What Is "Getting Better"?

It Depends on Who You Ask

David Krych, MS- CCC-SLP

What Is Getting Better?
It Depends on Who You Are Asking:

- The Person Injured
- The Family
- The Physician
- The Therapist
- The Payer

And How You Look at the Question

- Technology
- Medical care and intervention
- Social awareness
- Clinical interventions

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Early Response

- Henriksson, E. M., Öström, M. Eriksson, A. (2001) Preventability of vehicle-related fatalities. Accident Analysis and Prevention, 33, 467-475
  - A Swedish study of traffic crashes concluded that 48% of those who died sustained non-survivable injuries.
  - Out of the group who sustained survivable injuries;
    - 5% were not located in time to prevent death,
    - 12% could have survived had they been transported more quickly to a hospital
    - 32% could have survived if they had been transport quickly to an advanced trauma centre

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EMS Benchmarks

- EMS benchmark for municipal and career fire departments is the National Fire Protection Association's (NFPA) 1710: (adopted 2004)
  - Turnout time of one minute.
  - Arrival time four minutes or less.
- In geographically scattered population areas 15 to 20 minute response times are more likely depending on the financial resources available.

An ED on Wheels

- Highly trained first responders
- Radio Telemetry
- Immediate administration of drugs
- Specialized Trauma Destinations

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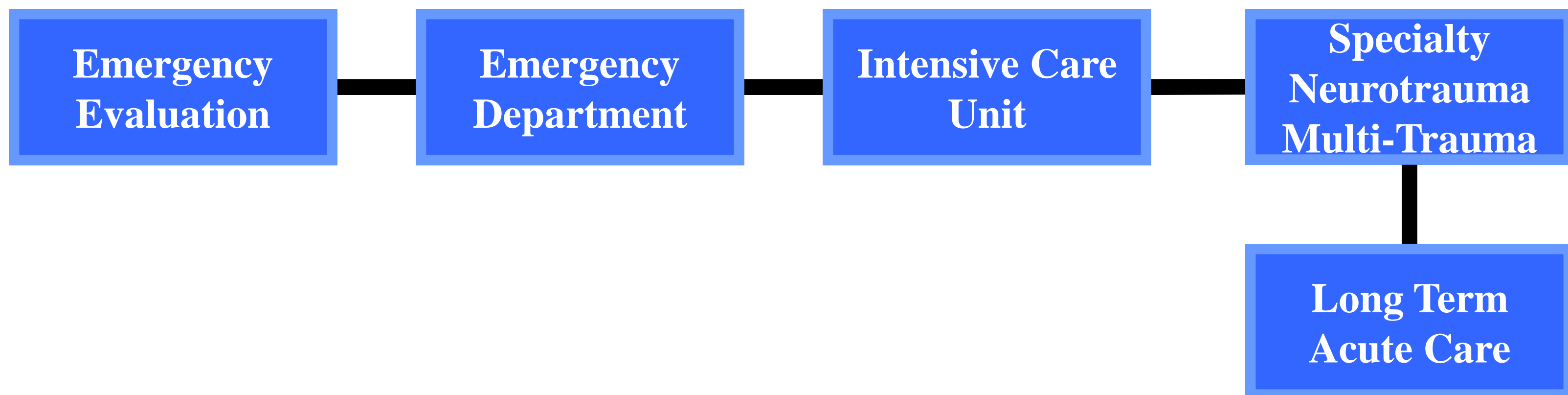
Continuum of Care - Acute



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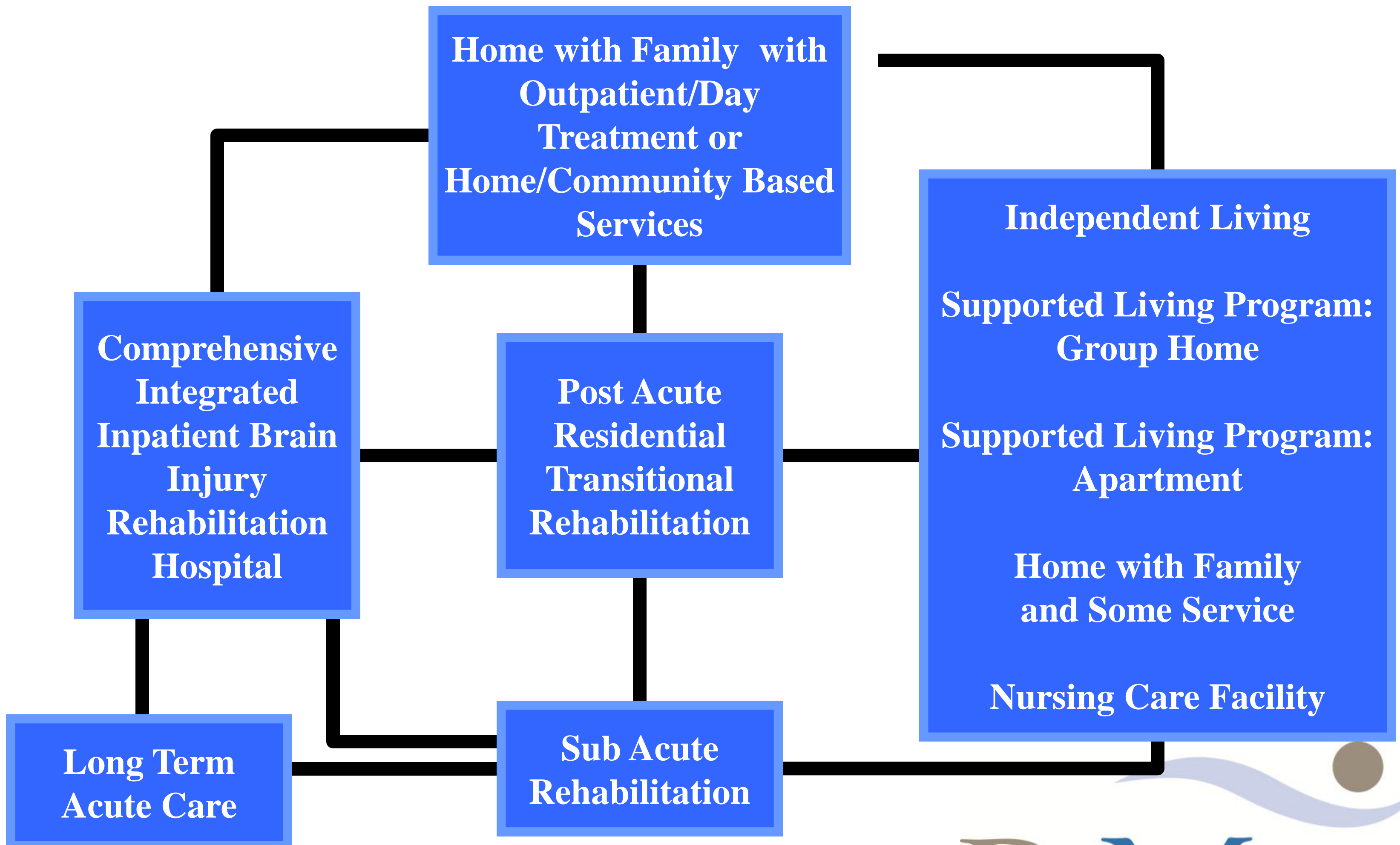
Continuum of Care – Post-Acute



The Physician and Early Intervention

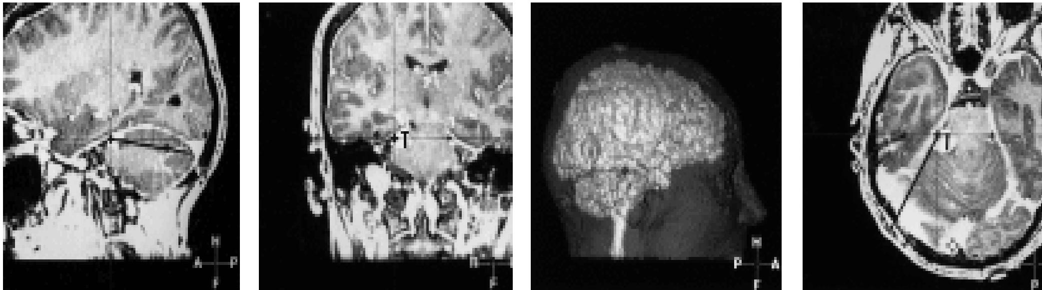
ED – Save the life: interventions have improved significantly

- Reduced transit times
- ED on wheels Specialized in-route communications/management
- Specialized trauma centers GCS:

- GCS reliable/ objective recording of conscious state of a person, for initial as well as subsequent assessment.
  - Used by EMS and doctors in all ED, acute and trauma patients
  - Score: between 3 (indicating deep unconsciousness) and 15
  - Also used in monitoring chronic patients in intensive care other ICU scales
- Other ICU scales
  - APACHE II, Acute Physiology and Chronic Health Evaluation II
  - SOFA; Sequential Organ Failure Assessment score to assess the status of the central nervous system
  - SAPS II: Simplified Acute Physiology Score

Neurosurgery
Frameless Stereotaxy

- “Real time” information for the neurosurgeon from both stored computed tomography & magnetic resonance images
- The sensor can define the best position of craniotomy, helping minimize its size and, once the skull is open, find the lesion



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Imaging

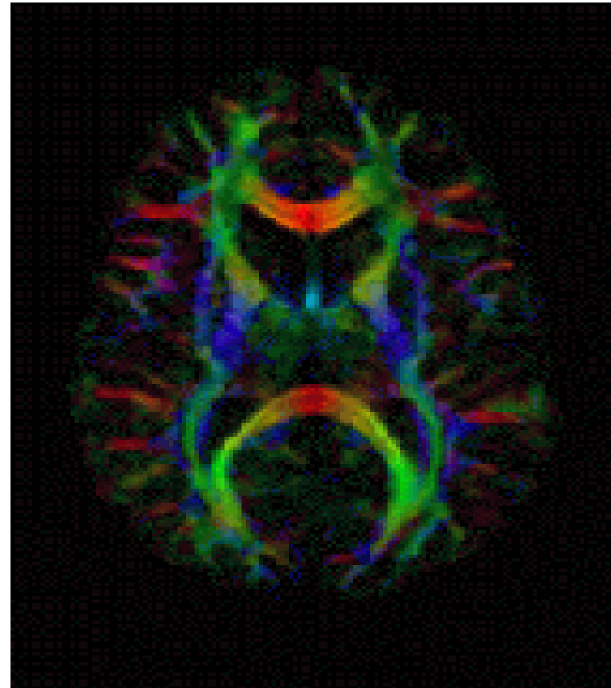
Imaging has improved and we are poised for some significant breakthroughs relating not only to geography but function and system integrity as well

- SPECT: Single Photon Emission Computed Tomography- 3-D brain blood flow
- MRS: Magnetic Resonance Spectroscopy – Biochemical scan
- fMRI: Functional Imaging – real time blood oxygenation linked to neural activity
- Diffuse Tensor imaging – T3

Diffuse Tensor Imaging

- Shows axonal integrity: ie impact of DAI
- Shows axonal function
- Shows connectivity
- May eventually show the link between NP evaluation and neuronal damage
- Better understanding of MRS and concussion
- Better diagnosis of above = better treatment plans

- White Matter Normal Brain



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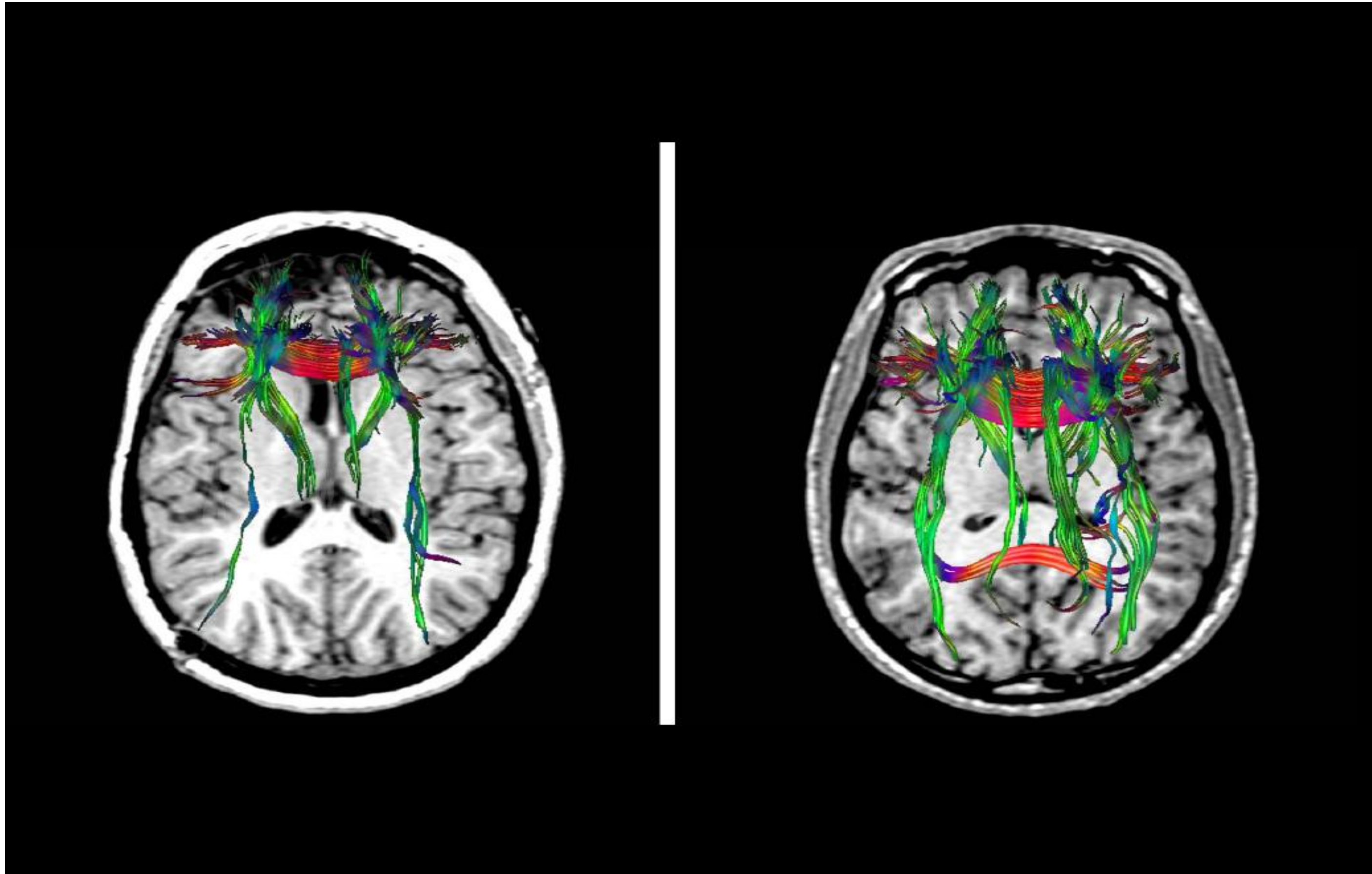
T-3 Images Control on R



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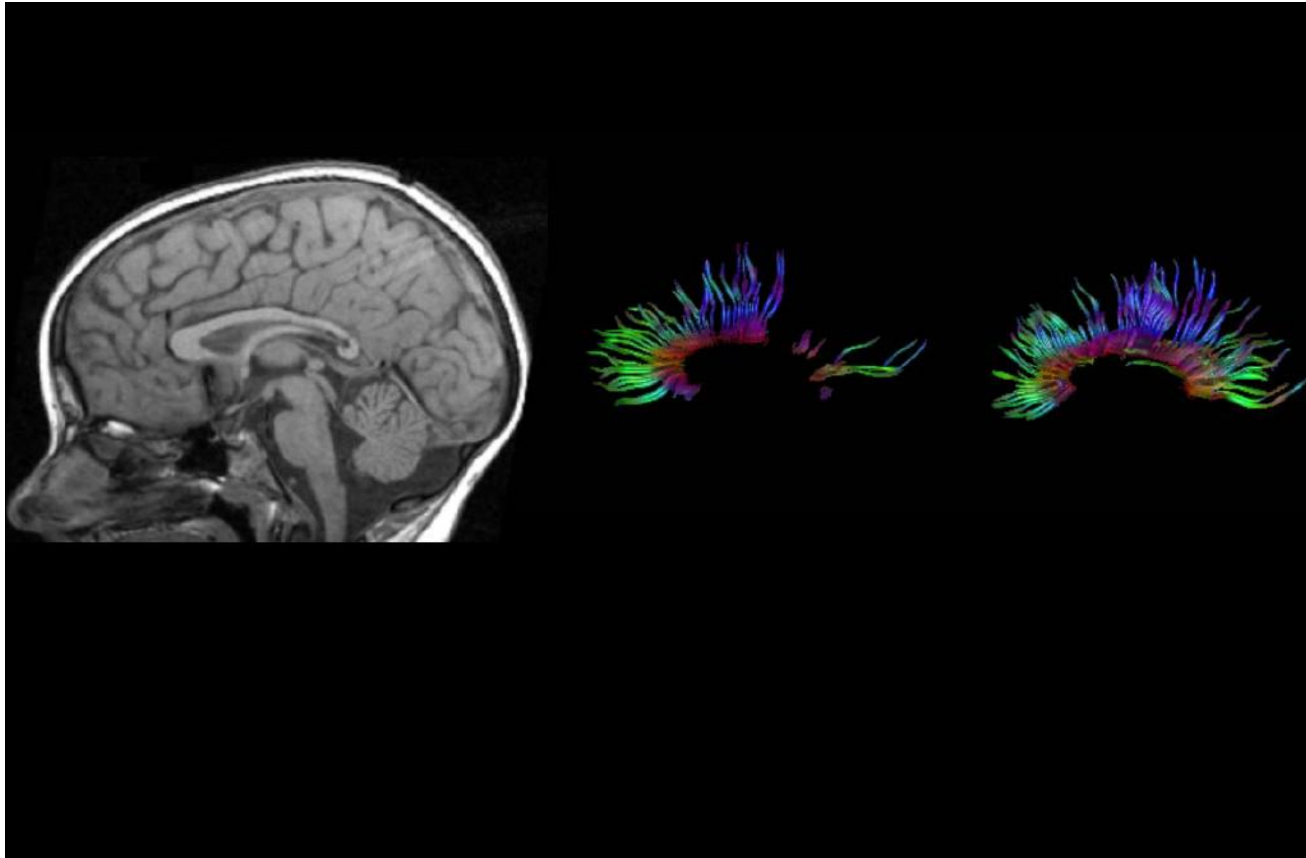

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The Person Who Was Injured

- Self perception:
  - Parent
  - Spouse
  - Work/ student
  - Social position
  - Leisure and recreational interests
- What has changed?
  - Everything
- They want to be the person they were

The Family

- Loss of loved one: “not the same anymore”
- He/ She died: How do you mourn?
- Loss of income
- Change in SES
- Caregiver role
- They want the person back

Dawson & Chipman, 1995 Canadian study: 454 participants Mean = 13 years post-injury; Mod- Sev GCS 9-12= Mod

- 66% needed some ADL assistance
- 75% not working
- 90% dissatisfaction with social integration
- 47% not talking with others on phone
- 27% never socialize at home
- 20% never visit others

Pickelsimer et al, JHTR, 2007

- n= 1830
- 66.5% id'd unmet needs:
- Not prepared to manage
  - mood changes/ personality
  - emotional upset of loved one
  - stress

Family Status

- Lezak, 1985: 80% of individuals w/TBI go through divorce or estrangement- 2 yrs post
- Compared to current US census data: about 50% of all marriages end in divorce. Within 3 years 74% remarry
- Ashley & Krych, JROM, vol 1,#4, 1997 Long Term Follow-up
  - N= 332: mean 7 years post injury
  - 56.1% not married at time of injury
  - 74% no change of marital status at time of follow-up

Physicians and Therapists

- In the longer journey
- Negotiation

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Physiatry

- A more widely recognized specialty
- Integrative process: Brings all of the various specialties together
- Have gone beyond sports medicine and orthopedic rehabilitation to become more specialized: TBI, SCI, Burn
- More willing to stay involved for the long haul

Neurology/Neuropsychiatry

- Behavioral Neurology: resurgence in the 80's and 90's mainly due to N. Geshwind: Emphasis on management of conditions and improved outcome will improve, not just diagnosis
- Study of aphasia, anosognosia, agraphia, epilepsy
- New medications for
  - Seizure management
  - Mood stabilization
  - Depression
  - Impulse control
  - Anxiety
  - Behavioral dyscontrol

The Therapists

- Specialty Areas
  - Sp.
    - Dysphagia V/E-Stim,
    - Cognitive rehabilitation: Non aphasia language issues, Cooperative agreement between Neuropsychology and Sp. Supported by ASHA & APA
  - PT
    - Neuro certifications
    - Vestibular certifications

The Therapists

- Psychology
  - Specific certification for Neuropsychology
  - More attention to co-morbidity issues:
    - D&A
    - Pain management
- Occupational Therapy
  - Neuro-developmental certification/ sensory integration
  - Occular motility / applications relating to Vestibular dysfunction
  - Cross treatments with PT

Therapists Define Getting Better as Evaluating And Defining Goals

- Goals are often defined by the setting
  - FSR – fim scores Bottlemiller, 2006 :
  - Stroke: Scores at the extremes of this scale correlate with discharge disposition, while midrange scores do not.
  - Wolfson & McKnight, 2003:
  - Clinicians with less "expertise" were more likely to be overconfident, yielding less accurate scoring.
- FIM scores may not give a good view of Post Hospital abilities.
- Post Hospital services:
  - Are therapists working as a team or independently?
  - Are they familiar with TBI?
  - What are the options.

The Long Haul

- OP
- Home and Community
- Supported Living
- Neurobehavioral interventions
- Need to look at other scales and measures
- Awareness of social capitol

Rancho Los Amigos

- The scale is from one to eight, eight being the highest mental level.
- Level I: No Response
  Level II: Generalized Response
  Level III: Localized Response
  Level IV: Confused-agitated
  Level V: Confused-inappropriate
  Level VI: Confused-appropriate
  Level VII: Automatic-appropriate
  Level VIII: Purposeful-appropriate

Disability Rating Scale

- **Total Score Level of Disability**
  - 0 none
  - 1 mild
  - 2 – 3 partial
  - 4 – 6 moderate
  - 7 – 11 moderately severe
  - 12 – 16 severe
  - 17 – 21 extremely severe
  - 22 – 24 vegetative state
  - 25 – 29 extreme vegetative state
  - 30 dead

Mayo Portland Adaptability Inventory The Only Measure Designed for Postacute

- The Mayo-Portland Adaptability Inventory (MPAI) was designed:
  - to assist in the clinical evaluation of people during the postacute (posthospital) period following acquired brain injury (ABI)
  - to assist in the evaluation of rehabilitation programs designed to serve these people
  - to better understand the long-term outcomes of acquired brain injury (ABI) and measure social connectedness

MPAI-4

- MPAI-4 items provide an assessment of major obstacles to community integration which may result directly from ABI as well as problems in the social and physical environment.
- Periodic re-evaluation with MPAI-4 during postacute rehabilitation or other intervention provides documentation of progress and of the efficacy and appropriateness of the intervention.
- PARF cross facility measurement tool
- BIAA being considered as a cross facility measurement tool
- Creation of a large database that for the first time looks at long term issues and outcomes in non hospital environments.

Social Capitol

- To build social capitol we must be active or present in clusters or communities of people
  - Identify areas of interest
  - Find the community
- Internet
  - Social networking sites
  - www.meetup.com

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When is "Getting Better" Defined as "Not Getting Worse"?

- Community Re-entry
- Long Term Supported living
  - Consistent, productive activity pattern
    - Sheltered work
    - Volunteer
    - Day program
  - Saving the social network
    - Family to the degree that they can
    - Religious affiliations and others
- The idea of "continuum" needs to be rethought. It is more like a system of services that may need to be accessed at various points

Getting Better/Neurobehavioral

- More recognition of the difference between containment and management
- Getting to the least restrictive environment:
  - You get an opportunity for
    - Consistent, productive activity pattern
    - Sheltered work
    - Volunteer
    - Day program
  - Saving the social network
    - Family to the degree that they can
    - Religious affiliations and others

2007 to 2009: 39 Admissions to ReMed's Neuro Behavioral Program

- 74% dc'd to less restrictive environments. In other words, 29 were able to go to environments that were more independent.
  - 13 home
  - 4 to other BI programs not neurobehavioral
  - 3 to their own independent living situations
  - 8 to supported living at ReMed
  - 1 to SNF
- Of the 10 who were not able to transition
  - 1 Psychiatric admission
  - 9 remain in more controlled situations at ReMed

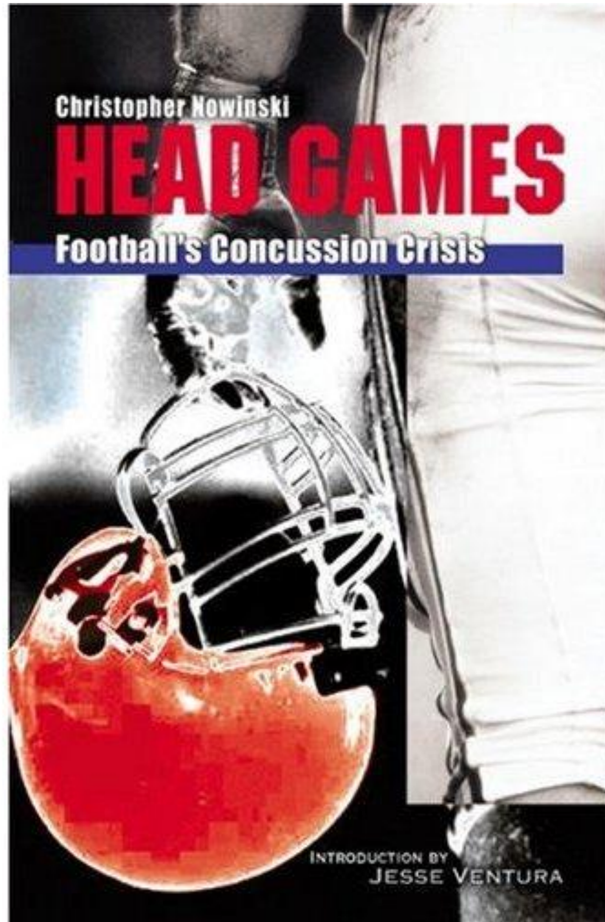
What is "Getting Better" to a Payer?

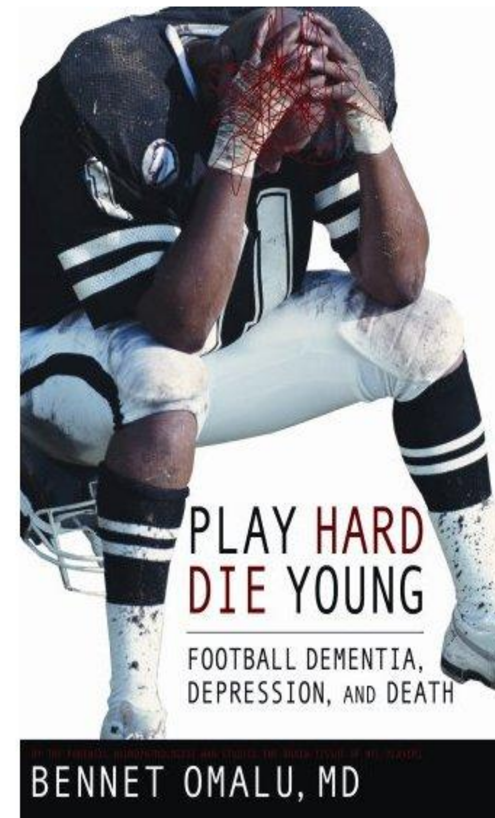
- It depends on the payer and their level of liability.
  - WC, and liability are defined by statute. Their goals will be similar: Get people as well as they can be for the best cost and then keep them medically and socially stable.
- Auto and Health defined by contract limits
  - Health contract defined. X # of visits in x amount of time by x therapist. Some health contracts don't cover rehabilitation. Auto defined by limits of liability. Buyer has more control: Take the lizard with a grain of salt.

Front Page News

- Case Suggests Football Risks Go beyond the NFL: NYT, 10/22/09
- NFL Scolded over Injury to its Players: NYT, 10/29/09
- Criticism for New NFL Doctors: NYT, 5/25/10
- Study Says Brain trauma can Mimic ALS: NYT, 8/8/10
- Blues Forward David Perron Shut Down for the Season Due to Concussion Issues: MSNBC, 3/11/2011

Increasing Awareness; Non-Fiction





CDC Tools

Heads Up
Brain Injury in Your Practice

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION

- http://www.cdc.gov/concussion/HeadsUp/physicians_tool_kit.html
- Acute Concussion Eval form for work and school
- Concussion palm card
- Guidelines for coaches

Where do we Stand?

- People who have had brain injuries and families are involved in grass roots movements and sharing their experiences with others through support groups and social media
- More information available in general
- Medical advances have been significant and continue to come at a rapid pace (first response and medical management)
- More Physicians and Professionals are aware of seriousness of brain injury regardless of "severity" and the long standing issues people deal with
- More have specialty training inc (CBIS)
- Return to play guidelines are being adopted by colleges and states for H.S. athletes and professional sports: NFL, NHL, NBA
- Safety belt use is at an all time high