Need for Speech-Language Pathology (SLP) Services

- SLP scope of practice
  - Extends beyond dysphagia
  - Assessment and treatment of:
    - Communication disorders
      - Motor speech and voice
      - Language
      - **Communication problems contribute to both problematic behavior and caregiver burden (Watson et al., 2012)**
    - Cognitive disorders
      - Memory
      - Attention
      - Executive functions
Examples of Cognitive-Communicative Profiles in Dementing Diseases

- **Alzheimer’s disease**
  - Early/primary deficit areas *(Murray, 2010; Taler & Phillips, 2008; Scheltens et al., 2015)*

- **Vascular dementia**
  - Language profile dependent on lesion locations *(Calabro et al., 2015; Wetzel & Kramer, 2008)*

- **Subcortical dementing diseases**
  - e.g., Parkinson’s disease *(Murray, 2008; Murray & Rutledge, 2014)*
    - Syntax and reading comprehension problems
    - Decreased informativeness
  - e.g., Huntington’s disease *(Murray & Lenz, 2001; Murray & Stout, 1999)*

Examples of Cognitive-Communicative Profiles in Dementing Diseases

- **Frontotemporal lobar degeneration** *(Anand et al., 2009; Chare et al., 2014; Harciarek et al., 2014)*
  - Dysexecutive/social disorder
  - Semantic dementia (SD) or semantic variant progressive aphasia
  - Progressive nonfluent/agrammatic aphasia (nfv-PPA)
  - Logopenic variant primary progressive aphasia (lv-PPA)
  - Corticobasal syndrome
    - Early/primary deficit areas
      - Limb apraxia
      - Visuospatial processing and visuoconstruction deficits
      - Executive dysfunction
Mild Cognitive Impairment (MCI)

- **MCI criteria** (Faucounau et al., 2010; Ries et al., 2007)
  - Does not fulfill DSM-IV dementia criteria
  - Cognitive problems
  - Preserved ADLs and nominal problems with IADLs

- **MCI statistics** (Alzheimer’s Association, 2014)
  - 10-20% of individuals ≥ 65 yr
  - About 15% of those with MCI convert to AD each year (vs. 1-2% conversion rate in healthy adults)
  - About 50% who visit doctor regarding MCI symptoms convert to dementia diagnosis in 3-4 years

- **Highly variable cognitive profiles** (Aretouli & Brandt, 2010; Krueger et al., 2011; Libon et al., 2010; Reinvang et al., 2012; Springate & Tremont, 2012)

Dementia Protective Factors Include (Bennett et al., 2014; Kempler & Goral, 2008; Lopez, 2011):

- Early diagnosis and treatment of vascular disorders
- Establishing and maintaining a rich social network
- Keeping intellectually and physically active

- **Therefore, cognitive-communicative behavioral treatment approaches should help slow rate of decline!**
Therapeutic Nihilism

Case example

Some depressing statistics
- Mean of 65 min/day of skilled therapy (combined across disciplines) for patients with sub-acute conditions

However:
- Centers for Medicare and Medicaid Services (2001):
  - “Through the course of their disease, patients with dementia may benefit from pharmacologic, physical, occupational, speech-language, and other therapies.”
- Nonpharmacologic treatments are part of guideline recommendations
  - National and international professional and government organizations (e.g., American Psychiatric Association, American Academy of Neurology, NIH and Clinical Excellence, United Kingdom Dept. of Health) (Geldmacher & Kerwin, 2013; Giebel & Challis, 2014; NICE, 2006)

Barriers (Geldmacher & Kerwin, 2013)

- Primary care physicians in US report barriers regarding their role in managing dementia cases such as:
  - Lack of time
  - Negative perception with respect to importance of early diagnosis
  - Difficulty managing behavior and other problems in dementia
  - Lack of connections with community service agencies
Memory Strategies

- Internal Memory Strategies
  - e.g., visual imagery, association, alphabet cueing
  - Useful for MCI patients only, particularly if (Hampstead et al., 2008; Stott & Spector, 2010):
    - Sufficiently long training
    - Focus training on only 1 strategy
    - Train strategy specific to type of info they are trying to retain

- Low and high tech external memory strategies
  - Specific vs. variety of settings
  - Useful for broader dementia population

Outcomes:
- Patients with MCI benefit from external memory strategies (Bourgeois, 2013; Giebel & Challis, 2014; Hampstead et al., 2008; Stott & Spector, 2011)
- Mild-moderate dementia patients benefit from external strategies (De Leo et al., 2011; Imbeault et al., 2014; Nugent et al., 2011; Schmitter-Edgecombe et al., 2008; Yasuda et al., 2009, 2013)
  - Most research on memory books and smart phones
Memory Strategies

◆ Must **explicitly** train external device and strategy use (Mateer, 2009; Singer & Bashir, 1999; Sohlberg et al., 2007; Murray & Clark, 2015)

☐ Requires systematic instruction
  ◆ Acquisition
    ■ how to use strategy
    ■ often taught via errorless learning
  ◆ Application
    ■ what strategy can do
  ◆ Adaptation
    ■ when, where, and with whom to use

Memory Strategies

◆ **Factors influencing device/strategy use** (DePompei et al., 2008; O’Connell et al., 2003)
  ☐ Patient motivation
  ☐ Sensory and motor issues
    ◆ e.g., visual or auditory impairments
    ◆ e.g., intention tremor or paresis
  ☐ Familiarity with technology
  ☐ Selection of features to motivate
  ☐ Support for programming and troubleshooting
**Intensive/Cognitive-Linguistic Stimulation**

- **Across studies** (Bourgeois, 2013; Chapman et al., 2004; Ciancarelli et al., 2010; Ciro et al., 2014; Clare et al., 2010; Farina et al., 2006; Faucounau et al., 2010; Hoffman et al., 2015; Matsuda et al., 2010; Murray et al., 2015; Orrell et al., 2005; Sitzer et al., 2006; Spector et al., 2010; Tesar et al., 2005; Treiber et al., 2011; Viola et al., 2011; Yi-Xuan et al., 2010)
  - Involved patients with mild to moderate dementia
  - Included MCI, AD, FTD, VaD, MS, PD, mixed, and unspecified
  - Protocol variation examples
    - Caregiver vs. healthcare professional
    - Individual vs. group sessions
    - Do vs. don’t include activities from other approaches
    - Target 1 vs. multiple cognitive-linguistic skills
    - Number, length, and frequency of sessions

- **Intensive/Cognitive-Linguistic Stimulation**

  - **Outcomes across studies** (Chapman et al., 2004; Ciancarelli et al., 2010; Clare et al., 2010; Faucounau et al., 2010; Hindle et al., 2013; Hoffman et al., 2015; Matsuda et al., 2010; Murray et al., 2015; Orrell et al., 2005; Sitzer et al., 2006; Spector et al., 2003, 2010; Tesar et al., 2005)
    - ↑ attention, memory, executive function, language, ADL skills
    - ↓ patient neuropsychiatric problems and caregiver depression and distress
    - ↑ patient and caregiver QOL and perceptions of general functioning ratings
    - ↑ brain activation
    - > outcomes in cognitive-linguistic stimulation + donepezil vs. donepezil alone (Chapman et al., 2004; Matsuda et al., 2010; Rozzini et al., 2007)
    - Effects typically maintained 4.5 months post-tx (Sitzer et al., 2006)
### Montessori-Based Intervention

#### Principles of Montessori approach
(Camp, 2010; Livingston et al., 2005; Mahendra et al., 2006)
- Take place in prepared environment
- Progress from simple/concrete to complex/abstract
- Break task/activity into its parts
  - Train each part sequentially with cues to minimize errors and maximize success
- Progress from observation and recognition to recall and demonstration
- Use real-life materials and daily activities/contexts
- Emphasize all sensory modalities
- Work at one’s own pace
- Individual or group sessions

#### Montessori-Based Intervention
- Session number, length, and frequency have varied
  - 25-60 min sessions; twice daily-twice weekly; 3-9 months
- Example activities
  - Memory Bingo
  - Question Asking Reading on common topics
  - Sensory activities
  - Abstract activities
  - ADLs and IADLs
  - Intergenerational activities
Montessori-Based Intervention

- Variety of dementia types ranging from mild to severe
  - AD, VaD, mixed
- Outcomes across studies (Camp et al., 1997; Giroux et al., 2010; Gozali & Jarrott, 2002; Judge et al., 2000; Lee et al., 2007; Lin et al., 2010; Orsulic-Jeras et al., 2000; Pampano et al., 2001; Skrajner & Camp, 2007; van der Ploeg & O’Connor, 2010; van der Ploeg et al., 2013):
  - Active/task engagement, positive affect/pleasure, functional status, social interaction, independent task completion
  - Passive/no engagement, negative affect, eating difficulty, repetitive vocalizations, apathy, confusion, aggression, agitation

Reminiscence Therapy

- Rationale (Kim et al., 2006; Lazar et al., 2014; O’Shea et al., 2011; Wang, 2007)
  - Retrograde memory may be less degraded
  - Reminiscence involves all cognitive-linguistic domains
- Used with:
  - Various dementia types and severities
- Procedures involve:
  - Typically group format
    - In person or telerehab
  - Focus on one theme or topic per session
  - Utilize props, pictures, objects, music, video clips and games to trigger memory/discussion
Reminiscence Therapy

- e.g., StoryCorps (http://www.storycorps.org)
  - National nonprofit organization that records and preserves stories of everyday people (Ball, 2011)
  - Memory Loss Initiative

Reminiscence Therapy

- Outcomes across studies (Akanuma et al., 2011; Chiang et al., 2010; Cotelli et al., 2012; Davis et al., 2012; Hsieh et al., 2010; Jo & Song, 2015; Lazar et al., 2014; Nawate et al., 2008; Shik et al., 2009; Su et al., 2013; Wang et al., 2009; Yamagami et al., 2007; Yasuda et al., 2009; 2013)
  - ↓ depression, agitated behaviors, apathy, social isolation
  - ↑ in a variety of areas:
    - arousal
    - cognitive skills including attention and immediate and delayed recall
    - cingulate activation
    - overall well being
    - amount of verbal output
    - QoL/self-worth
    - social skills/friendships
Implicit Memory Approaches

- **Implicit memory/learning** (Bayles & Kim, 2003; Knowlton & Foerde, 2008)
  - Nondeclarative memory/learning/recall that can be achieved without awareness or effort
  - Includes priming, habitual/procedural memory
  - Associated with caudate and other basal ganglia structures and cerebellum
  - Utilized with variety of dementia severities and types

Implicit Memory Approaches

- **Spaced retrieval** (Balota et al., 2006; Bourgeois et al., 2003; Bourgeois & Melton, 2004; Brush & Camp, 1998; Cherry et al., 2010; Giebel & Challis, 2014; Hopper et al., 2004, 2010; Lee et al., 2009; Wu et al., 2014)
  - Recall information over progressively longer intervals
  - Target behaviors have included:
    - important names (i.e., face-name associations)
    - use of compensatory techniques
    - motor transfer techniques
    - room number and location
  - Appropriate for mild to severe dementia
  - In person and phone intervention
  - Outcomes across studies:
    - recall of target info or skill
    - No generalization
Implicit Memory Approaches

- **Errorless learning** (Avila et al., 2004; Clare, 2001; Clare & Jones, 2008; Dechamps et al., 2011; Dunn & Clare, 2007; Gonzalez Rothi et al., 2009; Jokel et al., 2010; Page et al., 2006; Wu et al., 2014)
  - Cue or break down tasks into discrete steps so client never makes a recall error
  - Target behaviors have included:
    - Face/name associations
    - Word list learning
    - ADLs (e.g., food prep; eating behaviors)
    - External strategy use
  - Used with MCI and AD, FTLD, and VaD of various severities

- **Errorless learning outcomes across studies** (Avila et al., 2004; Clare, 2001; Clare & Jones, 2008; Dechamps et al., 2011; Dunn & Clare, 2007; Gonzalez Rothi et al., 2009; Jokel et al., 2010; Page et al., 2006; Wu et al., 2014)
  - ↑ in trained skill/content only
  - Outcomes may vary across patients
  - Inconsistent findings regarding benefits of errorless vs. effortful learning
    - > effortful learning (e.g., Dechamps et al., 2011; Jokel et al., 2010)
    - Same as effortful learning (e.g., Dunn & Clare, 2007; Haslam et al., 2006)
  - Often applied in concert with spaced retrieval (e.g., Lowenstein et al., 2004; Wu et al., 2014)
Holistic/Alternative Approaches

- **Sensory stimulation approaches** (Anderson et al., 2011; Bradt et al., 2010; Camberg et al., 1999; Chung & Lai, 2009; Fowler, 2008; Kverno et al., 2009; Livingston et al., 2005; Materne et al., 2014; Milev et al., 2008; Murray et al., 2003; Riley-Doucet, 2009; Yasuda et al., 2009)
  - **Rationale**
    - Dementia patients suffer from sensory/perceptual deterioration due to:
      - Normal aging effects
      - Disease effects
      - Sensory deprived environments
    - Sensory deprivation leads to:
      - Disruptive behaviors
      - General confusion
      - Cognitive decline
      - Psychiatric disorder
  - Appropriate for all dementia severities
  - Session number and duration varied

- **Types**
  - Pet therapy
  - Toy stimulation
  - Music therapy
  - Light therapy
  - Snoezelen
  - Simulated presence (Camberg et al., 1999; Cohen, 2000; Lund et al., 1995; Yasuda et al., 2009)
Holistic/Alternative Approaches

- **Sensory stimulation approaches** (Anderiesen et al., 2014; Anderson et al., 2011; Bradt et al., 2010; Chung & Lai, 2009; Fowler, 2008; Krishnamoorthy & Craufurd, 2011; Kverno et al., 2009; Livingston et al., 2005; Materne et al., 2014; Milev et al., 2008; Murray et al., 2003; Riley-Doucet, 2009; Yasuda et al., 2009)

  - Outcomes across studies
    - *↑* primarily while doing the activity
    - *↑* in a variety of areas:
      - *↑* disruptive behaviors, agitation, apathy

- **Movement/exercise therapy** (Cott et al., 2002; de Carvalho Bastone & Filho, 2004; Hale et al., 2003; Hindle et al., 2013; Roach et al., 2011; Rogalski & Quintana, 2013; Steinberg et al., 2009; Toto et al., 2001; Yu et al., 2006)

  - e.g., yoga, dance activities, walking, recumbent bike, ROM and balance exercises, strength/weight training
  - Often used in concert with cognitive training
  - Used with variety of dementia types and severities
Holistic/Alternative Approaches

- **Movement/exercise therapy** (Cott et al., 2002; de Carvalho Bastone & Filho, 2004; Hale et al., 2003; Harkawik & Coyle, 2012; Hindle et al., 2013; Roach et al., 2011; Rogalski & Quintana, 2013; Steinberg et al., 2009; Toto et al., 2001; Yu et al., 2006)
  - Improvements or slower declines observed in:
    - Physical/cardiovascular functioning
    - Sleep patterns
    - Cognitive skills
    - Emotional well being
    - ADLs and transfers
    - Motor speech

Caregiver Training

- **Family is primary source of caregiving for dementia population** (AA, 2014; Stefanacci et al., 2011)
- **Important component of contextualized rehabilitation** (Sander et al., 2009)
  - Contextualized = tx provided within patient’s daily context
- Provide with educational and counseling resources
  - Family Caregiver Alliance [http://www.caregiver.org](http://www.caregiver.org)
  - FTD Caregiver Support Center [http://ftdsupport.com](http://ftdsupport.com)
  - Harvard Health Publications; e.g., [http://www.helpguide.org/elder/vascular_dementia.htm](http://www.helpguide.org/elder/vascular_dementia.htm)
Caregiver Training

- Must move beyond reading material only
- Assure they understand:
  - rationale for treatment procedures/strategies
  - importance of keeping time for themselves and thus, protecting their own physical and mental health
- Task demand modifications (Catroppa & Anderson, 2006; Kurz et al., 2012; Sohlberg & Mateer, 2001; Murray & Clark, 2015)
- Social Manipulations (Murray & Clark, 2015)
  - Aimed at minimizing learned helplessness
  - Assure dementia patient has social role other that of “dementia patient”

Caregiver Training

- Environmental Accommodations (Anderiesen et al., 2014; Bruce et al., 2013; Brush et al., 2002; Brush & Calkins, 2008; Gitlin et al., 2010; Giovannetti et al., 2007; Livingston et al., 2005; Small et al., 2003; Topo, 2009)
  - Fall within WHO ICF model and SLP scope of practice
  - Keep environment predictable and distraction free
  - Assure adequate visual contrast and lighting
  - Personalization
  - Safety accommodations
  - Consider comfort
  - Pacing strategies (Sohlberg & Mateer, 2001)
  - Organizational systems (Michel & Mateer, 2006)
Caregiver Training

- **Linguistic manipulations** (Haberstroh et al., 2011; Petryk & Hopper, 2009; Small et al., 2003; Small & Perry, 2005, 2012; Watson et al., 2012; Wilson et al., 2012)
  - **Content**
    - e.g., simplify vocabulary; repeat information; open-ended questions that require responses from semantic memory; limit to one proposition/direction/idea; communicate about topics in the present/"here and now"
  - **Structure**
    - e.g., short, simple utterances; one point at a time; cued or forced-choice questions during ADLs; open-ended questions to encourage conversation
  - **Use**
    - e.g., identifying and extinguishing elderspeak, avoid indirect speech acts and figurative language; use alerting cues; speak face-to-face; within a conversation, limit number of partners and allow extra time for processing/responding; incorporate visual aids/contextual support
    - Reduced speech rate may be detrimental
    - Educate on lack of sensitivity

- Caregiver Training

  - Can be trained to administer all direct intervention approaches just reviewed (e.g., Avila et al., 2004; O'Shea et al., 2011; Riley-Doucet, 2009; Steinberg et al., 2009)
    - Training in person and/or telerehab

  - Caregiver training programs described and evaluated in the empirical literature. Examples include:
    - Circle Model (Jansson et al., 1998)
    - TANDEM model (Haberstroh et al., 2011)
Caregiver Training

- Outcomes of across caregiver training studies (Done & Thomas, 2001; Gitlin et al., 2010; Haberstroh et al., 2011; Kuo et al., 2013; Livingston et al., 2005; Marriott et al., 2000; Small & Perry, 2012; Watson et al., 2012)
  - ↓ distress, depression, communication problems between caregiver-patient pairs
  - ↑ emotional well being of caregiver and patient
  - Delay institutionalization of patient
  - ↑ QoL in patients

Combined Approaches

- Consistent positive outcomes among intervention programs that combine two or more of the previously reported approaches (Bourgeois, 2013; Pimental, 2009)
  - e.g., external memory strategies + reminiscence tx + caregiver training (Kurz et al., 2012)
  - e.g., reminiscence tx + art tx + music tx (Jo & Song, 2015)
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