

# DEMENTIA WITH LEWY BODIES

## Information and Intervention Suggestions With an Emphasis on Cognition

Shelly Weaverdyck

---

**This is an adaptation of the handout Caring Sheet #12 from the Michigan Dementia Care Series. More information is at the end of this Handout.**

The Michigan Dementia Care Series can be found on the Michigan website called Improving MI Practices at <https://www.improvingmipractices.org>

**This handout is a brief summary** of information about **Dementia with Lewy Bodies (DLB)**, with an emphasis on cognitive abilities. It suggests some **intervention** strategies.

More intervention strategies are in the **CAIS Handout “#37 Dementia with Lewy Bodies: Interventions”**. See the resources in the next section below for even more intervention suggestions with details and examples.

The information in this handout is intended to **highlight differences** between **Dementia with Lewy Bodies (DLB)** and two other types of dementia: **Alzheimer’s Disease (AD)** and **Frontotemporal Dementia (FTD)**.

### FOR MORE DETAIL AND INTERVENTION STRATEGIES

More information and detail (especially about the brain and cognitive abilities in dementia) and suggestions of interventions (including support strategies) are in:

1. Other **CAIS Handouts** (for example, in **CAIS Handouts #37** about **interventions** for **Dementia with Lewy Bodies**, **#29** about **visual-spatial** interventions, **#34** about **sleep** interventions, **#27** about **touch** interventions, **#28** about **movement** interventions, **#7** and **#8** about **dementia**, and **#32** about **making decisions**). CAIS Handouts **#6**, **#7**, and **#8** also identify specific cognitive abilities associated with specific parts of the brain.
2. The *Cognitive Abilities and Intervention Strategies (CAIS) Questions to Ask* and the *CAIS Intervention Strategies* by S Weaverdyck. These provide **detailed intervention** strategies that address specific cognitive abilities, the environment, tasks and daily routines, and your communication with this person. These interventions can be **individualized** to a particular person and situation.
3. The **CAIS Educational Series** (for example, **Session #1**)
4. **Background resources** regarding the CAIS Educational Series and the CAIS online course

**All of these** are available on the above Michigan website at <https://www.improvingmipractices.org>

For a summary of information and possible intervention strategies for other specific disorders, see **CAIS Handout #19** (summary) and **#7** and **#8** about **Alzheimer’s Disease**, **#21** (summary) and **#38** (interventions) about **Frontotemporal Dementia**, **#35** (interventions) about the **frontal lobe**, and **#36** (interventions) about the **right hemisphere** of the brain. All of these are also available on the above website at <https://www.improvingmipractices.org>

Additional information about Dementia with Lewy Bodies can be found on the following three websites: The Lewy Body Dementia Association at <https://www.lbda.org> and the National Institute on

Aging at <https://www.nia.nih.gov/health/topics/lewy-body-dementia> and the Alzheimer's Association at <https://www.alz.org>

## INTRODUCTION

CAIS Handouts #19 and #21 summarize information and intervention suggestions regarding **Alzheimer's Disease (#19)** and **Frontotemporal Dementia (#21)**. With this handout #20 about **Dementia with Lewy Bodies**, these three CAIS Handouts briefly outline the brain changes in each type of dementia, the impact these changes have on cognitive abilities and behavior, and implications for effective intervention. They **highlight** the **differences** among these three types of dementia.

The three CAIS Handouts (#19, #20, and #21) are **companion pieces** in outline form with essentially each line or section of one handout corresponding with each line or section of the other two. The three can be laid out side by side and compared section by section.

## DEMENTIA

Dementia is a **gradual decline** in a person's cognitive abilities. This decline occurs because of changes in the **brain**.

**Cognitive abilities** include a person's ability to **think, understand** what they see or hear, figure out how to do things, **remember**, imagine, and many **other cognitive functions**. Cognitive abilities allow a person to **communicate**, understand and **respond** to their surroundings, create, and **perform tasks**.

If the decline in cognitive abilities is caused by a treatable disorder, for example, a urinary tract infection, vitamin deficiency, reactions to medications, dehydration, pain, or depression, it is likely **temporary** and **treatable**. (This is sometimes called delirium.)

In other cases the brain changes and resulting cognitive decline are **irreversible** and **progressive** (that is, increasingly severe). They are caused by disorders such as Alzheimer's Disease, vascular disorders, Creutzfeldt-Jakob Disease, Dementia with Lewy Bodies, or Frontotemporal Dementia. There are over 100 different disorders that can cause this progressive dementia.

Dementia with Lewy Bodies (DLB) is one of these irreversible and progressive disorders. Alzheimer's Disease is by far the most common cause of dementia in persons over the age of 65 years. **Dementia with Lewy Bodies** and **Parkinson's Disease Dementia (PDD)** are two types of **Lewy Body Dementia**, which is the second (or possibly third) most common cause of dementia. (Vascular dementia is the third or second most common.) DLB and PDD have similar symptoms, but in PDD a person first has symptoms of Parkinson's Disease (difficulty with movement) then later develops symptoms of cognitive changes. In DLB the **cognitive** or **behavioral** changes are the first symptoms to appear.

While there is no cure for Dementia with Lewy Bodies, there is much we can do to help a person feel comfortable, competent, and engaged by addressing the changes in their cognitive abilities. This is addressed in more detail in the other CAIS Handouts and resources noted above.

The information below applies generally to Dementia with Lewy Bodies (DLB). Each person experiences DLB differently, so **careful observation** and **response** to each person as an **individual** is important.

## CHARACTERISTICS

1. Brain Disorder
2. Most obvious **symptoms**: visual hallucinations; falls; changes in cognitive abilities, behavior, sleep, movement, and autonomic functions (for example, heart rate, digestion, urination)

3. **Progression:** increasing severity of symptoms over time (a progressive dementia)
4. **Onset:** insidious; generally age 50-80 or older, though could be younger; most are over age 50
5. **Duration:** approximately 5-8 years after diagnosis and ending in death (could be 20 years; may vary with time of diagnosis); shorter than AD and shorter life expectancy than AD
6. **Cause:** unknown
7. **Cure:** no cure at this time, but there is treatment to address symptoms
8. **Diagnosis:** no single definitive test available; clinical diagnosis based on pattern of symptoms and lab and other test results; verified at autopsy; often misdiagnosed in early stages as Alzheimer's Disease or a mental illness
9. Second (with all the Lewy Body Dementias) (or third) most common cause of dementia (4-16% of dementia cases seen in clinic)
10. Many persons with DLB also have neuropathology (plaques and tangles) in the brain found in AD
11. May be slightly more common in men than women, though this is uncertain
12. No confirmation of identified genes yet; minimal evidence of family history
13. **Course:** fluctuating (alternating periods of higher and lower functioning) within day, day to day, week to week; with an overall decline over time; spontaneous improvement and decline; more rapid course than AD; no stages specific to DLB have been identified
14. Increased sensitivity (death in some cases) to some medications (neuroleptics or antipsychotics)
15. Named after Frederic H. Lewy, a German neurologist who in 1912 found the pathology (Lewy Bodies) in the brain stem of a person with Parkinson's Disease
16. One of the Lewy Body Dementias
17. Other terms used to identify or classify: Diffuse Lewy Body Disease, Cortical Lewy Body Disease (CLBD)

## NEUROPATHOLOGY

1. Atrophy (that is, loss) of brain tissue; nerve cell death
2. **Lewy bodies** (composed mostly of a protein called alpha-synuclein) inside brain cells
3. Acetylcholine (neurotransmitter) reduction; death of nerve cells that produce acetylcholine
4. Dopamine (neurotransmitter) reduction; death of nerve cells that produce dopamine
5. Loss of connections between nerve cells in the brain (a cause of cell death)
6. Beta-amyloid plaques outside of nerve cells in brain (when Alzheimer's Disease is present, as it frequently is)
7. Tau tangles inside nerve cells in brain (when Alzheimer's Disease is present, as it frequently is)

## LOCATION OF CORTICAL BRAIN CHANGES

1. Cortical refers to the cortex (that is, the outer layer) of the brain
2. Changes (neuropathology) occur in the cortex and in internal (subcortical) structures of the brain
3. Changes (neuropathology) occur on both sides of the brain
4. Only some of the brain structures affected in DLB are included here
5. Cortical brain structures affected:
  - a. Hippocampus (subcortical) (later and less than in Alzheimer's Disease)
  - b. Parietal lobes
  - c. Occipital lobe
6. Subcortical changes disrupt frontal lobe functioning
7. Brain stem (subcortical): disrupted consciousness, REM sleep, sleep behavior, autonomic functions
8. Limbic cortex (subcortical): disrupted emotions
9. Basal ganglia and midbrain (subcortical): disrupted movement
10. Olfactory cortex and pathways (subcortical): disrupted ability to recognize smells (anosmia)

## **COGNITIVE CHANGES** (decline due to DLB)

Among **many** changes in cognitive abilities, this person may experience:

1. Difficulty processing information in general, including for example:
  - a. **Perception**, for example, recognizing the location of objects and people
  - b. **Executive** functions, that is, using the information they receive to, for example, make complex and subtle decisions or judgments, or to draw accurate conclusions
  - c. **Expressive** functions, that is, their brain's ability to tell their body how to move and to coordinate movements
2. **Fluctuations**: alternating periods of difficulty with cognitive abilities and periods of doing well
3. Unpredictability regarding fluctuations in emotions and expressions of distress
4. **First symptoms** evident usually as cognitive changes; though hallucinations and behavior changes may be the first for some persons
5. Memory loss, though less affected than in AD (memory loss more evident in later stages)
6. **Visuospatial** changes in perception and skill including difficulty with, for example:
  - a. Recognizing distance between objects and from self
  - b. Noticing objects in all parts of this person's visual field
  - c. Arranging objects in space
7. Changes in executive functions, as well as in frontal lobe skills that are less obvious due to subcortical changes that disrupt communication between frontal lobe and other brain structures
8. Difficulty with sustaining focus and **attention** for example, on an object, task, or conversation (this fluctuates and can be subtle)
9. Logic based on an inaccurate premise (for example, paranoia with a detailed, perhaps plausible rationale)
10. Problem solving difficulty beginning early in the course
11. Difficulty with planning and organizing beginning early in the course
12. More insight than in AD in general
13. Difficulty doing more than one thing at a time (multitasking)
14. A sense that their **visual hallucinations** aren't true, but they feel real and this person may feel emotionally engaged in them
15. **Reduced ability to perform tasks**, such as using the telephone, or dressing and other activities of daily living (this begins earlier in the course than it does in AD)

**Some persons** with DLB may experience at times:

16. Sensitivity to **noise**, for example, they may feel discomfort (sometimes extreme) when a fan is turned on or a door closes
17. Sensitivity to touch, for example, to the feel of a touch from someone else, or of their clothing against their skin
18. Episodes of disinhibition, leading sometimes to inappropriate sexual behavior
19. The ability to engage in manipulation or controlling behavior (for example, accusing a family member of wanting to poison this person so the family member can move back to Florida)
20. Capgras syndrome where this person believes someone they know is not actually who they are, and that this person is seeing an imposter
21. Reduced ability to recognize smells (anosmia)

## **EMOTIONAL CHANGES**

This person may experience:

1. **Mood shifts**: may be rapid
2. Unexplained and unpredicted anger or aggression at times
3. Depression (is common)
4. Anxiety
5. Apathy
6. Frustration, anger, fatigue (perhaps from processing confusing stimuli in their environment)

7. Pain, for example from rigidity

## BEHAVIORAL CHANGES

This person may experience, for example:

1. **Hallucinations:** particularly visual, emotionally engaging; beginning early in course; well formed, detailed; this person may or may not sense the hallucinations aren't real
2. **Parkinson symptoms:** slowed movements (bradykinesia); difficulty with balance; difficulty with coordination; rigidity; stooped posture; shuffling walk; may or may not have a tremor
3. **Falls** (earlier and more frequent than in AD)
4. Paranoia
5. Delusions
6. **Syncope** (fainting or at times falling possibly due to orthostatic hypotension where there is a drop in blood pressure upon standing)
7. Dizziness (perhaps from the orthostatic hypotension)
8. Constipation (beginning early in the course)
9. Urinary incontinence
10. Sexual functions physically impaired
11. **Transient loss of consciousness** (unexplained)
12. Good days (weeks) bad days (weeks)
13. **REM Sleep disturbance:** act out dreams (can begin years or decades before dementia symptoms appear; sleep may improve as dementia symptoms worsen)
14. Restless leg syndrome
15. Less sleep at night
16. Sleepiness during the day (sleeping more than 2 hours during the day)
17. May have episodes of sudden striking out or shouting due to unclear reasons perhaps due to, for example, noise sensitivity, frustration with visuospatial challenges, or directly from brain changes
18. Family and others may say this person does not have dementia (due to, for example, not enough memory loss, or to their ability to argue or to make others feel guilty)

## EXAMPLES

Examples from persons living with Dementia with Lewy Bodies (DLB):

1. **Memory for details:** A health professional who met with a person with DLB once a week, told this person that they would not see each other for two weeks because she was going to Florida to a friend's wedding. She showed him a photo of the friend who had long blond hair. Two weeks later, this person who was well into the course of DLB spontaneously asked the health professional how her trip to Florida to see blondie get married went.
2. **Nighttime acting out of a dream:** A man started punching his spouse in bed one night when he was having a dream that he was punching his brother as a child. The dream felt real to him. He didn't realize he was punching his spouse. It was difficult for him to wake up from the dream and stop the punching.
3. **Visual hallucination:** A group of people were sitting in a circle conversing, when one of the women reached over and slapped the person next to her. Afterwards the woman said there was a bloodied puppy dying on the floor and this other person was laughing.
4. **How do I know when a visual hallucination is real?** A woman called a nurse because she saw her brother lying on the floor with a heart attack. The woman later asked the nurse what to do to determine whether a hallucination is real or not.
5. **Visual hallucination that feels real even though logically it can't be:** A man who couldn't walk or move easily described an event that occurred last week when he was on a plane for Russia. He said at the "appointed time a bomb went off and there were flames everywhere. I mean I was here, but this really happened".

6. **Learning to accept help with recognizing hallucinations:** A woman accused her husband of being unfaithful. She said she saw him getting into their car with a woman in the front seat. That same woman would walk silently into their house through the front door and out the back door. Over time, she, her husband, and a friend agreed on a signal. They would tap their right thigh so she would know they were not seeing what she was seeing at that moment.
7. **This person not noticing everything in their visual field:** A woman's daughter came to say good by to her mother. She cautiously stood to the side of her mother (because she was worried her mother would hit her) and said good by several times. Her mother looked straight ahead and did not respond. Finally, the daughter leaned in from the side to kiss her mother's cheek and her mother struck the daughter's face. Afterwards, the daughter realized her mother hadn't seen her until she moved in close. Her mother was startled and frightened, not realizing what was happening.
8. **Sensitivity to noise:** When a woman overheard a quiet conversation near her, her face scrunched up in pain until the conversation stopped. Other times she was startled and very angry when a door closed or the heater in her bedroom came on.
9. **Planning ahead for being in public:** When a man is going to a restaurant, he plans ahead what he will order and writes it on the palm of his hand. At the restaurant, he opens his menu then reads his hand when he orders.
10. **This person using their own compensation strategy:** A man with advanced DLB sat at the table eating his lunch. As he slowly ate he very gradually moved his plate to his right. When someone else came along and moved it back in front of him, he slowly over time moved it to his right. He could see objects more easily in the right part of his visual field.

## INTERVENTIONS: COGNITIVE AND NONMEDICAL

1. See **detailed intervention** and support strategies in the **resources** identified at the beginning of this handout, including interventions that address **specific cognitive abilities** associated with **specific brain structures**. The resources also include a method of identifying an individual's particular cognitive strengths and needs, so that interventions can be **individualized** to this person and situation.
2. **Address cognitive changes** associated with each part of the brain that is affected in DLB (for example, **memory** later in the course for the hippocampus, **executive functions** for the disrupted frontal lobe skills, **visuospatial** functions for the parietal and occipital lobes).
  - a. Due to the parietal lobe changes, for example, it is usually helpful to **structure** this person's **environment** and keep it **consistent**. Avoid making changes in it unless necessary when this person's specific needs and preferences change, and then change it as little as possible. (For example, see **CAIS Handout #29** Visual-Spatial Interventions.)
3. Use **visuospatial** interventions (for example):
  - a. Economy of movement (move minimally, gesture minimally, organize so most of your movement is out of sight of this person)
  - b. Watch for this person's reaction and adjust your response
  - c. Reduce clutter, unnecessary objects and people
  - d. Reduce movement of objects and people
  - e. Slow down
  - f. Approach this person from the front
4. Examine and modify this person's **environment**, your **interactions** with this person, and their **tasks** and daily routines to accommodate this person's cognitive strengths and needs throughout the course of DLB (For example, see the **CAIS Intervention Strategies**.)
5. Modify interventions as changes occur
6. Maintain flexible and **accurate expectations** of this person (expect fluctuations)
7. Address unpredictability of cognition and behavior (for example, have alternative options planned)

- ahead for when this person's abilities or moods shift)
8. Do difficult tasks (for example, bathing) when this person is in a higher functioning day or period
  9. When this person asks for or seems to need assistance with a task, or is resisting a task, **offer assistance**. Avoid assuming they are stubborn or trying to manipulate you into helping them. Sometimes it is not obvious when this person is having a "bad" day or when tasks are more difficult for them, especially when they can talk easily and sound competent.
  10. Keep the tasks, tasks steps, and the structure and timing of the tasks **consistent** and **predictable**
  11. Keep the environment and the people in it consistent and predictable, including who interacts with this person and assists them
  12. **Watch** and **listen** to this person closely to notice how they respond to what you say and do; much of their expression of confusion or anxiety may be nonverbal
  13. Avoid arguing or trying to correct this person's perceptions or mistakes; avoid embarrassment
  14. Ask carefully (maybe indirectly) about hallucinations
  15. Address **hallucinations** (see **CAIS Handout #37** about DLB interventions)
  16. Consider with this person ways to tactfully communicate with them that their hallucination isn't real, and to reassure them during the hallucination
  17. Discuss with this person their situation and how to best support them, using this person's insight that may be intact at times into the later stages
  18. Identify the **compensation strategies this person already uses** consciously and unconsciously and build on them
  19. **Reduce noise**
  20. Monitor for mood shifts and unexpected aggression
  21. Have someone stay with this person to respond immediately to this person's reactions and behavior to prevent unexpected or unpredictable aggression
  22. Address depression and distress
  23. Prevent and address pain (for example, be gentle and adjust positioning and movement)
  24. **Exercise** to address mood, depression, pain, sleep challenges, physical health, and energy level, and to maintain muscles (for example, upper and lower body, and range of motion exercises)
  25. Help this person walk to keep their legs from going numb and to reduce rigidity
  26. Prevent falls
  27. Soften environment to reduce risk of injury from falls
  28. Monitor nighttime sleeping behavior
  29. Address **sleep** challenges (see **CAIS Handout #34** about sleep interventions)
  30. Protect the bed partner from this person's acting out of dreams and nighttime restlessness and confusion that could become harmful to others
  31. May need to move to a more supportive setting earlier than in AD (due to challenges and family fatigue)
  32. Remember what you like and admire about this person
  33. Gather information and learn about DLB
  34. Remind yourself and others the course is unpredictable due to fluctuations (though decline occurs overall)
  35. Remind yourself and others DLB can look like it is not dementia, though it really is (since it doesn't look like AD, it may not seem to be dementia)
  36. **Support family** and **others**; **reassure** them; for example, address uncertainty, frustration, and fatigue
  37. Address self-doubt and sense of guilt felt by family and others; for example, address doubts about their decisions and perceptions of this person due to the fluctuations in the course
  38. Discuss with or explain to this person, family, or others:
    - a. A description of the course of DLB
    - b. To remember it is dementia even when this person appears to express themselves easily or seems unlike a person with AD (for example, they have a good memory for details)
    - c. About fluctuations with DLB

- d. That expectations of this person can be too high (or too low) some days (since their strengths and needs are different from AD, and due to fluctuations)
- e. About unpredictable behavior and cognition
- f. That it is easy to feel guilty, even when guilt isn't warranted

## MEDICAL TREATMENTS

1. Cure unknown
2. Treat symptoms
3. Reduce loss of acetylcholine (AD medications)
4. Reduce loss of dopamine (Parkinson medications); use only minimally and only if necessary
5. Neuroleptics (antipsychotic medications) for hallucinations and delusions may cause severe rigidity or death (neuroleptics lower dopamine levels); avoid using
  - a. Medications that treat behavior and hallucinations (neuroleptics) may make the Parkinsonian symptoms worse; medications that treat the Parkinsonian symptoms (for example, Levadopa) may make behavior and hallucinations worse. **Avoid medications** when possible. Dosages of medications must constantly be monitored and adjusted.
6. Persons with DLB can be unusually sensitive to sedatives (extreme responses)
7. Melatonin for sleep should be used very cautiously
8. Antidepressants for depression
9. Treat restless leg syndrome
10. Address orthostatic hypotension
11. Address pain

## COMMENTS

1. In 1996 consensus criteria for clinical and pathologic diagnosis were created and have since been updated.
2. Kenji Kosaka, a Japanese neuropathologist first described in detail dementia with evidence of Lewy bodies from an autopsy in 1976.
3. Kosaka described more Lewy Body Dementia cases in 1984 after a new stain (dye) had been developed that made the Lewy bodies visible in autopsied brain tissue.
4. DLB is often misdiagnosed as: Dementia with psychosis, with agitation, with hallucinations, or similar behavior; or, early in the course, as a mental illness
5. Red flags that suggest a disorder might be DLB rather than AD:
  - a. High number of falls
  - b. Parkinsonian symptoms
  - c. Hallucinations (particularly visual, and particularly if this person knows or has a sense that the hallucinations may not be real)
  - d. Rapid shifts in this person's moods or emotions
  - e. Unpredictability (fluctuations) in course (for example, "good days" and "bad days")
  - f. Family doubts this is dementia because this person is too "high functioning" (they may view it as a mental illness or behavior that is manipulative or "mean")
  - g. History of "bad" experience with medications such as neuroleptics (antipsychotics)

## MORE ABOUT CHANGES IN THE BRAIN AND COGNITIVE ABILITIES

More details about changes in the brain and resulting changes in cognitive abilities in dementia are in **CAIS Handouts #7 and #8**.

Though these changes in behavior and cognitive abilities result from brain changes, changes in a person's behavior or cognition are often mistakenly viewed as intentional or manipulative. For example, this person may mistakenly be seen as stubborn, "mean", ornery, or lazy.



There are many **changes** in the **brain** with Dementia with Lewy Bodies. Four **neuropathological** changes are: Lewy bodies, neurochemical changes, beta-amyloid plaques, and tau tangles.

1. **Lewy Bodies** are **inside nerve cells** in the brain. They are abnormalities composed mostly of clumps of a protein called alpha-synuclein. The Lewy bodies are pink abnormalities that darken over time.
2. **Neurochemicals** (or neurotransmitters) facilitate the process of communication between nerve cells (that is, neurons), so essential to the brain's maintenance and functioning. A neurotransmitter is released from a nerve cell into the gap between it and another nerve cell. There are many types of neurotransmitters. In DLB, there is a **reduction** in the **amount** of some of these neurotransmitters, including two neurotransmitters called acetylcholine and dopamine. Some of the medications that treat the symptoms of DLB (or of AD that accompanies the DLB) inhibit acetylcholinesterase (which breaks down the acetylcholine). This allows more acetylcholine to remain in the brain. One of the medications Levodopa becomes dopamine. Carbidopa prevents the levodopa from being broken down, allowing more dopamine to become available in the brain.
3. **Beta-amyloid plaques** are little patches or collections of debris located **outside of nerve cells** in the brain in Alzheimer's Disease. A protein called beta-amyloid is a primary component of the plaques. Many persons with DLB also have these plaques.
4. **Tau tangles** are **inside nerve cells** in the brain in Alzheimer's Disease. They are collections of a protein called tau that begins to act abnormally to disrupt the transport of cell nutrients within the nerve cell, contributing to the cell's death. Many persons with DLB also have tau tangles.

### For more information

1. The Michigan website called Improving MI Practices at <https://www.improvingmipractices.org> has updates and many additional handouts and resources, including **all of these CAIS Handouts** (43 total), the **Cognitive Abilities and Intervention Strategies (CAIS) Questions to Ask** and the **CAIS Intervention Strategies, CAIS** information and background **resources**, and the **Caring Sheets: Thoughts and Suggestions for Caring** that are a part of the Michigan Dementia Care Series.
2. Mace, N., Coons, D., Weaverdyck, SE. (2005) Teaching Dementia Care: Skill and Understanding. Baltimore, Md.: Johns Hopkins University Press.

### Original Sources

3. Weaverdyck, S.E. (1991) "Assessment as a Basis for Intervention" and "Intervention to Address Dementia as a Cognitive Disorder". Chapters 12 & 13 in D. Coons (Ed.) Specialized Dementia Care Units. Baltimore, Md.: Johns Hopkins University Press.
4. Weaverdyck, S.E. (1990) "Neuropsychological Assessment as a Basis for Intervention in Dementia". Chapter 3 in N. Mace (Ed.) Dementia Care: Patient, Family, and Community. Baltimore, Md.: Johns Hopkins University Press.

### Dementia Care Series

The Michigan Dementia Care Series was edited and produced by Eastern Michigan University (EMU) Alzheimer's Education and Research Program for the Michigan Department of Health and Human Services (MDHHS), with gratitude to the Huron Woods Residential Dementia Unit at St. Joseph Mercy Hospital, Ann Arbor, Michigan.

All Caring Sheets are available online at the following websites: [http://www.michigan.gov/mdhhs/0,5885,7-339-71550\\_2941\\_4868\\_38495\\_38498--,00.html](http://www.michigan.gov/mdhhs/0,5885,7-339-71550_2941_4868_38495_38498--,00.html) (Michigan Department of Health and Human Services MDHHS), at <http://www.lcc.edu/mhap> (Mental Health and Aging Project (MHAP) of Michigan at Lansing Community College in Lansing, Michigan), and at <https://www.improvingmipractices.org> (Michigan Improving MI Practices website)

The Caring Sheets in the Michigan Dementia Care Series were originally produced as part of the in-kind funding for the Michigan Alzheimer's Demonstration Project. Funded by the Public Health Service, Health Resources and Services Administration (1992-1998) and the Administration on Aging (1998-2001) 55% federal funding and 45% in-kind match. Federal Community Mental Health Block Grant funding supported revisions to the Caring Sheets (2002-2018).