUNCTIONING

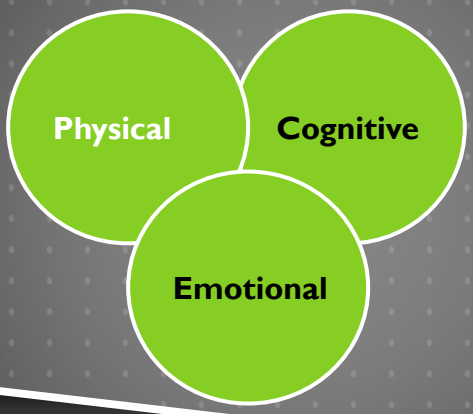
BRAIN FUNCTIONS

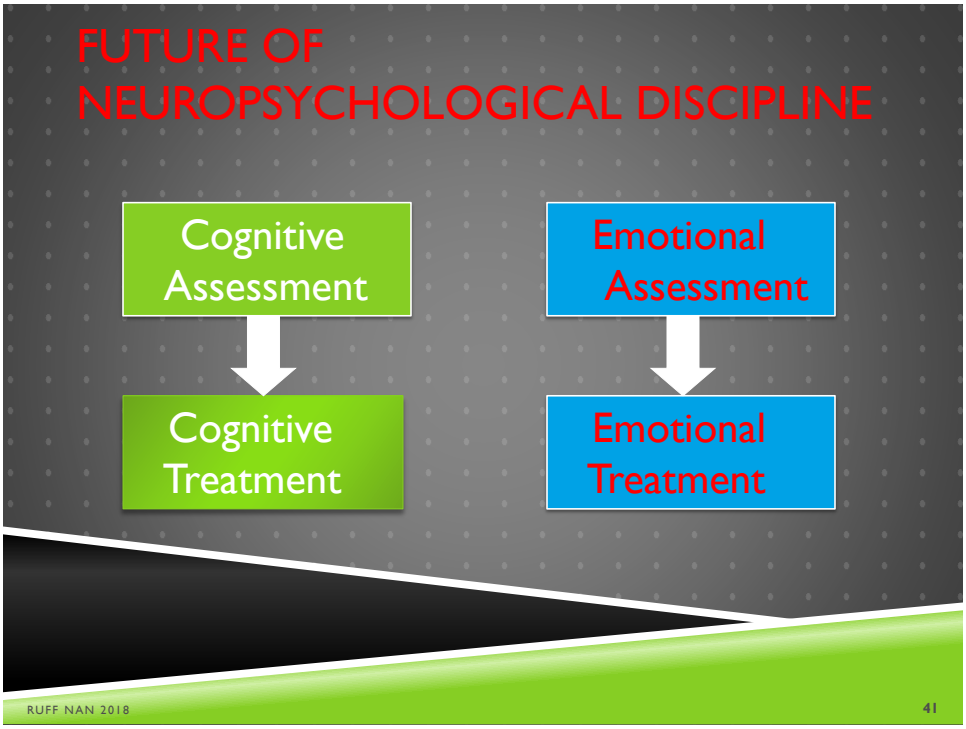


CURRENT NEUROPSYCHOLOGICAL DISCIPLINE



BRAIN FUNCTIONS




FUTURE OF NEUROPSYCHOLOGICAL DISCIPLINE
Cognitive Assessment
Cognitive Treatment
Emotional Assessment
Emotional Treatment
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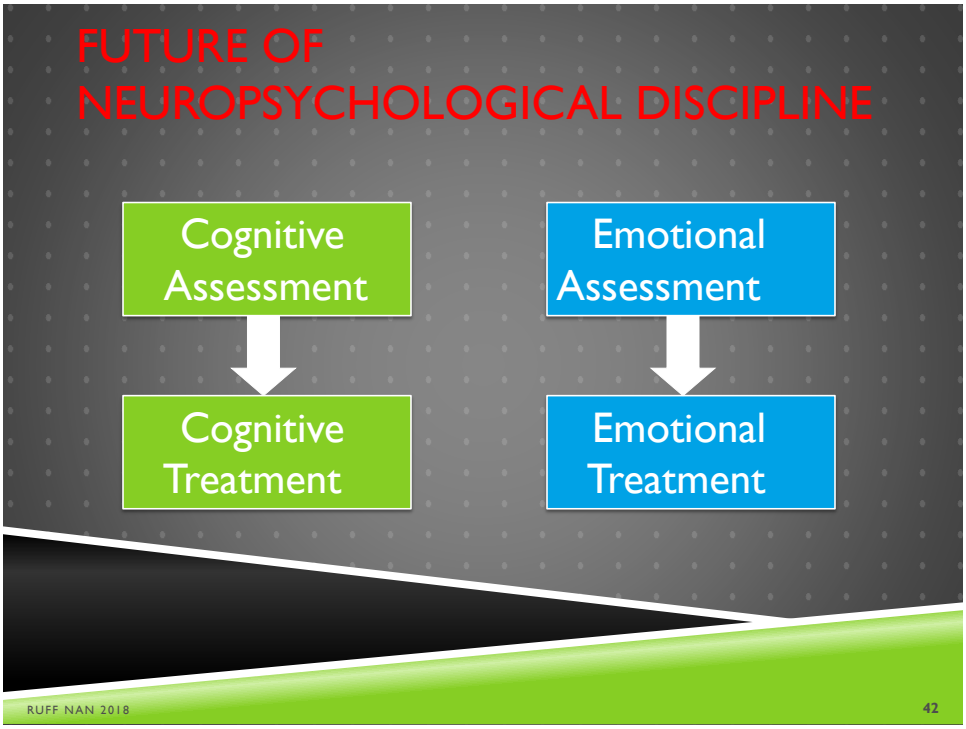
FUTURE OF NEUROPSYCHOLOGICAL DISCIPLINE
Cognitive Assessment
Cognitive Treatment
Emotional Assessment
Emotional Treatment
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NEW EMOTIONAL ASSESSMENT

WHY ARE WE USING TESTS THAT WERE DESIGNED TO CAPTURE PSYCHIATRIC SYNDROMES, SUCH AS MMPT, MCMI?

IS THIS BECAUSE WE ARE LAZY OR WORSE…STUPID?

IS THIS BECAUSE WE REALLY BELIEVE THAT BRAIN DAMAGE CAUSES COMMON PSYCHIATRIC ILLNESSES, SUCH AS SCHIZOPHRENIA, DELUSIONS, BI-POLAR DISORDER?

WHILE FILLING OUT THE MMPI, MCMI, ETC. MANY PATIENTS HAVE ASKED ME:

"DO I ANSWER THESE QUESTIONS AS I WAS BEFORE OR AS I AM NOW?"

WHAT IS NEEDED FOR PATIENTS WITH ACQUIRED BRAIN DAMAGE?

1. Understanding of premorbid status
2. Understanding of current status
3. An understanding of the differences
4. Across multiple domains

2ND PROBLEM

ARE THE CAUSES FOR A PSYCHIATRIC ILLNESSES AND BRAIN TRAUMA THE SAME?

MMPI DX DEPRESSIVE DISORDER

WHEN PATIENTS ENDORSE THE FOLLOWING

- Sadness
- Fatigue
- Altered appetite
- Reduced interest in sex

Depression is likely

WHEREAS IN BRAIN INJURED PATIENTS THESE SYMPTOMS ARE OFTEN DUE TO COMPLETELY DIFFERENT CAUSES, SUCH AS:

Sadness	No longer able to work
Fatigue	Poor sleep due to neck pain
Altered appetite	Due to loss of smell
Reduced interest in sex	Due physical to fatigue & pain

Depression is not the Main Cause

What is needed for brain injured patients?

• Physical Status	Pre & Post
• Cognitive Status	Pre & Post
• Emotional Status	Pre & Post
• Quality of Live Status	Pre & Post

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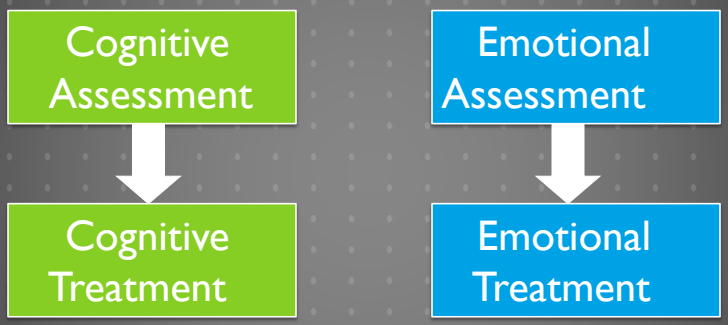
FUTURE OF NEUROPSYCHOLOGICAL DISCIPLINE



CHALLENGES FOR PSYCHOTHERAPIST WHEN TREATING PATIENTS WITH ACQUIRED BRAIN DAMAGE (ABI)

- Limits of Traditional Treatments with ABI
  - **Retrospection** – Identify developmental causes and issues for psychopathology (e.g., flawed coping styles)
  - **Introspection –** Self-reflection is needed to achieve changes through re-interpretation
  - **Insight –** Facilitate patients in their discovery of more adaptive ways to cope and function

PSYCHOTHERAPISTS' TRAINING

- My training as a Jungian analyst – gone
- Training as a neuropsychologist – not very helpful
- Training in psychopathology – limited application

ADAPTING TREATMENT APPROACH

Relied on Bottom-up Approach –

"I never had an ABI and thus I need to learn from you how it feels like to live inside and injured brain…please educate me about…"

Connect –

"Tell me what you strengths are so that together we can develop the best plan for your treatments…"

"PATIENTS DO NOT CARE HOW MUCH YOU KNOW UNTIL THEY KNOW HOW MUCH YOU CARE"

Carl Rogers

8 – STEP TREATMENT OF EMOTIONS

1. Patients need to grasp the importance and power of their emotions
2. Patients need to understand how their emotions have been affected by the acquired brain injury
3. Patients need to be motivated to become their own energy managers

8 – STEP TREATMENT (CONTINUED)

4. Patients need to learn ways to optimally reduce their level of Anxiety
5. Learn to manager their Depression
6. Learn to manage their Anger
7. Understand and accept biopsychosocial nature of deficits
8. Develop a meaningful future based on patient's core values

1ST GOAL: GRASPING THE IMPORTANCE OF EMOTIONS

- Why is the patient coming to psychotherapy?
  - Sent by family member, physician or friend?
  - How does the patient value his/her emotions?

EDUCATE PATIENTS ON THE IMPORTANCE OF EMOTIONS

- Assess if patient **prior to the ABI** was:
  - Not psychologically minded
  - Did not believe in psychotherapy (e.g., thought emotions were fully under his/her control)
- Examine if patient acknowledges that **after the brain injury** emotional problems emerged that need to be remedied

ENGAGING QUESTIONS

- What role do emotions play in your life?
- Can you identify and describe the emotions you are feeling now?
- What is more important to you – your physical health or your emotional health?
- Why do you think it is more stigmatizing in our society to suffer from an emotional illness than a physical one?

1ST GOAL – SUMMARY

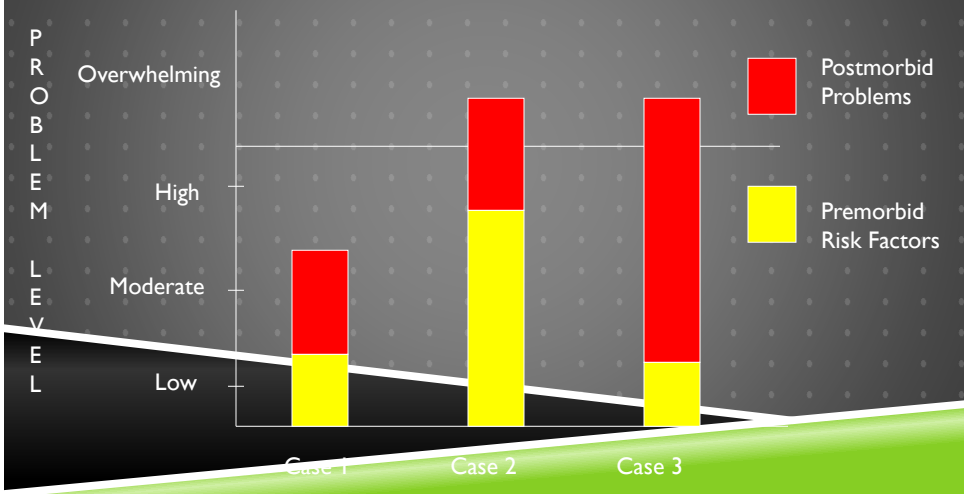
PSYCHOTHERAPISTS NEED TO GRASP HOW IMPORTANT EMOTIONS ARE FOR EACH PATIENT

- Engaging in psychotherapy without explicitly knowing your patient's beliefs, attitudes and expectations of psychotherapy increased the chance of misalignment and failure

2nd Goal

Patients need to understand how their emotions have been affected by the ABI

VULNERABILITY CAUSED BY DIFFERENT PRE & POST-ABI EMOTIONAL RISK FACTORS



3rd Goal

- Patients need to become their own ENERGY MANAGERS

MONITORING BOTH POSITIVE AND NEGATIVE ENERGY SOURCES

- Sleep – duration and depth
- Nutrition – balanced diet/weight
- Exercise & activity levels
- Stress level
- Pain level

ENERGY MANAGEMENT

- Poorly Managed Energy can increase

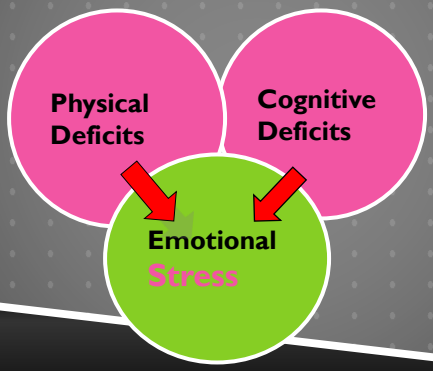
- Depression
- Stress levels
- Anger levels
- Interfere with social interactions

4TH TREATMENT GOAL - STRESS

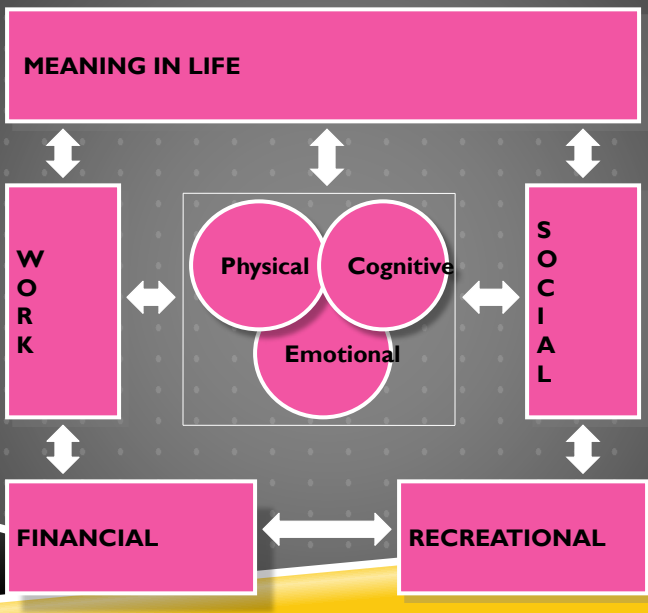
Patients need to learn ways to optimally reduce their level of:

- **Anxiety and Stress**

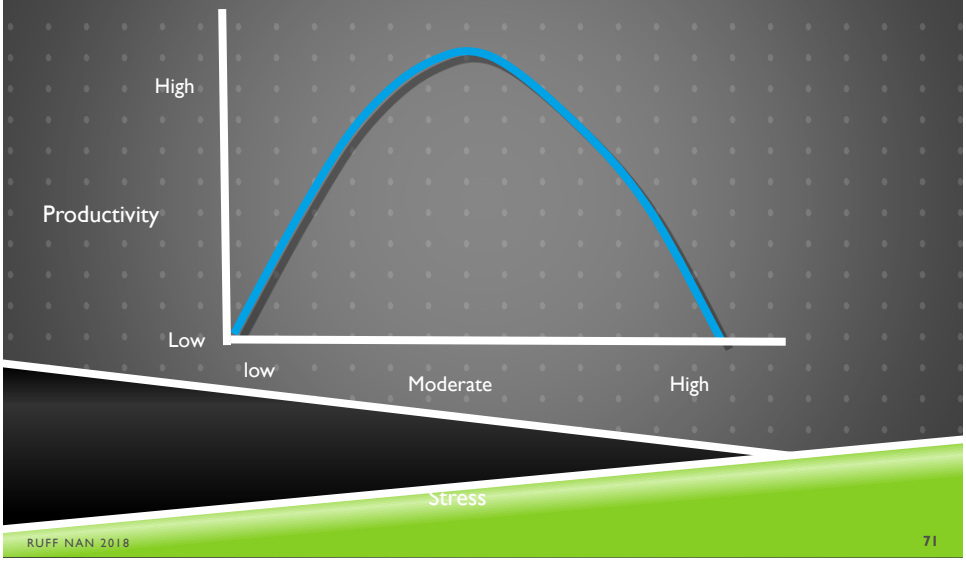
BIOPSYCHOSOCIAL DEFICITS CAN LEAD TO EMOTIONAL PROBLEMS



PATIENT-BASED PERSPECTIVE



STRESS AFFECTS PRODUCTIVITY



STRESSORS	CONTROL	PRIORITY
Neck pain	No control	Low
Headaches	No control	Monitor meds (6)
Marriage	Partial control	Therapy (1)
Job security	No control	Low
Anosmia	No control	Low
Depression	Control	Meds & Tx (2)
Finances	Partial control	Assistance (3)
Son's academics	No control	Monitor (5)
Father's health	No control	Supportive (4)

5TH GOAL: TREATING DEPRESSION

The multiple sources must be accurately assessed before treatment

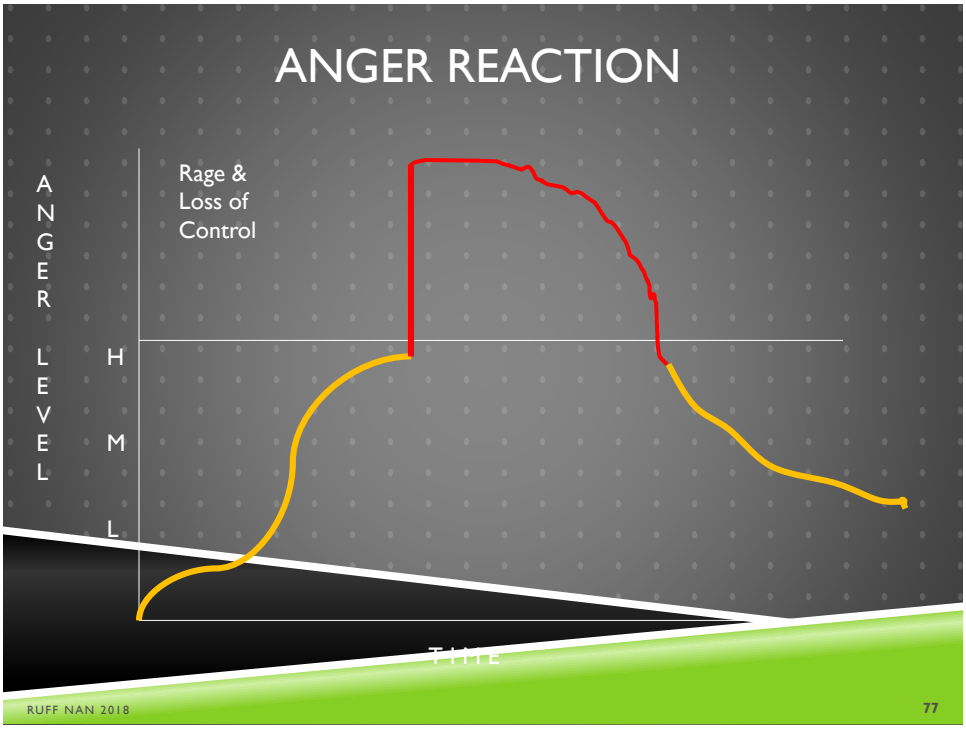
EMOTIONAL SOURCES OF DEPRESSION

CONFRONT FLAWED EXPECTATIONS

Unrealistic Goal	"All I want is to return to my former life."
Flawed Expectations	"All I want is to be happy."
False Convictions	"I can do anything as long as I try my very best."

6TH GOAL MANAGING ANGER

- Anger can be acute or chronic
- Anger can be fueled by high stress
- Anger can have its source in depression
- Anger can be cumulative
- Anger can be a source of gaining control
- Anger can be a habit
- Anger can be a motivator and lead to action


ANGER REACTION
ANGER LEVEL
H
M
L
Rage & Loss of Control
TIME
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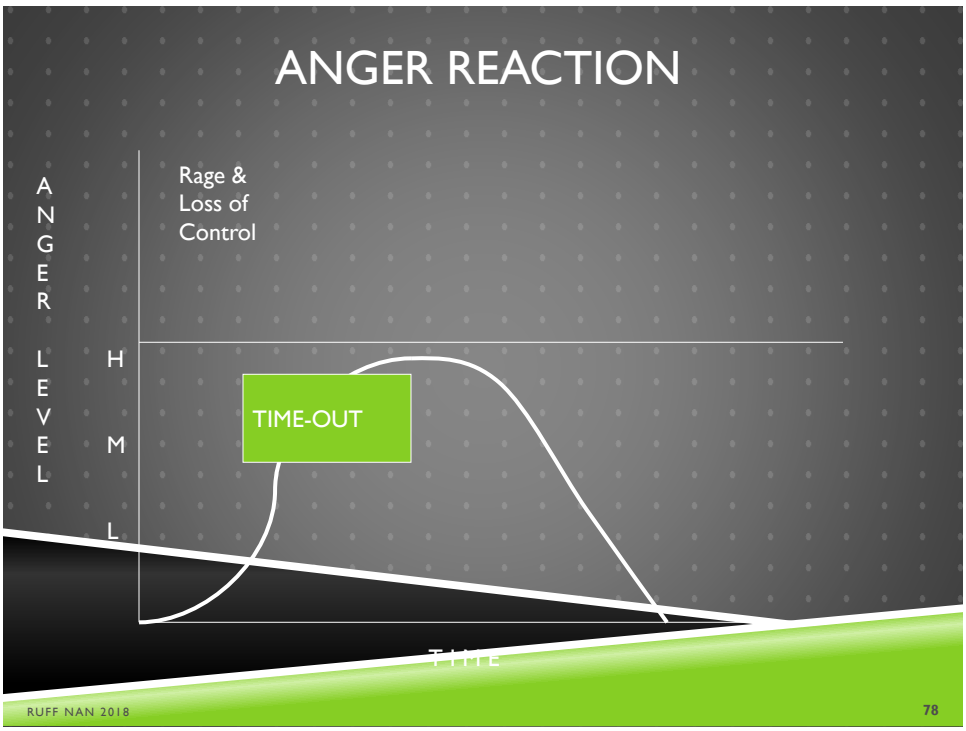
ANGER REACTION
ANGER LEVEL
H
M
L
Rage & Loss of Control
TIME-OUT
TIME
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7th Goal

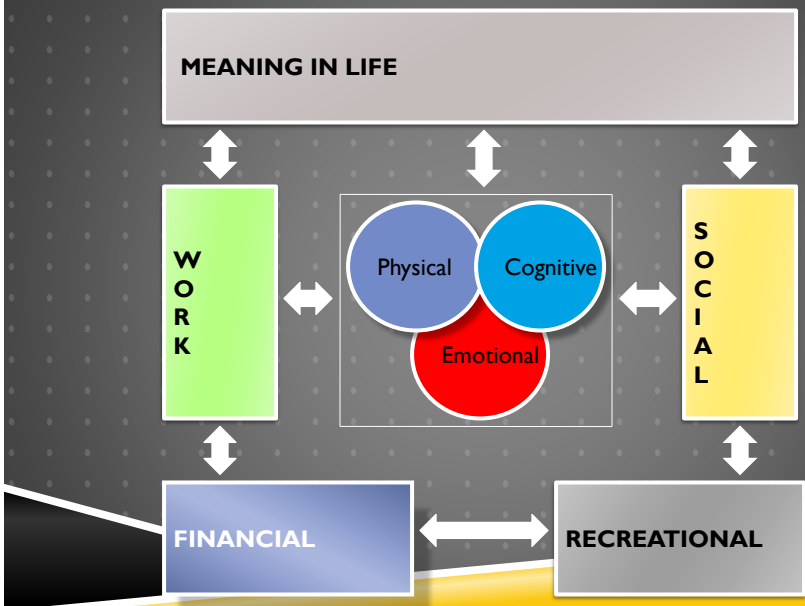
Encourage Patient to take on the Responsibility of Managing Their Life with an ABI

- This Goal is only achievable if the patient demonstrates an:
  - Awareness of current status
  - Acceptance of current status

HOW ARE OUTCOMES BEST DEVELOPED

The patient has to be empowered to take control

PATIENT-BASED PERSPECTIVE



APPROACH FOR DEALING WITH ABI PATIENT

- Invent new approach
- Grieve the loss of the expected future
- Develop new meaningful future

APPROACH FOR DEALING WITH ABI PATIENT

- Invent new approach
- Grieve the loss of the premorbid expected future
- Develop new meaningful future

PHASE 1: IDENTIFY ROLE MODELS

- In your family: Grandma
- In history: Abraham Lincoln
- In general: Key moral values

PHASE 2:
ASSIST PATIENTS TO ALIGN WITH THEIR CHOSEN VALUES

- If Moral Character is selected as the primary value
  - Explain that most ABI survivors can achieve this as well as they could before the ABI
  - Coping with adversity can enhance character
  - Self-worth through strong character will outlast values that are based on more superficial values

PHASE 4:
DEFINE SUCCESS

- Define success at a level where you can become successful
- Re-create a future that you assign meaning to
- Have patient commit to become disciplined

SUMMARY

Empower patients to
set realistic goals
& become their own manager

SUMMARY

- Provide patient with a conceptual framework for "outcome"
- Encourage patient to define or redefine their inner values
- Decisions are based on values, thus strong moral values should become the anchor
- Avoid being trapped by only superficial values

FINAL TAKE-HOME MESSAGE FOR THERAPISTS

Change is not primarily about logic…
if it were so, we would stop consuming too much food, alcohol, losing our temper, sticking with bad habits etc.

People change when they gain insights that provide compelling reason to change

Creating a meaningful life is the most important dimension of our existence

FUTURE OF NEUROPSYCHOLOGICAL DISCIPLINE