Memory and Medical Mnemonics

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History of Mnemonics
Rise and Fall of Mnemonics
Moonwalking with Einstein

- US and World Memory Championships
- Playing cards
- Poem
- Strangers with 10 bits of information
- 100 names and faces
- Digit recall
- Random words
Memory – Foundations and Applications

- Bennett Schwartz, PhD
- Professor of Psychology
- Florida International University
- Course instructor
Memory Physiology

• Working (short term) memory
  • 30 seconds
  • Seven bits of information
  • Reading a book, following this lecture
  • Impaired in Alzheimer’s and ADHD

• Long term memory
  • Requires changes in brain cells
  • Encoding, rehearsal, and retrieval
  • 60% gone within 30 minutes
Memory Physiology

Anatomy of the Brain

- Frontal lobe
- Parietal lobe
- Occipital lobe
- Temporal lobe
- Pons
- Medulla oblongata
- Cerebellum
- Limbic System
  - Thalamus
  - Cingulate gyrus
  - Fornix
  - Amygdala
  - Hippocampus
  - Parahippocampal gyrus
Mnemonics and Mnemonists

- Mnemonic - Any learning device that enhances information retention
- Mnemonist – person with extraordinary memory mostly achieved through various techniques and practice
- Alex Mullen – memorized a deck of playing cards in < 20 seconds and 3000 digits in less than an hour.
Science of Memory – Four Principles

- Process what you are learning for meaning
- Practice retrieval of memories
- Use your own metamemory, the awareness of your own memory processes
- Distribute your learning effort
Process for Meaning

- Disorganized outlines requiring student reorganization are more effective learning devices than clean, clear outlines

- **Use auditory and visual mnemonics to facilitate retention of facts**

- Multitasking and distractions are the enemy of learning
Practice Good Retrieval Techniques

- Testing yourself is far more effective than rereading material
- Flashcards are highly effective
- Study under variable mental and physical conditions to help recall information
- When retrieval conditions meet encoding conditions, recall will be maximal
Beware of Metamemory Mistakes

- Human mind overestimates memory
  - We underestimate our own forgetting and future remembering
  - Study items you think you already know
  - Review critical lecture materials intermittently
  - Learning styles are bogus

- Region of proximal learning
  - Apply study especially to the easiest of items just beyond what you have already mastered
  - Study the most difficult items only if ample time
Avoid Massed Practice

- Massed practice (cramming) helps short-term but not long term memory
- Distributed practice increases long-term learning
- Distributed practice less satisfying than cramming (another metamemory trick)

You can get a great deal from rehearsal
If it just has the proper dispersal
You would just be an ass
To do it en masse
Your remembering would turn out much worsal.
Reasons for Medical Mnemonics

- Simplest memory system available
- Time saving
- Useful teaching device
- Better health care
  - FAST
  - COVERABCD

**Stroke – there’s treatment if you act FAST.**

- Face
  - Look uneven?
- Arm
  - One arm hanging down?
- Speech
  - Slurred speech?
- Time
  - Call 911 NOW!
Types of Medical Mnemonics

Acronyms

- An abbreviation or word formed from the initial letters of a list
- Lay example – HOMES
- Medical example SLUDGE
  - Salivation
  - Lacrimation
  - Urination
  - Defecation
  - GI upset
  - Emesis
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Types of Medical Mnemonics

Acrostics

- Initial letter of a series of words generate a list
- Lay example – *Kids Prefer Cheese Over Fried Green Spinach*
- Medical example –
  - *Bacon*
  - *Lettuce*
  - *Tomato*
  - *Ketchup*
  - *Pickle*
  - *Mayonnaise*
  - *Mustard*
Types of Medical Mnemonics

Acrostics

- Initial letter of a series of words generate a list
- Lay example – Kids Prefer Cheese Over Fried Green Spinach
- Medical example – tumors metastasizing to bone
  - Bacon - Breast
  - Lettuce - Lung
  - Tomato - Thyroid
  - Ketchup - Kidney
  - Pickle - Prostate
  - Mayonnaise – Multiple Myeloma
  - Mustard - Melanoma
Types of Medical Mnemonics

Visual

- Lay example
- Medical example
Causes of Splenomegaly

- Inflammatory
- Infectious
- Malignancy
- Congestive – CHF and Cirrhosis
- Collagen Vascular
- Hemolysis
Visual Mnemonic for Splenomegaly
<table>
<thead>
<tr>
<th>Kinesthetic Mnemonic for Pancreatitis Stages</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Hand Gesture]</td>
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</tbody>
</table>
Creation of Medical Mnemonics

- Choose hard to remember list of diagnoses or treatments
- Use a working memory associative hook for retrieval
- Consider an on-line Scrabble dictionary
- Use synonyms to assist construction—e.g., malignancy, neoplasm, cancer; drugs and medications
- The more bizarre and the more visual, the better
- Experiment on an unsuspected learners
- Review every 3-6 months to retain in memory; your own creations seem easier to remember
- Review every 2-3 years for accuracy
Clubbing of the Fingers

- Congenital, cystic fibrosis cirrhosis, congenital HD
- Lung abscess
- Ulcerative colitis
- Brachial AV fistula
- Bronchiectasis
- Infectious endocarditis
  Interstitial lung disease
- Neoplasia (cancer)
- Graves’ disease
Causes of Acute Pancreatitis

- Infections – mumps
- Gallstones
- Ethanol
- Trauma, Triglycerides
- Surgery
- Malignancy
- Autoimmune
- Scorpion sting
- Hypercalcemia
- ERCP
- Drugs
Example of Mnemonic Creation

Indications for statin therapy – 2013 AHA guidelines

- Adults ≥21 years of age with primary LDL–C ≥190 mg/dL should be treated with statin therapy.
- Moderate-intensity statin therapy should be initiated or continued for adults 40 to 75 years of age with diabetes mellitus.
- Adults 40 to 75 years of age with LDL–C 70 to 189 mg/dL, without clinical ASCVD* or diabetes and an estimated 10-year ASCVD risk ≥7.5% should be treated with moderate- to high-intensity statin therapy.
- High-intensity statin therapy should be initiated or continued as first-line therapy in women and men ≤75 years of age who have clinical ASCVD*, unless contraindicated.
Example of Mnemonic Creation
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Medical Acronym Mnemonic
When to Start a Statin

- **L** – LDL > 190
- **A** – Atherosclerotic disease
- **R** – 10-year risk of > 7.5%
- **D** – diabetes present

http://tools.cardiosource.org/ASCVD-Risk-Estimator/
Stensen’s and Wharton’s Ducts

- Easy to remember the eponyms
- Hard to remember location
- Hard to remember drainage patterns
- Thoughts?
Mnemonic for Salivary Ducts

- **Stenson’s** – think “S” for second molar and smokeless tobacco (between check and gum). Logically drains the parotid gland.

- **Wharton’s** – think “W” for Wet Willie (requires finger against tongue to initiate). Logically drains the submandibular and sublingual glands.
Why Bother With Mnemonics

- Fund of knowledge is decreasing with external retrieval systems
- Memory is poor when computer-retrieved information is said to be “saved.” Rereading is a much less effective learning device than retesting.
- Chance favors only the prepared mind.
- There is a direct link between memory and creativity.
- Foer: Memory is like a spiderweb that catches new information. The more it catches, the bigger it grows. And the bigger it grows, the more it catches.
Only God Creates Ex Nihilo
References