Grey Matters: The Principles of Brain Tumor Management - Neuropsychology

Angela Gleason, PhD, ABPP
Clinical Neuropsychologist
Adjunct Assistant Professor
agleason@nebraskamed.com
402-559-5031

I have no disclosures

Objective

Identify patient, disease, and treatment factors related to cognitive impairment in patients with brain tumors.

Identify indications for referral to neuropsychology in the treatment of a patient with a brain tumor.

What is Neuropsychology?

Neuropsychology = The study of Brain-Behavioral relationships

A typical neuropsychological evaluation may assess the following areas:

1. Attention and Working Memory
2. Learning and Memory
3. Language
4. Visuospatial abilities
5. Executive Processing & Higher level reasoning
6. Motor & Sensory Functioning
7. Intellect & and estimate of prior functioning
8. Academic Achievement
9. Motivation, Effort
10. Mood and Personality

http://www.nccn.org/professionals/physician_gls/pdf/cns.pdf

What is involved in a Neuropsychological evaluation?

- Detailed neurobehavioral history
- Clinical observation
- Objective testing
  - Cognitive, neurobehavioral, personality, emotional
  - Consideration of the pattern of strengths and weaknesses
- Diagnostic impression
- Treatment recommendations
- Physician consultation

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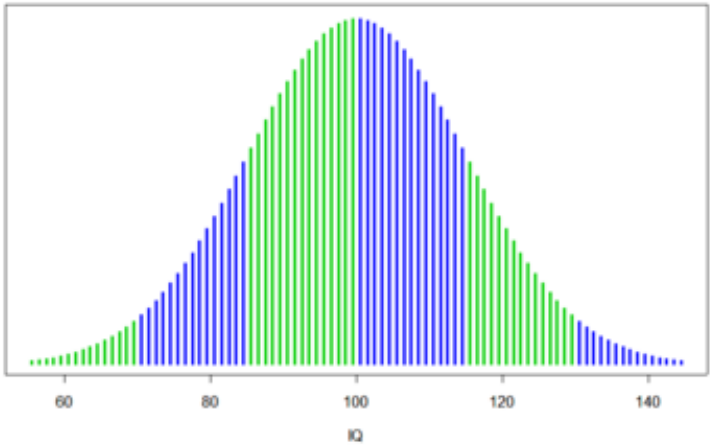
Interpretation of Neuropsychological performance

Test performance is considered quantitatively and qualitatively

- Inter & Intra individual differences
- Norms and deviation
- Pattern of test scores
- Approach to task
- Severity of impairment



- Other important considerations: base rates, psychometrics, quality of norms, ecological validity, circumstantial factors

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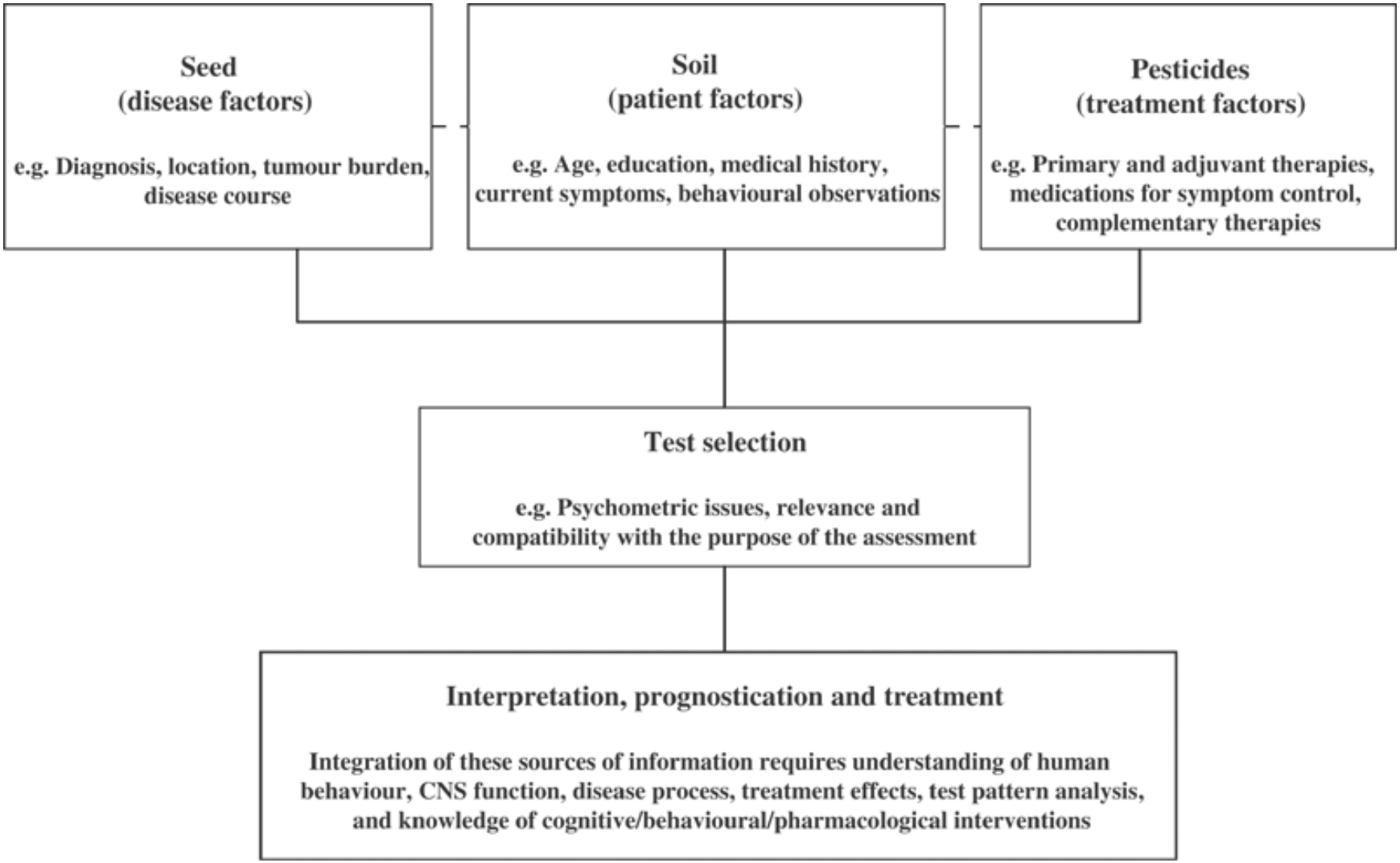
Factors Impacting Neuropsychological performance



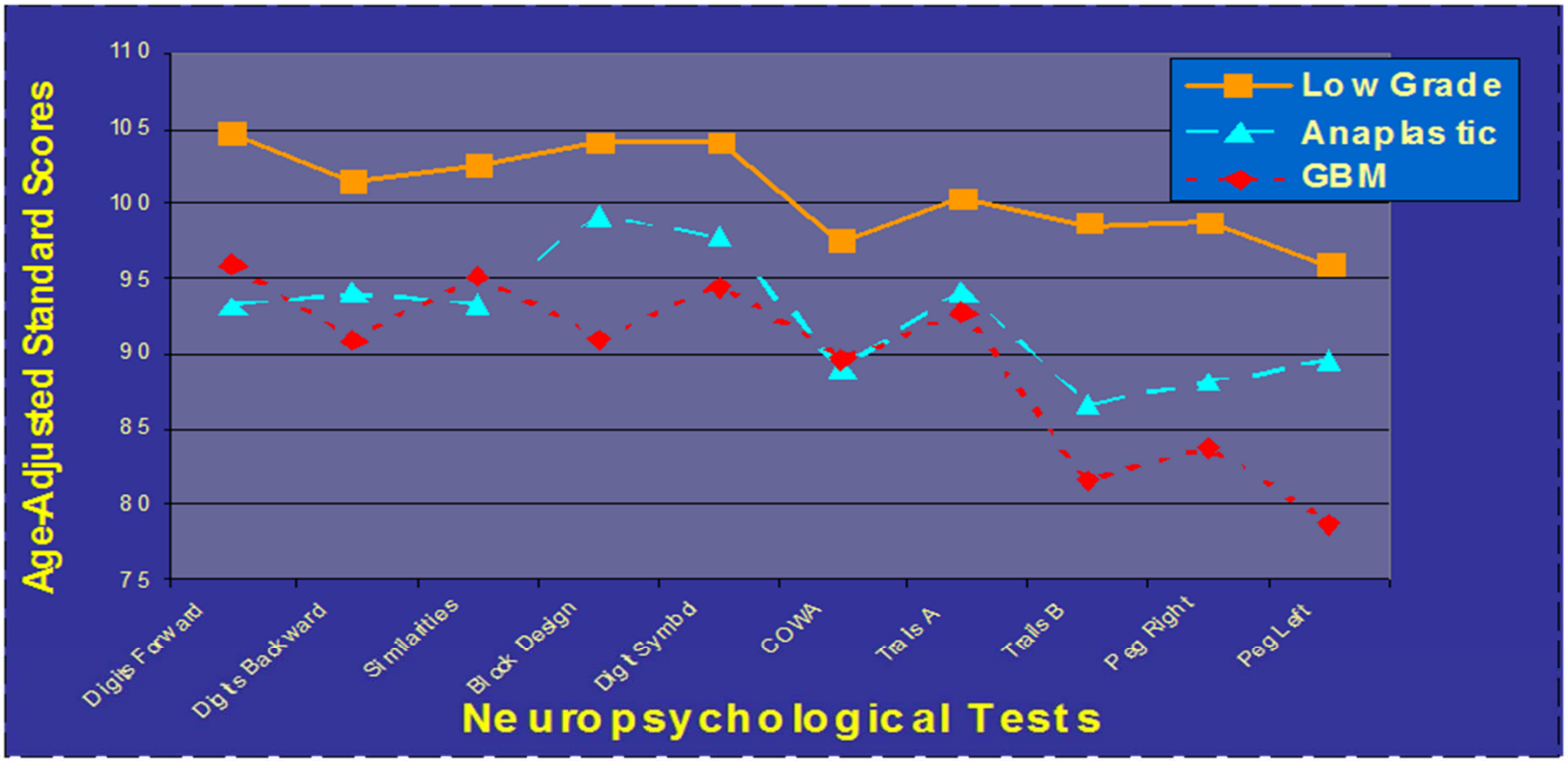
Wefel, Kayl, Meyer, 2004

Factors Impacting Neuropsychological performance

- Tumor effects
  - Lesion location
  - laterality
  - Tumor grade
  - Tumor burden (e.g., size)
  - Disease course
  - Tumor-related epilepsy
- Treatment effects
  - Surgery
  - Radiation
  - Chemotherapy
  - Medications (e.g., anti-seizure meds, steroids)

Factors Impacting Neuropsychological performance

Tumor Grade: High-grade tumors (grades III and IV) are associated with lower pre-operative cognitive performance than low-grade tumors (grade II).



Gleason AC and Meyers CA, 2002

Neuropsychological Test Performance and Tumor Grade

Surgery

- Post-surgery focal cognitive deficits, no significant difference by tumor grade. (Scheibel et al, 1996)

Chemotherapy

- Diffuse cognitive deficits in 15-50% of patients receiving chemo (Vardy et al 2007)
- Acute encephalopathy vs. chronic encephalopathy

Radiotherapy

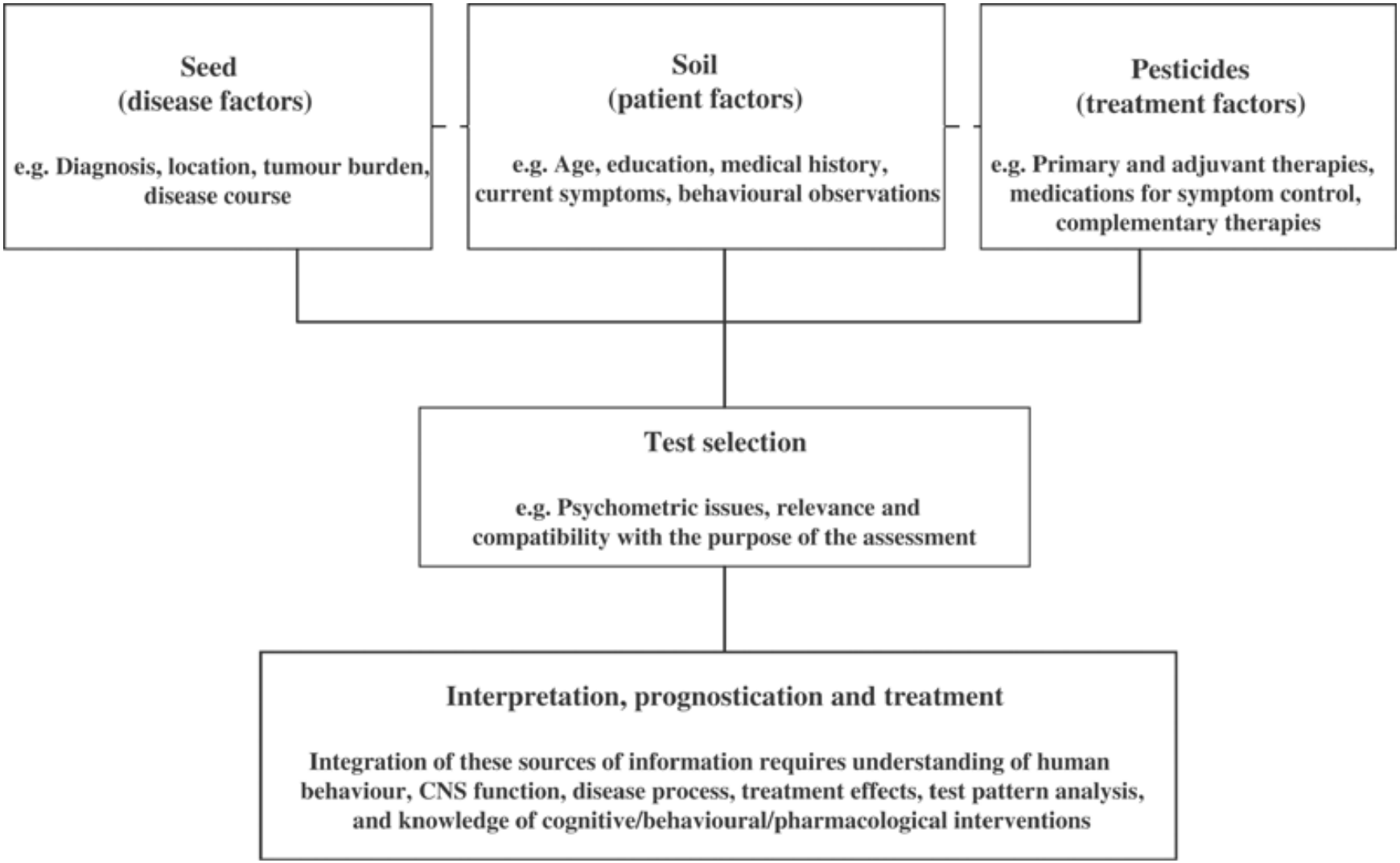
- Acute, early-delayed, late-delayed encephalopathy
- Incidence estimates vary 0-86% (Wefel et al 2004)
- Toxicity of radiation likely synergistic w/ concurrent chemo
- memory impairment in patients who received fraction doses > 2 Gy. (Klein et al 2002)

Factors Impacting Neuropsychological performance

Patient Factors

- Age
- Premorbid intellect
- Education
- Sociocultural background
- Occupational achievement
- English 1° vs 2° language
- Handedness
- Sex/Gender
- Mood / emotion
- Fatigue / sleep
- Medication effects
- Pain, headache, nausea, discomfort
- History/current substance or alcohol abuse
- Other medical history (e.g., TBI, cerebrovascular risk factors, sleep apnea)

Factors Impacting Neuropsychological performance



Wefel, Kayl, Meyer, 2004

Indications for Neuropsychology Referral

- Establish baseline
- Assist with Surgical / Treatment Planning
  - Pattern of cognitive deficits/ intact functions
  - Lateralize/localize cognitive functions and/or dysfunction
- Evaluating post-treatment change
  - Safety, decisional capacity & questions of independence (e.g., supervision, POAHC)
  - Return to work or school accommodations
  - Counseling / education of spouse, family members
- Research

Thank you!

www.nebraskamed.com/brainandspinecancercenter

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