



**NEURO**  
INSTITUTE

Continuing Education for Rehabilitation Professionals



# Beyond Workbooks: Functional Treatment Strategies for TBI

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## Course Outline

- Brief review of brain injury basics
- Rancho Levels of Cognitive Function-Revised
- Cognitive Processes Targeted in TBI
- Limitations of reliance on workbooks and drill activities
- Developing Functional Tasks
- “Grading” of therapeutic tasks
- Budget-Minded Therapy Ideas
- Question and answers

## Learning Objectives

At the end of this presentation, you will be able to:

- utilize the Rancho Levels of Cognitive Function to develop appropriate therapeutic activities for patients with TBI.
- identify at least two limitations of relying solely on workbook activities and “pen and paper” tasks to address cognitive dysfunction in the TBI population.
- state the importance of utilizing strategies to increase awareness/insight in patients with TBI.

## Causes of TBI

- *Falls*
- *Motor vehicle accidents (ATV, motorcycle)*
- *Assaults*
- *Gunshot wounds*
- *Blast injuries during wartime*

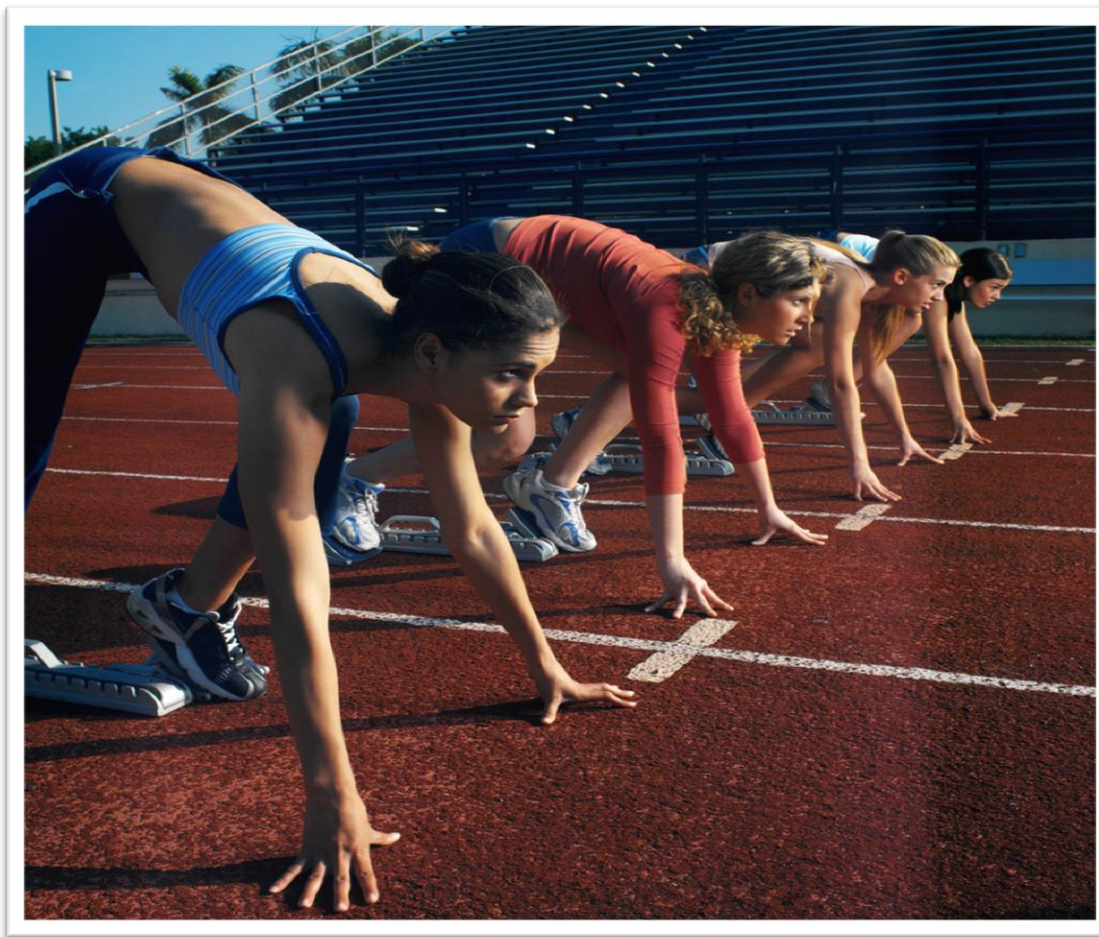
Any event which causes a sudden impact of the brain against the skull can cause TBI.

## Revised Rancho Levels of Cognitive Functioning

- I. No response
- II. Generalized response
- III. Localized response
- IV. Confused, agitated, inappropriate
- V. Confused, inappropriate, non-agitated
- VI. Confused, appropriate
- VII. Automatic appropriate
- VIII. Purposeful and appropriate-SBA
- IX. Purposeful and appropriate-SBA on request
- X. Purposeful, appropriate, Modified Independent

Hagen, C. (1997)

# When Do We Start Therapy?



## Level IV

- Confused, agitated, inappropriate
- May have hallucinatory states
- Post-traumatic amnesia (absent short-term memory)
- Alert and heightened state of activity
- May exhibit aggressive behavior
- Verbalizations may be incoherent or inappropriate

## Level V

- Confused, inappropriate, non-agitated
- May wander randomly or with a vague intent of going home
- Not oriented to person, place, or time
- Can converse on a social, automatic level for brief periods
- Severely impaired recent memory, confusion of past and present
- Unable to learn new information



## Level VI

- Confused, appropriate
- Inconsistently oriented to person, time and place
- Attends to highly familiar tasks in non-distracting environment for 30 minutes with moderate redirection
- Remote recall better than recent recall
- Unaware of deficits and safety risks
- Consistently follows simple directives

## Level VII

- Automatic appropriate
- Consistently oriented to person and place. Moderate assist for orientation to time
- Demonstrates carry-over of new learning
- Unable to think about consequences of decisions or actions
- Unaware of other's needs and feelings
- Unable to recognize inappropriate social interaction behavior

## Level VIII

- Purposeful, Appropriate, Stand-by assistance
- Independently attends to and completes familiar tasks for 1 hour in distracting environments
- Uses assistive memory devices with SBA
- May be argumentative, self-centered, have low frustration tolerance
- Thinks about consequences of a decision or action

## Levels IX and X

- Stand-By Assistance on Request and Modified Independent, respectively
- Can manage multiple tasks simultaneously
- Social interaction consistently appropriate
- Independently initiates daily tasks and thinks about consequences of actions, but may need extra time
- Low frustration and irritability when stressed, sick, or fatigued



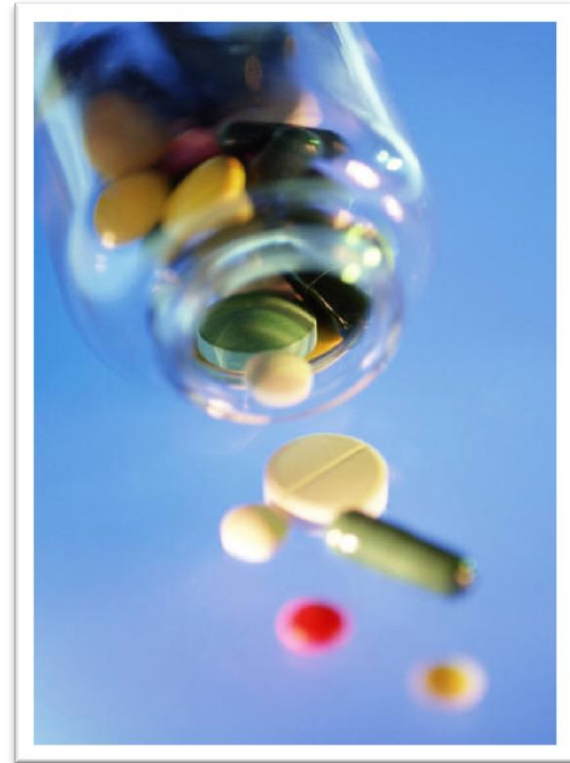
## Attentional Processes Hierarchy

- Focused: Ability to attend to a stimulus.
- Sustained: Also known as vigilance. Ability to maintain attention to a task. Most commonly addressed in therapy sessions. Foundation for other attentional processes.
- Selective: Ability to screen out unimportant or irrelevant information (listening to this seminar while children watching TV in other room).
- Alternating: Alternately doing two things that have different cognitive requirements (i.e.: researching topic online, preparing slides for PowerPoint presentation).
- Divided: Responding to multiple stimuli simultaneously (cooking dinner while talking on the phone).

## Underlying Factors

Underlying factors contributing to inattention or decreased concentration need to be considered:

- *Medications*
- *Poor sleep patterns*
- *Sensory impairments (diplopia, visual field cuts, dizziness, hearing loss)*
- *Pain*
- *Depression*



# Memory

- Working Memory
- Long-term Memory
  - Declarative
  - Non-declarative





## Executive Function

Includes all cognitive processes that are responsible for purposeful and goal-directed behavior



An example of executive function impairment...



## Components of Executive Function

- Planning
- Initiating
- Self-monitoring and self-evaluation
- Organization
- Anticipation
- Judgment

## Insight and Unawareness

- Anticipatory Awareness: Patient is able to anticipate when an impairment will affect performance and implement strategies.
- Emergent Awareness: Patient recognizes when an impairment affects their ability as it occurs.
- Intellectual Awareness: Patient may be aware a problem has occurred, but is unable to identify it.

Crosson et al. (1989).

## Strategies for Lack of Insight/Unawareness

- Videotape patient while engaged in tasks, replay and have him rate performance
- Role-play with other patients in a group
- Have patient estimate performance before a task, then review after task completion
- Rating Scales

## Patient Self-Evaluation

- Before task:
  - How difficult will this be?
  - Will I need to use any strategies?
  - What strategies should I use?
  - What problems might come up?
- After task:
  - How difficult was this for me?
  - How accurate was I?
  - How much help did I need?
  - What could I do differently next time?

## Cognitive Obstacle Course

- Suitcase with mixed clothes and scenario
- Grocery shelves and coupons
- Pipe Tree Assembly
- City Bus Schedule
- Mailbox sort
- Ability to access internet/email
- Automated phone system

## Patient Competency Rating (Patient's Form)

Source: Prigatano, G. P. and Others (1986). Neuropsychological Rehabilitation After Brain Injury. Baltimore: Johns Hopkins University Press.

### Identifying Information

Patient's Name: \_\_\_\_\_

Date: \_\_\_\_\_

### Instructions

The following is a questionnaire that asks you to judge your ability to do a variety of very practical skills. Some of the questions may not apply directly to things you often do, but you are asked to complete each question as if it were something you "had to do." On each question, you should judge how easy or difficult a particular activity is for you and mark the appropriate space.

### Competency Rating

| 1        | 2                    | 3                           | 4                 | 5                |
|----------|----------------------|-----------------------------|-------------------|------------------|
| Can't do | Very difficult to do | Can do with some difficulty | Fairly easy to do | Can do with ease |

- \_\_\_\_\_ 1. How much of a problem do I have in preparing my own meals?
- \_\_\_\_\_ 2. How much of a problem do I have in dressing myself?
- \_\_\_\_\_ 3. How much of a problem do I have in taking care of my personal hygiene?
- \_\_\_\_\_ 4. How much of a problem do I have in washing the dishes?
- \_\_\_\_\_ 5. How much of a problem do I have in doing the laundry?
- \_\_\_\_\_ 6. How much of a problem do I have in taking care of my finances?
- \_\_\_\_\_ 7. How much of a problem do I have in keeping appointments on time?



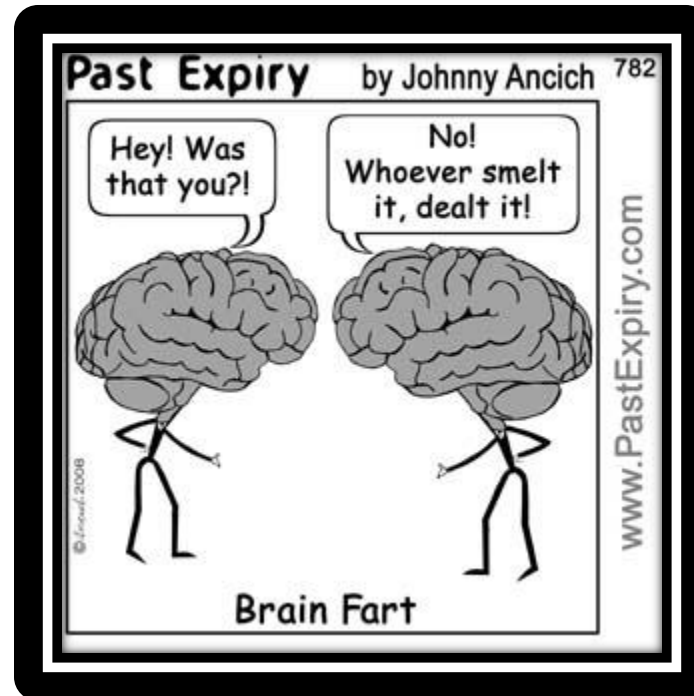
| 1        | 2                    | 3                           | 4                 | 5                |
|----------|----------------------|-----------------------------|-------------------|------------------|
| Can't do | Very difficult to do | Can do with some difficulty | Fairly easy to do | Can do with ease |

- \_\_\_\_\_ 8. How much of a problem do I have in starting conversation in a group?
- \_\_\_\_\_ 9. How much of a problem do I have in staying involved in work activities even when bored or tired?
- \_\_\_\_\_ 10. How much of a problem do I have in remembering what I had for dinner last night?
- \_\_\_\_\_ 11. How much of a problem do I have in remembering names of people I see often?
- \_\_\_\_\_ 12. How much of a problem do I have in remembering my daily schedule?
- \_\_\_\_\_ 13. How much of a problem do I have in remembering important things I must do?
- \_\_\_\_\_ 14. How much of a problem would I have driving a car if I had to?
- \_\_\_\_\_ 15. How much of a problem do I have in getting help when I'm confused?
- \_\_\_\_\_ 16. How much of a problem do I have in adjusting to unexpected changes?
- \_\_\_\_\_ 17. How much of a problem do I have in handling arguments with people I know well?
- \_\_\_\_\_ 18. How much of a problem do I have in accepting criticism from other people?
- \_\_\_\_\_ 19. How much of a problem do I have in controlling crying?
- \_\_\_\_\_ 20. How much of a problem do I have in acting appropriately when I'm around friends?
- \_\_\_\_\_ 21. How much of a problem do I have in showing affection to people?
- \_\_\_\_\_ 22. How much of a problem do I have in participating in group activities?

| 1        | 2                    | 3                           | 4                 | 5                |
|----------|----------------------|-----------------------------|-------------------|------------------|
| Can't do | Very difficult to do | Can do with some difficulty | Fairly easy to do | Can do with ease |

- \_\_\_\_\_ 23. How much of a problem do I have in recognizing when something I say or do has upset someone else?
- \_\_\_\_\_ 24. How much of a problem do I have in scheduling daily activities?
- \_\_\_\_\_ 25. How much of a problem do I have in understanding new instructions?
- \_\_\_\_\_ 26. How much of a problem do I have in consistently meeting my daily responsibilities?
- \_\_\_\_\_ 27. How much of a problem do I have in controlling my temper when something upsets me?
- \_\_\_\_\_ 28. How much of a problem do I have in keeping from being depressed?
- \_\_\_\_\_ 29. How much of a problem do I have in keeping my emotions from affecting my ability to go about the day's activities?
- \_\_\_\_\_ 30. How much of a problem do I have in controlling my laughter?

A little “cerebral” humor



# Workbooks



## Limitations

- Workbook sheets do not improve carryover to real life settings
- Therapist cannot “grade” task to level of client
- Task may be over-structured, thereby minimizing attentional and executive function deficits

## Points to Remember

- The therapy task is NOT the most important part of the therapy session
- Therapy tasks should be considered only the medium for addressing cognitive deficits
- Rote drills have not been found to be effective in carryover to everyday life
- Pre-teaching sets up expectations for the patient and gives relevance of the task to their life

## How to Grade Tasks

- Types and number of cues given (written, verbal, gestural)
- Level of distractions included (radio or TV on, therapy room door open)
- Novel task vs. familiar task
- Set-up or pre-organization provided

## Task Grading (Phone Book Task)

### LOW TO MEDIUM

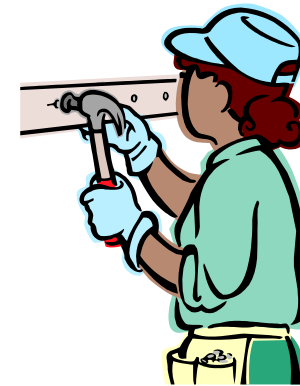
- “Find Mr. Smith’s number on this page and write it down.”
- “Look in the phone book and find the number for Smith’s plumbing so we can call for an estimate.”

### MEDIUM TO HIGH

- “Look up plumbers in this directory and get two quotes.”
- “Our sink is stopped up. What are we going to do?”



# Functional Tasks and Rancho Levels



## Level IV

- Structured therapy is not appropriate
- Patient needs to be able to walk and wander with supervision
- Maintain patient safety
- Establish regular routines
- Rest breaks built into schedule
- Re-direct and use techniques to de-escalate patient as needed

## Levels V, VI

- Roll/fold towels
- Sort seed packets for garden
- Sort condiment packages in dining room
- Roll plastic ware in napkins
- Sort and roll coins
- Stuff envelopes
- Sort fishing tackle (no hooks!) in tackle box
- Sort pictures of food items in recipe box

## Levels VII, VIII

- Pass out schedules
- Pick up and sort mail from mailroom
- Organize family photo album
- Put together patient care kits
- Follow a recipe that has to be doubled
- Organize Rolodex cards
- Hostess Cart
- Take phone messages at desk

## Levels IX, X

- Internet search about topic and make presentation
- Plan seasonal garden and organize project
- Official “greeter”, orientation of new patients
- Plan week’s menu and grocery list
- Set up weekly home schedule

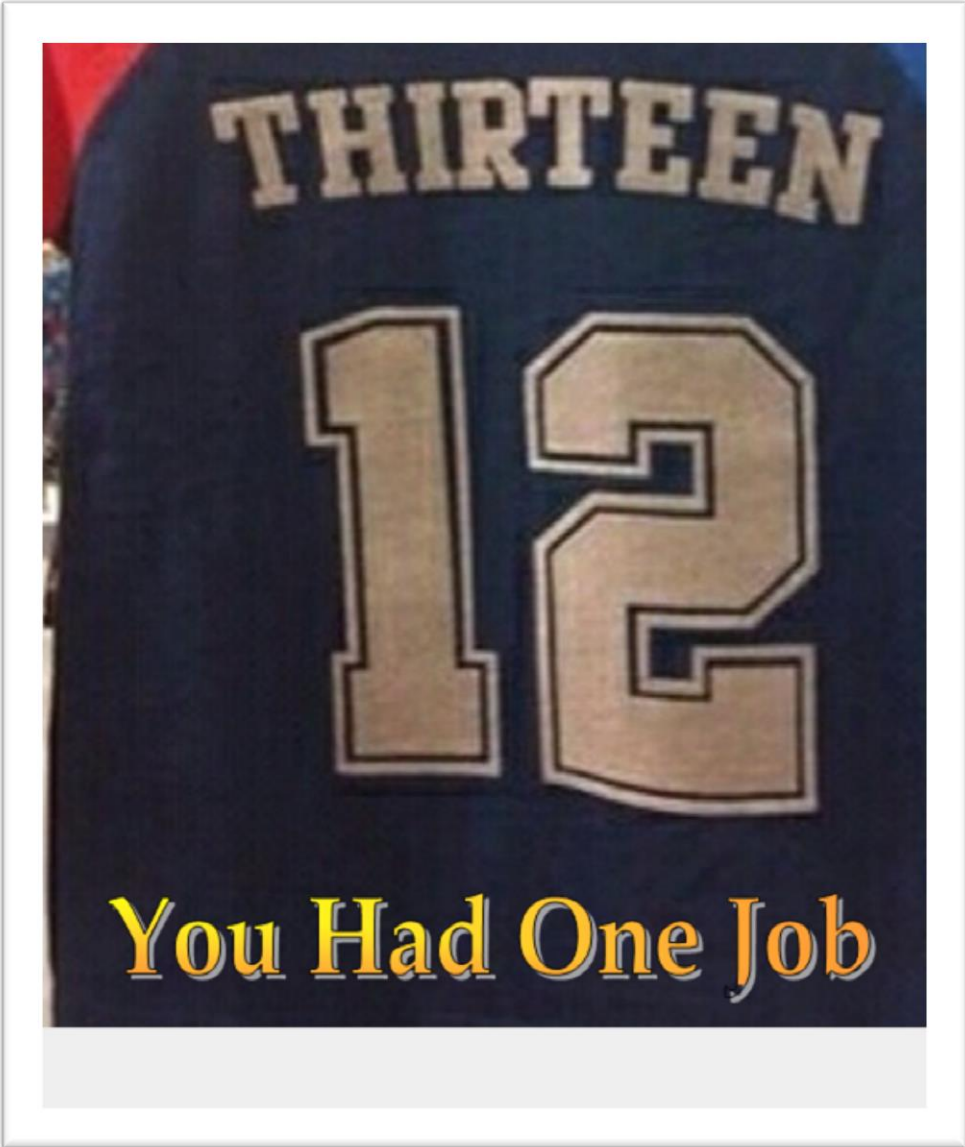
## “Rainy Day File” on a Shoestring

- Job applications from various businesses
- Mail order catalogs
- Parts book from auto store
- Order forms
- Cartoon strips, laminated and cut out
- Dear Annie letters
- Coupons from Sunday paper
- Local and state maps
- Seed packets (vegetables, fruits)

## Coin Sort and Rolling



- Sustained attention
- Selective attention
- Money management
- Can easily grade task

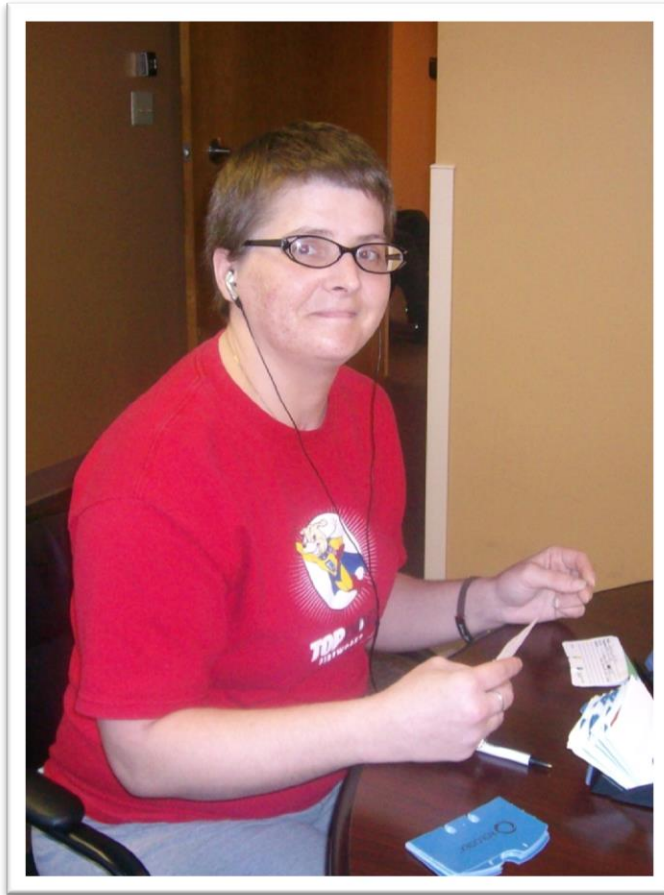




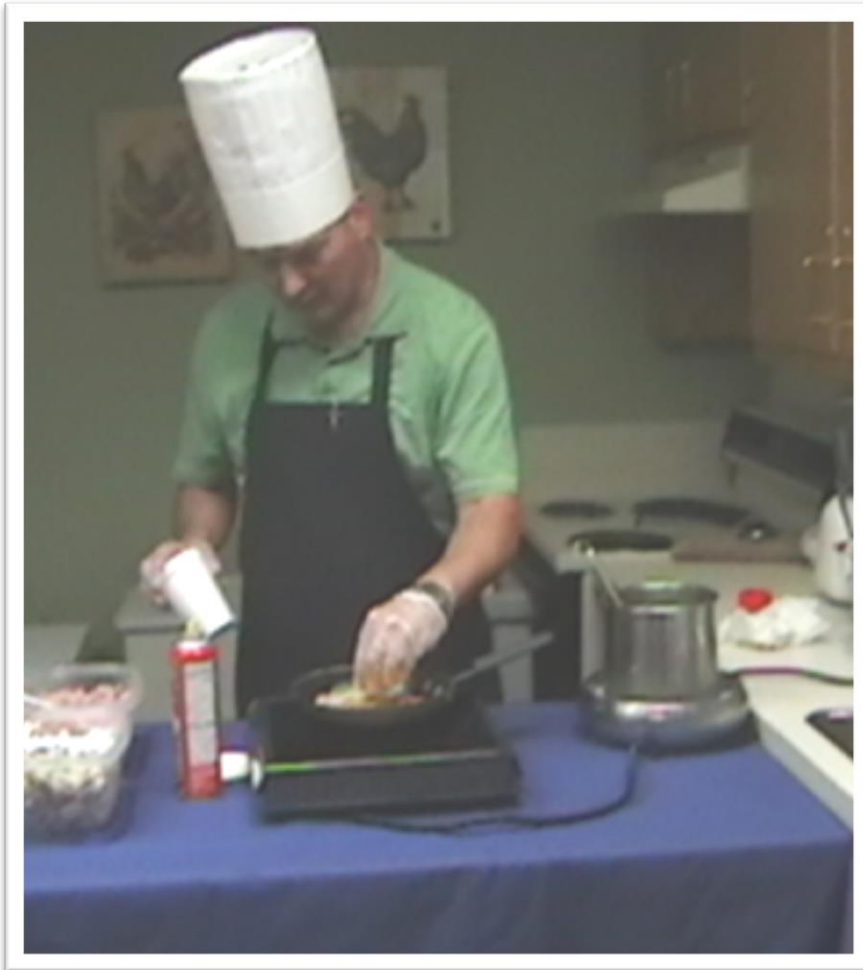


## Organizing Rolodex

- Reading skills
- Writing skills
- Sustained attention
- Alternating attention
- Categorization



## Omelets to Order



- Auditory processing
- Immediate recall
- Procedural learning
- Expressive language

## Can Recycling



- Sustained Attention
- Selective Attention (crush only the Dr. Pepper cans)
- Problem-Solving
- Math, budgeting
- Following written directions

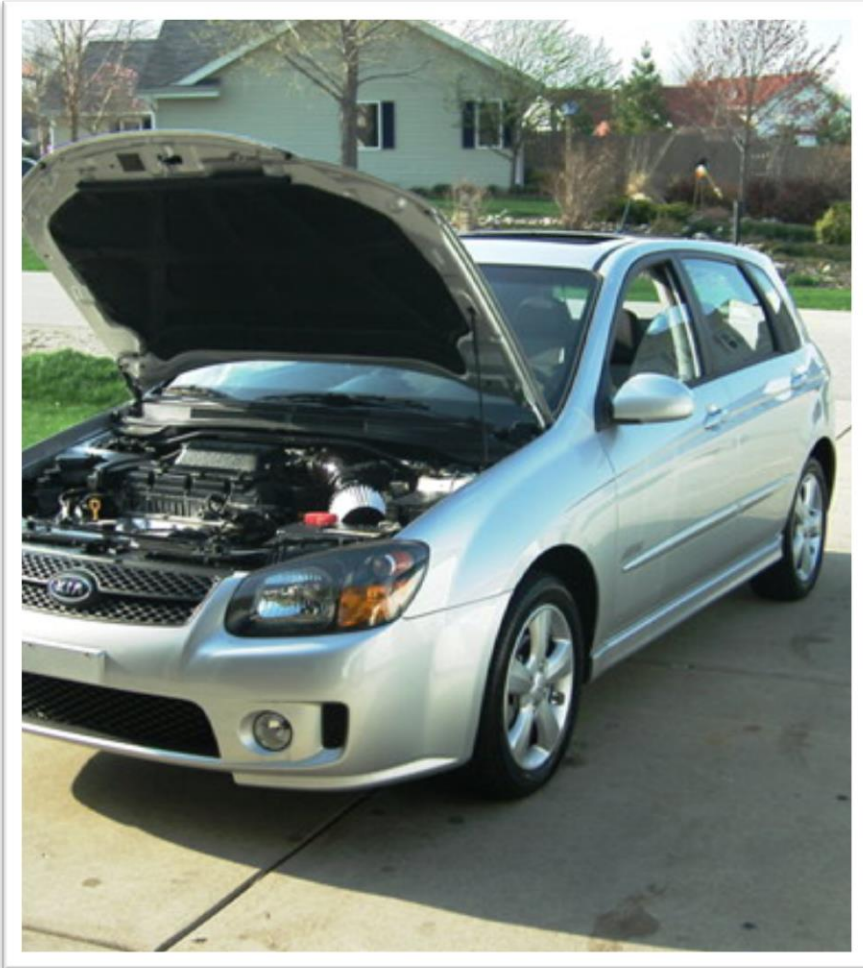
## Bracelet Sale



- Sustained Attention
- Selective Attention
- Organization skills
- Social Interaction
- Planning, budgeting



## Car Care



- Sustained Attention
- Procedural learning
- Organizational skills
- Planning
- Money Management

## Monthly Checklist for Vehicles

- Check battery cables, clamps, and terminals.
- Check the oil. Add oil if necessary.
- Check the coolant level. Add antifreeze and water if necessary.
- Check the brake fluid level. Add brake fluid if necessary.
- Check the power steering fluid level.
- Check the clutch reservoir (if applicable to your car). Add brake if low.
- Check the automatic transmission fluid (if applicable to your car). Add ATF if low.
- Check the windshield washer fluid reservoir. Fill as needed.
- Check belts for cracks, age, and proper tension.
- Check hoses for leakage, cracks, or other signs of age.
- Visually inspect the engine for any leaks.
- Look under the car for any indication of leaks from the engine.
- Check the pressure on all the tires, including the spare.
- Check tire tread depth. Visually inspect the tires for uneven wear, nails, or other sharp objects lodged in the tread.
- Check the dash lights for proper orientation.

## Development of Functional Tasks

- Rancho Level
- Premorbid Interests
- Discharge Setting (home, work, school)
- Skills needed for discharge setting



## Unmet Needs

About 40% of those hospitalized with a TBI had at least one unmet need for services one year after their injury. The most frequent unmet needs were:

*Improving memory and problem solving; Managing stress and emotional upsets; Controlling one's temper; and improving one's job skills.*

Corrigan JD, Whiteneck G, Mellick D. Perceived needs following traumatic brain injury. *Journal of Head Trauma Rehabilitation* 2004;19(3):205-16.

“A brain left to its own devices,  
without facilitation and structure, does  
not move to its highest level.”

-Chris Hagen

## Resources

- BIAA ([www.biausa.org](http://www.biausa.org))
- State Chapters of BIA
- Lash and Associates Publishing ([www.lapublishing.com](http://www.lapublishing.com))
- National Resource Center for TBI
- DVBIC-Defense and Veterans Brain Injury Center
- Center for Outcome Measurement in Brain Injury (COMBI) [www.tbims.org/combi](http://www.tbims.org/combi)

## References

- Baddeley, A.D., & Hitch, G. (1974). Working Memory. In G.A. Bower (Ed.), *The psychology of learning and motivation: Vol. 8* (p. 47-89). New York Academic Press.
- Crosson, B., Barco, P.P., Velezo, C.A., Bolesta, N.M., Cooper, P.V., Werts, D., & Brobeck, T. C. (1989). Awareness of compensation in postacute head injury rehabilitation. *Journal of Head Trauma Rehabilitation*, 4(3), 46-54.
- Corrigan JD, Whiteneck G, Mellick D. (2004). Perceived needs following traumatic brain injury. *Journal of Head Trauma Rehabilitation*, 19(3) 205-216.
- Hagen, C. *The Revised Rancho Levels of Cognitive Function*, 1997.

## References

- Hagen, C. A Team Approach to Rehabilitation Based on the Revised Rancho Levels of Cognitive Functioning. Workshop handout (2008).
- Hart, T. (2000). The Patient Competency Rating Scale. *The Center for Outcome Measurement in Brain Injury*. <http://www.tbims.org/combi/pcrs> ( accessed March 12, 2009).
- Squire, L.R. (1992). Declarative and non-declarative memory. Multiple brain systems supporting learning and memory. *Journal of Cognitive Neuroscience*, 4, 232-43.
- Tulving, E. (1985). How many memory systems are there? *American Psychologist*, 40, 385-396.