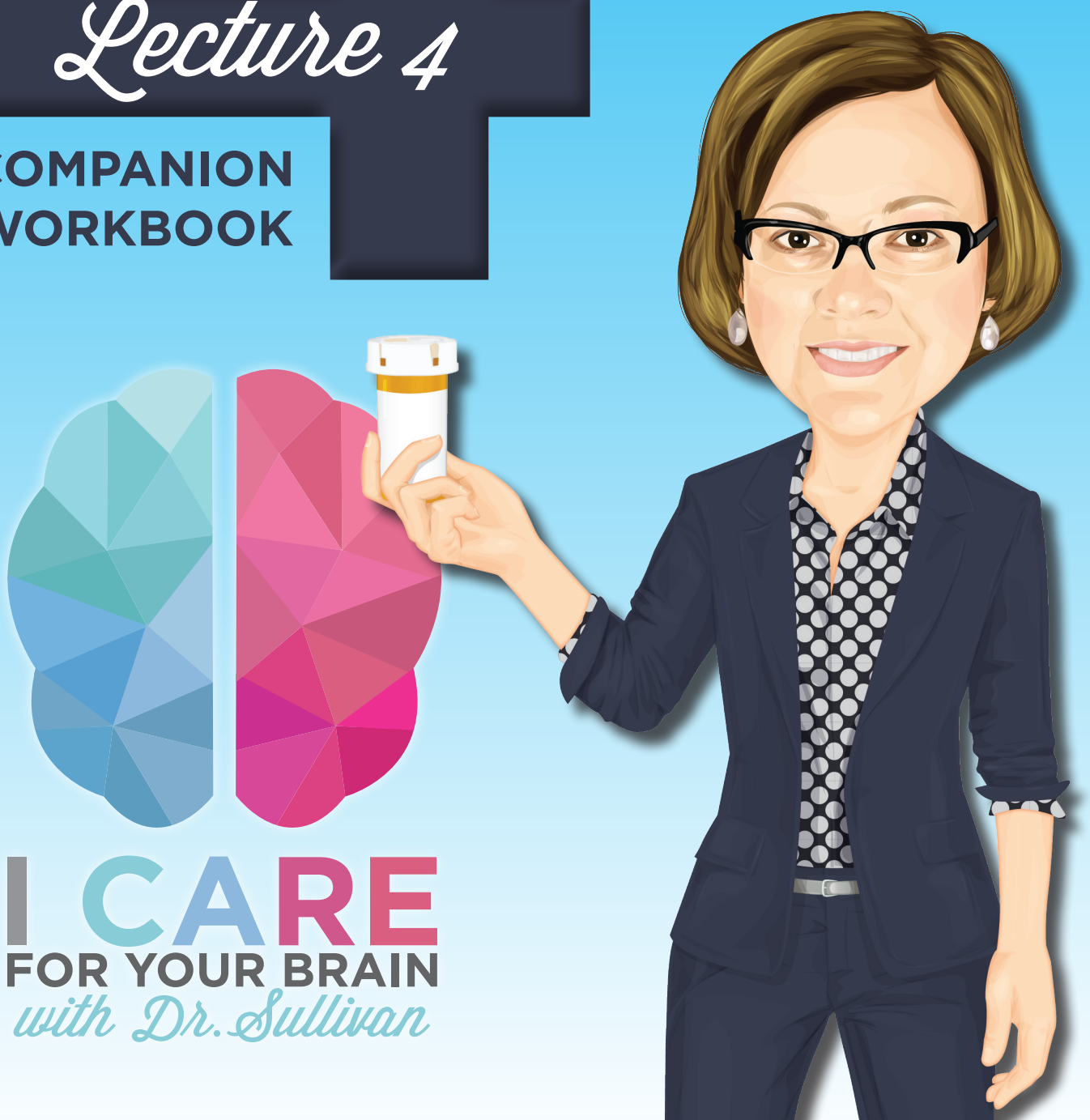
Lecture 4

How Do SUBSTANCES AFFECT THE AGING BRAIN?

From Diet to Alcohol and Health Supplements

COMPANION WORKBOOK



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with Dr. Sullivan

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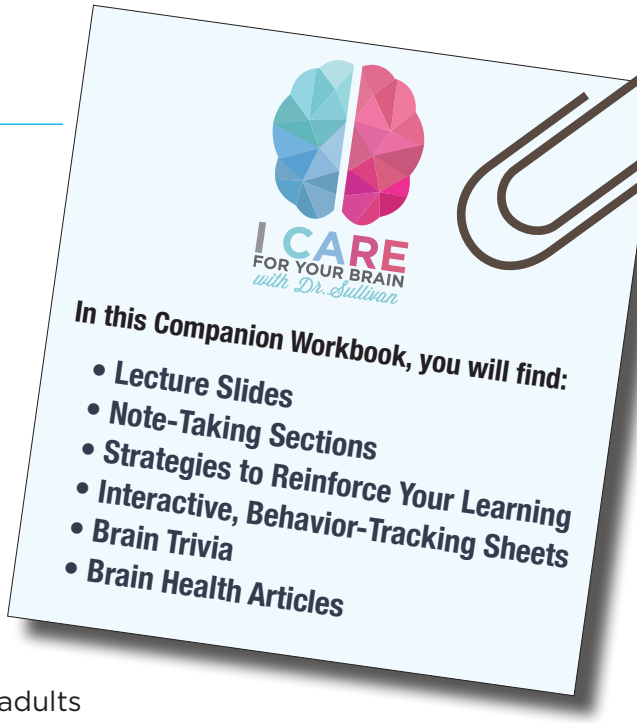
Hello again!

Here we are at Lecture 4! I hope you are feeling more informed and empowered about brain health with every lecture. By participating in this program, you are giving yourself two powerful gifts—knowledge and self-determination.

When I designed this program, I knew that YOU were out there, craving high-quality information and instruction about brain health. The problem was that you didn't have a trustworthy source for getting this information. As we've gotten to know each other, I hope I have gained your trust as someone who will give you objective and informed knowledge, without hype or gimmicks, that you can use to live a life of the highest quality.



In this lecture, we are focusing on a topic that many older adults tell me they are concerned about: the increasing amount of medications they are prescribed. The average older adult meets criteria for something called "polypharmacy," which means taking more than five medications per day. In fact, people between the ages of 50-64 receive an average of 19 prescriptions per year! We will discuss critical information about the changes that occur with age in our body's ability to absorb, distribute, metabolize and excrete substances. Unfortunately, these changes are not commonly understood and result in older adults being between two to seven times more likely to experience an adverse drug reaction than younger adults, including those requiring a hospital admission. There are also specific types of drugs that, under certain circumstances, can dramatically increase your risk of cognitive impairment, including dementia. It is another case of if we only knew better, we would do better!

One of the themes of the **I CARE FOR YOUR BRAIN** program is self-advocacy. YOU must be an active participant in your health and health care, and learn how you can act in a way that best supports the health of your brain when it comes to substances. You will learn to document all of the substances you take for yourself and the two best professional allies you have when it comes to substances: your primary care physician and pharmacist. You will become a more informed consumer of "memory-enhancing" supplements and over-the-counter medications that claim to support brain health. We will also discuss some alternative approaches to reduce chronic pain and anxiety that will help you be less reliant on medications as your only treatment. As a result of your new knowledge, you will be better equipped to make healthier decisions, and that is what this is really all about!

Thank you for the privilege of being your guide on this brain health journey! There's no place I'd rather be.

Dr. Karen D. Sullivan

Brain Matters

COMPANION WORKBOOK 4

I CARE FOR YOUR BRAIN with Dr. Sullivan

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I CARE FOR YOUR BRAIN

was founded on the belief that successful cognitive aging is more than just brain health. It is a multi-dimensional concept that in addition to being brain-based is also rooted in physical health, social and spiritual connectedness, and vital engagement in life.

It is a state-of-the-art, brain-centric education program for the 50+ crowd delivered in an engaging, easy-to-understand style that is motivating for action!

Through two interactive communities (in-person and online), Neuropsychologist Karen D. Sullivan, PhD, ABPP, provides scientifically-based information on what brain scientists know are the pillars of brain health and evidence-based recommendations in a series of nine lectures. Dr. Sullivan provides you with clear, proven action steps you can take to immediately start to truly care for your brain.

Sign up online today at www.ICFYB.com.

"Dr. Sullivan has done an amazing job of bringing important brain issues to the forefront. She explained the topics in a very clear and interesting manner—things no one talks about, always with a little humor and, most importantly, a great deal of knowledge. Thank you."

What *will you* say?

Let's get started!

Watch Dr. Sullivan's Facebook LIVE Mini Brain Health Lectures

JOIN our FREE Facebook Community Today!

Reduce Use of Pain Medication with Cognitive Strategies *for Better Brain Health*

BY KAREN D. SULLIVAN, PHD, ABPP

Traditional treatments for pain relief have not changed much in the past 100 years, and we continue to use anti-inflammatories, sedatives, muscle relaxants and opiates. When taken properly, these medicines can be lifesavers. However, the increasing use of powerful opioid pain medications (hydrocodone, oxycodone and Fentanyl are some of the most common), particularly in older adults, is concerning as they decrease cognitive abilities and raise the risk for traumatic fall.

Opioid prescriptions in the United States have increased by more than 600 percent in the last 20 years, and the current use in older adults is estimated to be at 25–50 percent for those living at home and as high as 70 percent for those living in long-term care facilities.

In recent years, pain specialists have began to offer alternative treatment options for pain, including hot and cold therapy, topical rubs, physical therapy, epidural injections and TENS (Transcutaneous Electrical Nerve Stimulation) units that many people find helpful.

The brain can learn how to manage the sensation of pain...

Chronic pain has been defined as an unpleasant physical sensation lasting more than three months that reduces daily functioning and well-being, including mental and social health. Approximately 116 million older adults in the U.S. live with chronic pain. Being in pain every day decreases our ability to deal with life's other stressors and can lead to a feeling of being chronically overwhelmed. The successful treatment of chronic pain requires treatment on multiple levels. The goal is to keep chronic pain from becoming the entire focus of your life.

The good news is that the brain can learn how to manage the sensation of pain. Many people living with chronic pain are starting to add mental strategies, such as biofeedback, relaxation, guided imagery, deep breathing and cognitive behavior therapy to feel less dependent on pain medications and more able to control pain.

The first step in coping with chronic pain is to receive a thorough medical evaluation to determine the cause of the pain. Pain can serve as a warning signal from our brain of impending damage and injury. Once it is determined why the pain is happening, these two cognitive behavioral therapy strategies can help you to start to reduce pain as early as today: cognitive re-framing and mental distraction.

Cognitive Re-framing

Cognitive strategies are based on the belief that our thoughts and behavior shape our reality. In the case of chronic pain, the way we think about our pain, the way we "make sense" of the experience of pain determines how much the pain affects us.

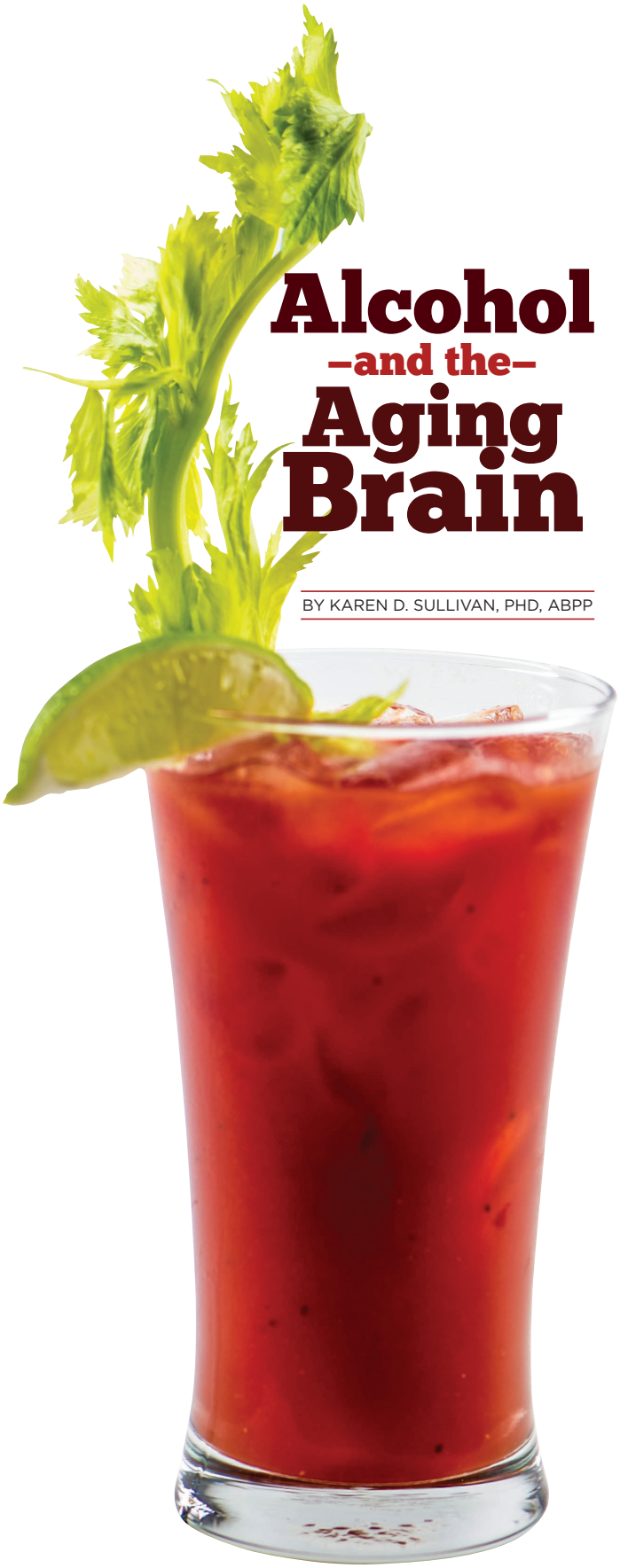
Changing well-worn ways of thinking and acting takes practice and effort but can pay off in a big way. First, you need to become aware of the messages you habitually give yourself, the dialogue you have with yourself in response to any situation. This tends to be so automatic and routine that we may not even be aware of our self-talk. Spend a day asking yourself, "What am I feeling right now?" Define the exact emotion. And then, ask yourself, "What am I thinking right now that is making me feel angry, frustrated, sad, ashamed or joyful?" You will be amazed at what happens in the quick gap between a thought and an emotion. Common themes related to chronic pain include, "I feel so overwhelmed and hopeless. This is never going to end, I can't do anything, so I might as well just stay here in bed."

Next, ask yourself, "What is my evidence that this is true? Am I considering all of the possibilities? Is it really true that I can't do anything?" When thinking becomes negative and all-or-nothing, try to offer yourself a positive and balanced coping thought, such as, "Today might start off not so great, but if I can get in a hot shower and stretch a bit, I always manage to have a better day." See the difference in behavior that happens when we *think* differently?

The Power of Distraction

Research has shown a significant relationship between focusing on the pain (how bad it hurts) and poor sleep, more anxiety and, in turn, a worsening of pain. When we focus on pain, we have a tendency to catastrophize and only focus on the hurt with thoughts like, "This is so bad, I can't stand it, this will never go away." By changing our focus away from painful bodily sensations to something engaging or pleasant, we can reduce the sensation of pain.

Instead, try to focus on parts of your body that aren't in pain and other senses, like taste and smell. Listen intently to your favorite music, talk to a friend who cheers you up, watch birds gather at a bird feeder or spend time with a pet. Make sure you talk about other topics with friends and family, not just your physical health.



Alcohol –and the– Aging Brain

BY KAREN D. SULLIVAN, PHD, ABPP

Approximately 50 percent of men and 40 percent of women age 60 or older drink alcohol on a regular basis. There is a large body of research to suggest that alcohol in small amounts can be healthy. The cardiovascular benefits of red wine with its flavonoids and antioxidants, in particular, have shown to improve heart and brain health. In contrast, "at-risk drinking," defined as more than three drinks in one day or seven drinks per week in older adults, can have the opposite effect, including:

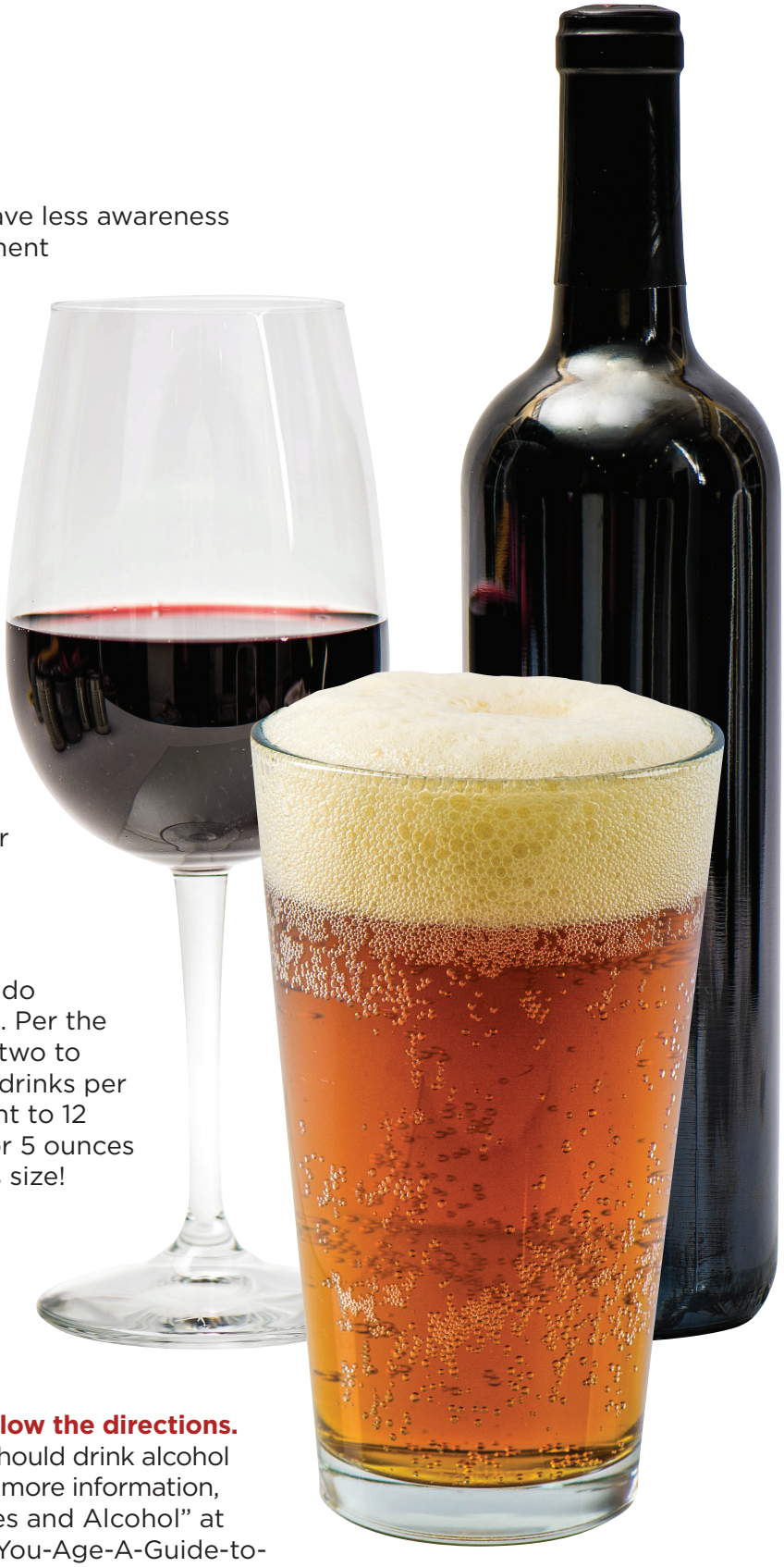
- **Increased risk of hypertension, cardiac arrhythmia and myocardial infarction**
- **Increased risk of stroke**
- **Impaired immune system**
- **Decreased bone density**
- **Liver diseases, including cirrhosis**
- **Gastrointestinal bleeding**
- **Depression**
- **Cognitive impairment**

After drinking the same amount of alcohol, older adults have higher blood alcohol levels than younger people. This is due to a decrease in muscle mass and reduced functioning of the liver and kidneys. These age-related changes slow the body's ability to process and excrete alcohol. Therefore, alcohol remains in the bloodstream longer. As the brain ages, the blood-brain barrier weakens, making the brain more vulnerable to the toxic effects of alcohol.

Moderate to high alcohol consumption in middle and older age can result in cognitive impairment and dementia in later life. One study found a five times greater risk of dementia in men older than 65 with a 15-plus year history of heavy drinking.

Research suggests that older adults have less awareness of the effects of alcohol on their judgment than younger adults, which may make it harder to know your "new" limit. For example, it may lead someone to be incapable of driving after two drinks, whereas previously they felt they could drive safely after consuming the same amount.

Older adults are also at higher risk for dangerous alcohol–medication interactions. The combination of alcohol and benzodiazepines, antidepressants, pain medications, sleeping pills and cold/flu medications are particularly unsafe. Alcohol may decrease the effectiveness of drugs or intensify side effects, including dizziness or loss of coordination, making falls or car accidents more likely.



The Bottom Line:

- **If you don't drink, don't start.** If you do drink, enjoy alcohol in small amounts. Per the guidelines, this means no more than two to three drinks per day and seven total drinks per week. Each drink should be equivalent to 12 ounces of beer, 1.5 ounces of liquor or 5 ounces of wine. Don't get creative with glass size!

- **Sensitivity changes.** Recognize that your sensitivity to alcohol may have increased, so you may not need as much as you once did to enjoy the benefits.

- **Read your medication labels, and follow the directions.** Ask your doctor or pharmacist if you should drink alcohol while taking a particular medicine. For more information, download "A Guide to Aging, Medicines and Alcohol" at http://store.samhsa.gov/product/As-You-Age-A-Guide-to-Aging-Medicines-and-Alcohol/SMA04-3940

- **It's never too late to reduce or stop drinking if you think you have a problem.** The brain can recover remarkably well from years of too much drinking in many people with prolonged abstinence. If you need support, ask your doctor, spouse or a friend for help.

MINIMIZE RISK of Delirium During Hospital Stays

BY KAREN D. SULLIVAN, PHD, ABPP

A hospital stay is one of the more stressful experiences we can have in life. Our senses can be overwhelmed, our sleep disrupted and it's normal to feel anxiety of what is to come. Emergency or planned surgeries can be particularly demanding and really take us out of our comfort zone. Doctors and nurses do an excellent job taking care of us after surgical procedures, but at a time when a person needs a high level of rest, patients are often awakened throughout the night, taken into unfamiliar rooms for different procedures, and given new—and oftentimes powerful—medications.

Older adults are at risk for sudden and distressing brain changes after surgery called delirium, a syndrome made up of four primary symptoms: acute confusion that is not normal for that person, agitation, sleep/wake disturbance and visual hallucinations/delusions (seeing things and people that are really not there and/or false beliefs).

According to the New England Journal of Medicine, the overall prevalence of delirium is 1–2 percent in older adults older than 65 living in their homes, 14–24 percent during a general hospital admission, 15–53 percent in post-surgical patients and 70–87 percent in intensive care units.

Above and beyond age, there are specific risk factors that increase one's likelihood of getting delirium, including those with pre-existing (even mild) memory issues, those undergoing lengthy procedures requiring prolonged anesthesia or major orthopedic surgery (knee or hip replacement, for example) and those who get an infection during the course of hospitalization (including urinary tract infections or MRSA).

The length of a delirium varies greatly across individuals and can last only a day, a few weeks or much longer. Unfortunately, for some older adults, delirium can cause a permanent cognitive decline. The worst outcomes tend to happen in older adults with significant memory issues prior to surgery, as delirium can accelerate the rate of progression of dementia.

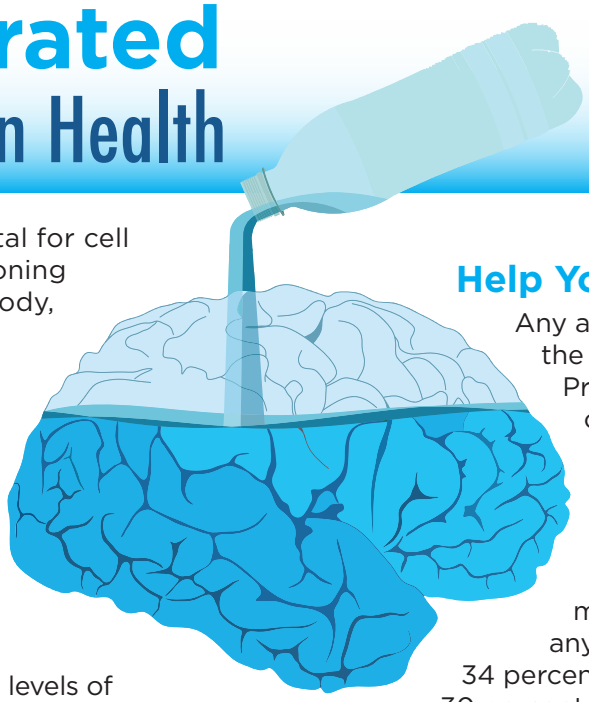
There are no FDA-approved medications for delirium, so treatment recommendations focus on prevention, symptom management and identifying the underlying cause. In terms of prevention and symptom management, the most effective approaches are behavioral and best implemented by those spending the most time with the patient. Family members should make sure the individual has their eyeglasses and hearing aids, if prescribed, and speak in clear and brief statements with good eye contact. Limiting room changes, to the extent possible, and creating a quiet and soothing environment (noise machine or calm classical music, low-level lighting at night) that encourages uninterrupted sleep at night is very beneficial.

Family members often struggle to understand what has happened when delirium occurs. A neuropsychological evaluation can help a patient and their family understand exactly what cognitive and behavioral symptoms are persisting for that individual, how to best help the delirium resolve and, when needed, how to adjust to changes in their ability as they return to their everyday life, including driving a car or managing money.

If you are considering a major surgery, talk with your doctor about your personal risk for delirium. Consider getting a baseline cognitive evaluation to identify and minimize your specific risks factors.

Stay Hydrated for Better Brain Health

BY KAREN D. SULLIVAN, PHD, ABPP



Water is fundamental for cell and organ functioning throughout the body, especially in the brain, and allows for many critical functions, including carrying nutrients and waste products to and from cells via our blood and out of our body through the kidneys. Of special interest to I CARE FOR YOUR BRAIN-iacs, is the effect of dehydration on the brain and cognitive functioning. Even mild levels of dehydration can affect mood (more irritability, more depression) and affect our ability to be alert, pay attention and make short-term memories.

The Risks of Dehydration

The amount of water in the body decreases by about 15 percent between the teen to older adult years. After age 65, our body water content declines most considerably. Therefore, the risk for dehydration increases with age, and consequences can range from relatively mild (dry mouth or lips, flaky skin, recessed eyes) to more serious symptoms (trouble maintaining body temperature, change in blood pressure, more weakness and fatigue, increased pain due to lack of joint lubrication) and all the way to the most serious risks, including hospitalization and death.

Dehydration is one of the top 10 reasons for hospitalization in older Americans. Hospitalization then poses its own set of risk factors for the older adult, including opportunistic infection and falling, which are associated with poor health outcomes.

This is likely due to multiple factors, including a reduced sense of thirst, which leads to less liquid intake, declines in smell and taste that make drinks less appealing, decreased mobility (harder to get up and get a drink), urinary incontinence, use of laxatives or diuretics (many medications have a diuretic quality that are not known to the person or their family, especially blood pressure and anti-depressants) and, perhaps most notably, an age-related decrease in kidney function makes it harder for us to hold onto water.

Help Your Kidneys Help You

Any amount of dehydration makes the kidneys have to work harder. Properly working kidneys are critical for the proper processing and eliminating of all substances in the body, particularly metabolites from medications. This is critical for older adults, because as a group, they receive more medications per year than any other age group, an estimated 34 percent of all prescriptions written and 30 percent of all over-the-counter drugs. Adverse drug reactions are a leading cause of hospitalization in older adults, and this has been attributed to poor metabolization due, in part, to decreased kidney functioning.

Avoiding Delirium

Maintaining a constant mineral balance is also critical as we age. A disruption in basic body minerals dramatically increases the risk for a condition called delirium, particularly in those older than 85 and in adults over 65 with an illness. Delirium is a very serious condition that causes acute mental status change, psychotic symptoms, agitation and sleep/wake disturbance, and is very distressing for families.

Ounces of Prevention

Prevention is key! Here are some strategies for ensuring adequate water intake:

- **Make water readily available** (at bedside or chair side) by placing a water bottle next to you.
- **Drink 8 ounces of water** with morning/afternoon medications and 4 ounces with evening meds.
- **Strive for a minimum intake of 50-80 fluid ounces per day.** Try for the higher end during times of increased risk of dehydration, such as illness, high heat, stress and exertion.
- **Check volume and color of urine**: the more output and lighter the color, the more hydrated; the less output and darker the color, the more dehydrated.
- **If you are concerned, talk to a medical provider.** There is no definitive lab test for dehydration, but checking electrolyte levels in the blood, including sodium and potassium, can be revealing.

Eat, Drink & Be MINDful

BY CARRIE FRYE

With the variety of popular diets touting specific benefits, there is one brain-centric option that researchers believe provides a better option for a healthy brain and body in the MIND diet. An aptly named acronym for Mediterranean-DASH Intervention for Neurodegenerative Delay, this diet combines the ideals of whole and natural foods and those lower in sodium, benefiting both the brain and heart.

The purpose of the MIND diet, as developed by Chicago's Rush University Medical Center epidemiologist Martha Claire Morris, ScD, was to create an easy-to-follow diet plan that also lowers the risk of developing dementia. The MIND diet focuses on consuming 10 healthy food types regularly, while avoiding five specific unhealthy food categories.

Think Natural

Put these healthy foods at the top of your grocery list for meal planning:

1. **Beans**
2. **Berries**
3. **Fish**
4. **Green leafy, vegetables**
5. **Nuts**
6. **Poultry**
7. **Olive oil**
8. **Vegetables**
9. **Whole grains**
10. **Wine**

Add three servings of whole grains (whole grain bread, oatmeal, brown rice, etc.) and a fresh salad to your daily routine. Grab a handful of nuts for a daily snack and a serving of berries, especially blueberries, at least twice a week. Every other day, add another fresh vegetable, especially green, leafy vegetables, like spinach, collards, kale and greens, and a serving of beans. At least twice per week, have a serving of poultry and once a week, fish. If desired, partake in one serving of wine per day.

Know Your Limits

Make an effort to limit or stop eating these unhealthy foods, consuming no more than one serving per week, excluding butter, which is only recommended to be a tablespoon or less per day:

1. **Butter**
2. **Cheese**
3. **Fried food/fast food**
4. **Red meats**
5. **Sweets/pastries**

Dr. Morris' study results, which were funded by the National Institute on Aging, spanned nearly 10 years and followed more than 900 older adults. Participants who strictly adhered to the diet lowered their risk for developing dementia by as much as 53 percent.

The findings earned the MIND diet the third in the Best Diets Overall by U.S. News & World Report, falling after the diets it was derived from, the DASH and Mediterranean. Although Dr. Morris is a proponent for more studies, her latest results show the MIND diet to be superior in its prevention of cognitive decline.

Dr. Sullivan also recommends the MIND diet to her patients and those wanting to focus on their brain and heart health.

"I like the MIND diet, because it offers a realistic set of guidelines for making healthier food choices," Dr. Sullivan says. "I am encouraged that the research suggests that even moderate adherence to this diet resulted in a protective benefit against dementia. However, it is important to remember that, as is the case with all diets, the foods that we tout for their brain-boosting powers have to be consumed in conjunction with other lifestyle choices to truly have a benefit, like consistent cardiovascular exercise, socialization, cognitive stimulation and spiritual connection.

"Any one thing in isolation is only going to have a limited effect on something as complex as the brain. That being said, the MIND diet has the strongest research base at this time and is the one that I most recommend to my patients."

If you want to add more of the 10 healthy food categories and less of the unhealthy into your diet, consider starting a food journal to track your progress each week. It's an easy way to make notes and help hold yourself accountable. **SEE PAGE 58**

Lecture 4
How Do
SUBSTANCES AFFECT THE AGING BRAIN?

From Diet to Alcohol and Health Supplements

- Lecture series focused on the brain health of older adults
- Evidence-based information and recommendations
- Supported by science and unbiased clinical expertise
- Motivating you to action!

Slide Presentation Begins

LEARNING TOPICS

- How do older adults uniquely process substances?
- A closer look at:
    - Prescription Medications
    - Over-the-counter Drugs
    - Supplements
    - Alcohol
- I CARE FOR YOUR BRAIN Recommendations

WHY IS THIS TOPIC IMPORTANT

- **Older adults disproportionately use more prescription and non-prescription drugs**
- **Polypharmacy (more than five drugs) is common as we age and increases the risk of adverse interactions**
- **Older adults are 2-7 times more likely to experience an adverse drug reaction than younger adults and approximately 1/3 of hospital admissions in older adults are associated with prescription medications**
- **Modifiable risk factor = We can do something about it!**

NOTES

HOW IS THE OLDER ADULT UNIQUE?

Changes in our body's ability to absorb, distribute, metabolize and excrete substances as we age

Less muscle mass + less water in body + decreased functioning of liver and kidneys + decrease in blood flow = prolongs drug half-lives and increases sensitivity

Blood-brain barrier more permeable = cell sensitivity in the brain increases

Chronic illnesses change the way substances are processed

The interactions between medicines and over-the-counter drugs are more common and largely unknown

Older adults and those with significant comorbidities are often excluded from clinical trials used to develop medications

NOTES

Prescription Drugs

IMPORTANT

Don’t stop taking any medications without your doctor’s agreement

Do not make medication decisions based only on this lecture

Weighing the risks and benefits of multiple medications is a challenge

Psychologists are not physicians

NOTES

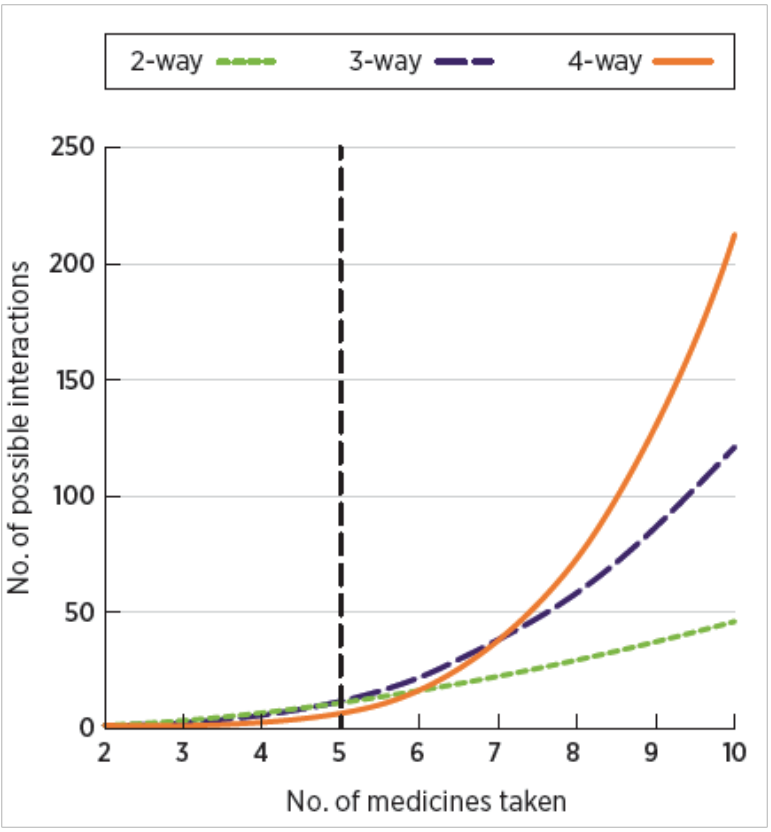
All prescription medication use is on the rise

People between the ages of 50-64 received on average 19 prescriptions per year

More medications usually means

- More chronic illnesses
- More likely to make an administration mistake
- “Too many cooks in the kitchen”
- More chances for unanticipated interactions

NOTES



Ferner & Aronson, 2006

NOTES

OPIOID PAIN MEDICATIONS

Percocet, Percodan, OxyContin (oxycodone)
Vicodin, Lorcet, Lortab (hydrocodone),
Dilaudid (hydromorphone), Fentanyl,
Tramadol

In the past 20 years, opioid prescriptions in the U.S. have increased by more than 600% ***(Paulozzi & Baldwin, 2012).***

Prevalence of pain in older adults is estimated to be at 25–50% and for nursing home residents as high as 70% ***(Ferrell 2003).***

Opioids are mostly processed and excreted by the kidneys = more potent and with longer duration in older adults

NOTES

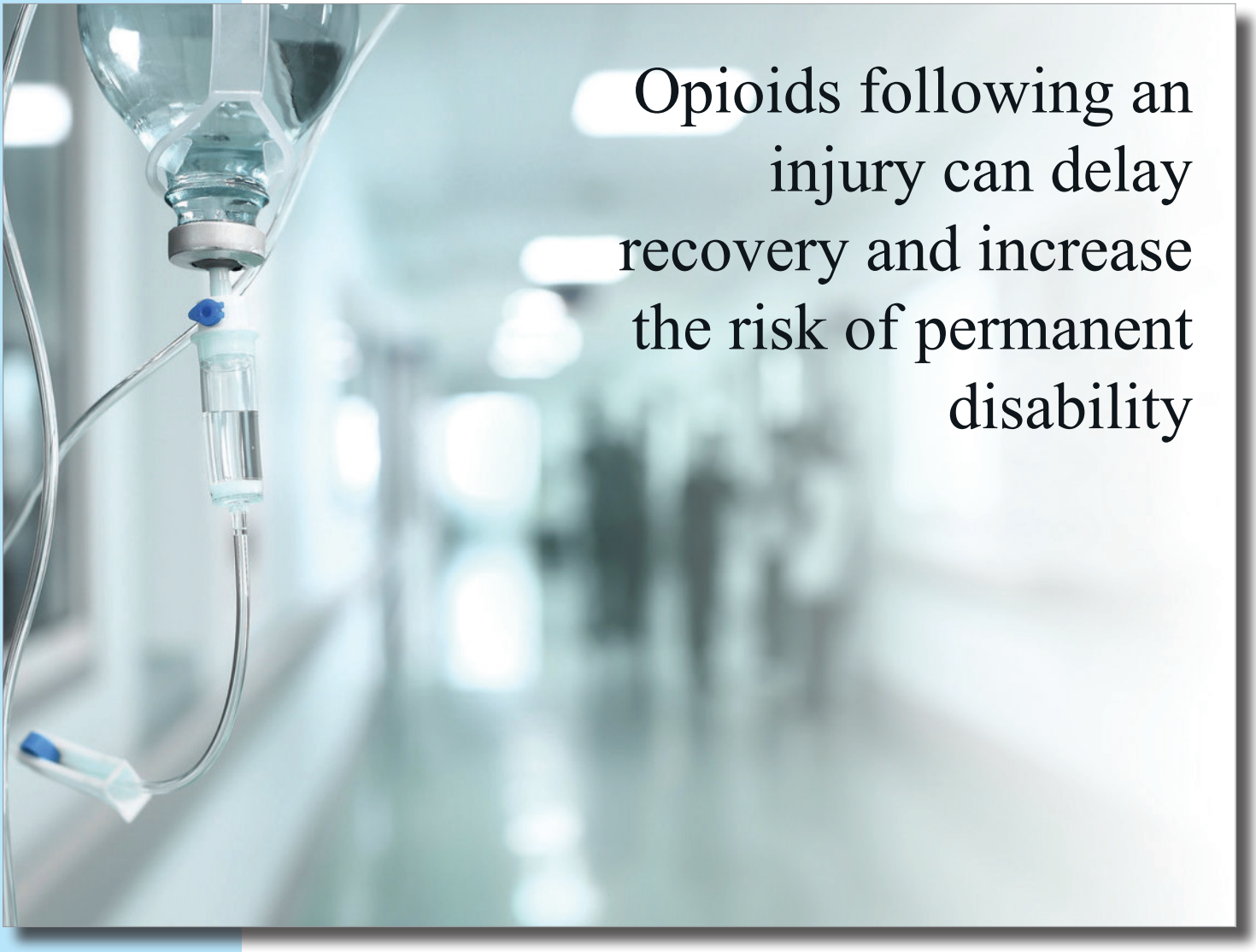
INCREASED FALL RISK

64% increased risk of falls in older adults taking opioids for pain as compared to those taking NSAIDs (ibuprofen, naproxen).

The risk of fracture of the humerus (the bone in the upper arm) was 9x greater on opioids. The risk of fracture of the hip was 3x greater on opioids ***(Solomon et al., 2010).***

Complications of hip fracture is a leading cause of death in older women, and up to half of older adults hospitalized for hip fracture never return to their previous level of function ***(Tinetti & Williams, 1997).***

NOTES


Opioids following an injury can delay recovery and increase the risk of permanent disability

NOTES

COGNITIVE EFFECTS OF OPIOIDS

Complicated because pain itself causes cognitive dysfunction

Reduces memory *(Schiltenwolf et al., 2014)*

Especially concerning for those with lung disease (COPD) or sleep apnea.

- Opioids slow breathing, causing people with lung disease to breathe slower and therefore have lower oxygen levels
- Opioids have been shown to worsen sleep apnea ***(Jungquist, Flannery, Perlis, & Grace, 2012)***

More cognitive symptoms →

NOTES

BENZODIAZEPINES

Alprazolam (Xanax), diazepam (Valium), lorazepam (Ativan)

Used to treat anxiety, sleep and spasticity

Usually intended for short-duration use but can be habit-forming

Increases falls and fractures ***(Wolcott, 2009)***

The risk of hip fracture is greatest within the first 2 weeks of therapy, increasing with higher doses and when other centrally acting nervous system drugs are added ***(Martin et al, 2013)***

Account for a substantial number of preventable emergency department visits and hospital admissions ***(Hampton et al 2014)***

NOTES

COGNITIVE EFFECTS OF BENZODIAZEPINES

Complicated b/c anxiety and insomnia can cause cognitive dysfunction

In older adults, benzodiazepines have been shown to result in poor memory storage, decreased attention and reaction time ***(Tannenbaum, 2012)***

Increased risk of delirium ***(Clegg & Young, 2011)***

Associated with greater risk of a motor vehicle crash requiring hospitalization in older drivers ***(Meuleners, 2001).***

NOTES

RELATED TO DEMENTIA?

Risk of long-term use is conflicting; evidence overall suggests risk of cognitive impairment increases with long-term use

Study found an association between benzodiazepine use in older adults and increased risk of Alzheimer's disease.

The association was stronger with increasing length of use; the risk was nearly doubled for those using benzodiazepines for more than 180 days *(Billioti et al., 2014; Weich et al 1996)*

The American Geriatrics Society says: Don't use these drugs in older adults as first choice for insomnia, agitation or delirium.

Some use may be necessary

NOTES

Despite contraindications, they are disproportionately prescribed to older adults *(Olfson, King, & Schoenbaum 2015).*

- From 2008 - 2015, the proportion of benzodiazepine use that was long term increased with age from 2.6% to 14.7% (18-35 years) and 8.7% to 31.4% (65-80 years).
- Benzodiazepine use is nearly twice as prevalent in women as men
- Older adult advocates emphasize that there are safer alternatives for the management of anxiety and insomnia, like cognitive behavior therapy and relaxation techniques

NOTES

Over-the-Counter DRUGS

OTC medications are an effective way to shift a greater share of health care costs to the consumer

Over 100,000 over-the-counter (OTC) medications on the market

Adults over 65 years are the largest users of OTCs, accounting for up to 40% of sales, and twice as many OTC drugs as prescription drugs are being used by older adults.

1 in 25 older adults are at risk for a major drug interaction, and half of these involved nonprescription medications (Qato, 2008)

Problem is we don't take their use seriously, forget they are drugs

NOTES

ANTICHOLINERGICS

- Very common, about 50% of adults over 65 years old take one or more anticholinergic prescription medications or OTC.

- Greater than 600 different drugs.
  Present in almost every drug category, including antidepressants (Paxil),
  bladder relaxant (oxybutynin, Vesicare), muscle relaxants (Flexiril), cardiac (Lasix, Lopressor), gastrointestinal
  (Zantac), and opioids (pain meds).

- OTC: Benadryl, Dramamine, any “PM” drug,

- Effects are generally worse with more medications

NOTES

EFFECTS

Blocks neurotransmitter acetylcholine from binding to its receptors on certain nerve cells and inhibits communication.

Symptoms:

- Increased dryness
- Slowed gastrointestinal motility
- Blurred vision
- Heat intolerance
- Sedation
- Mental changes

NOTES

MILD CONFUSION TO DEMENTIA

Risk for cognitive impairment was increased by 50% in adults receiving at least 3 mild ACs for more than 90 days and by 100% in those receiving 1 or more severe ACs for more than 60 days ***(Cai, 2013).***

After about 7 years, older adults taking these were 4x more likely to develop dementia; had less brain matter especially in memory areas ***(Risacher, 2016)***

Especially in those with pre-existing cognitive impairment, there is increasing evidence that more cognitive decline, physical impairment, and increased risk of death are associated with a high anticholinergic burden.

NOTES

Supplements

AARP (2016): More than 60 percent of older adults take at least one supplement

Around 1 in 55 hospital admissions is caused by an adverse event due to a reaction between a dietary or herbal supplement and another medicine or supplement (Levy, 2017)

Limited evidence to support claims of efficacy

Let's take a closer look at:

Coconut oil
Turmeric
Melatonin
Prevegan

NOTES

COCONUT OIL

Theory: Coconut oil is rich in medium-chain triglycerides, which are metabolized differently than most fats and break down into ketones and used by the brain as "secondary" fuel

"Treats/prevents Alzheimer's disease"
"Improves brain health"

As of 2017, there is inadequate evidence to suggest that coconut oil is effective for treating any brain condition. No rigorous, large -scale research studies. Not approved by the FDA as a treatment for any kind of ailment.

NOTES

TURMERIC

In 2017, the most comprehensive critical review yet of curcumin, the active ingredient in turmeric, found no evidence of any specific therapeutic benefits, despite thousands of research papers and more than 120 clinical trials ***(Nelson et al, 2017)***

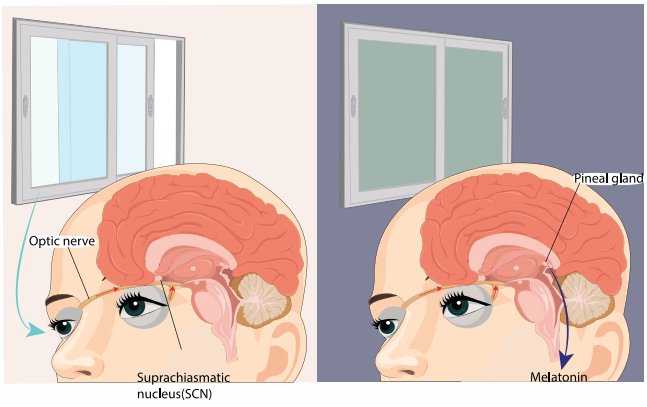
"Findings were often hyped up and incorrectly translated in the media. No double-blinded, placebo controlled clinical trial of curcumin has been successful."
– Dr. Katherine Nelson, Journal of Medical Chemistry

NOTES

MELATONIN

Produced by various tissues in the body, but mostly in the pineal gland in the brain

Melatonin release



- The production and release of melatonin occurs on the circadian rhythm, with peak levels occurring at night.
- **Supporting evidence that melatonin puts you to sleep earlier and helps you stay asleep longer (but not by much!)**
- Blue light from handheld devices linked to increased risk for sleep disorders due to the light hazard of short wavelengths = melatonin production is suppressed

NOTES

$165 million in sales

Active ingredient, a protein derived from jellyfish, claims to improve memory and reduce age-related memory impairment

$24 - $68 per bottle

30 pills

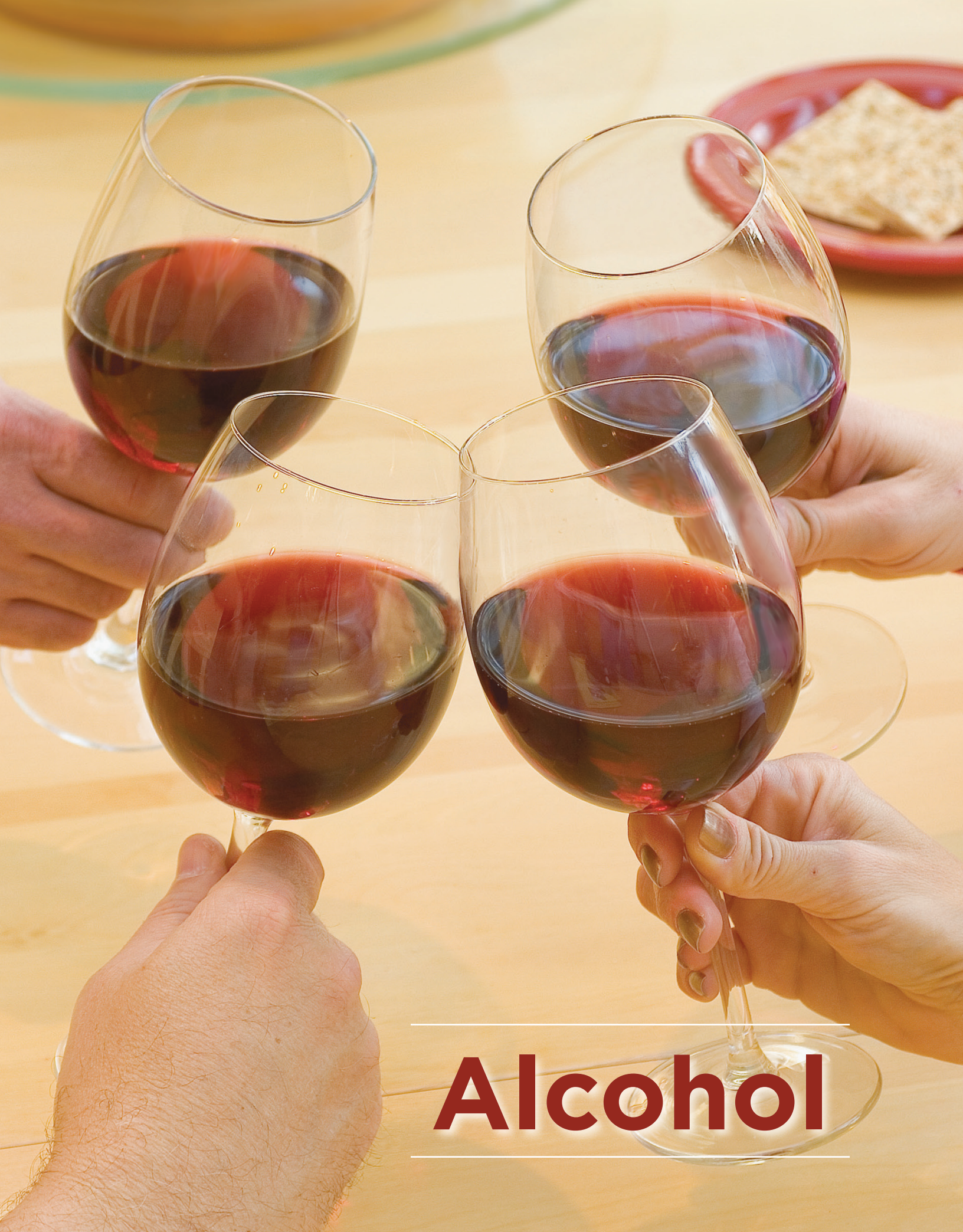
NOTES

January 9, 2017: Federal Trade Commission, New York State Charge the Marketers of Prevagen With Making False and Unsubstantiated Claims about Memory

"The marketing for Prevagen is a clear-cut fraud, from the label on the bottle to the ads airing across the country," said the New York Attorney General. "It's particularly unacceptable that this company has targeted vulnerable citizens like seniors in its advertising for a product that costs more than a week's groceries, but provides none of the health benefits that it claims."

Case will be decided by a federal district court judge

NOTES



Alcohol

ALCOHOL

Most commonly used substance among older adults although overall use declines with age

Over age 60, 53% of men and 37% of women drink regularly

At-risk drinking (defined as more than 3 drinks on one occasion or more than 7 drinks per week) is responsible for more harm than alcohol disorders in older adults

NOTES

Older adults have higher blood alcohol concentrations and increased impairment compared with younger adults at the same amount and with less awareness of their impairment ***(Oslin, 2000; Gilbertson, 2009).***

Driving skills can be impaired by blood alcohol concentrations (BACs) as low as 0.02 percent. A 160-pound man will have a BAC of two times the legal limit one hour after drinking two standard drinks on an empty stomach.

Important to know your "new" limit with alcohol

NOTES

At-risk drinking can trigger or exacerbate additional serious problems in older adults

- Increased risk of hypertension, cardiac arrhythmia, myocardial infarction, and cardiomyopathy
- Increased risk of hemorrhagic stroke
- Impaired immune system and capability to fight infections
- Decreased bone density
- Gastrointestinal bleeding
- Depression, anxiety, and other mental health problems
- Worsened hearing and vision loss
- Mixing alcohol with many over-the-counter and prescription medicines can be fatal

NOTES

MIXING ALCOHOL WITH OTHER SUBSTANCES

Both prescribed and OTC medications, especially pain meds, benzodiazepines, anticonvulsants and antidepressants are dangerous ***(Oslin, 2004).***

In a survey of 83,321 older adults, 19% of those taking prescription medications known to negatively interact with alcohol reported regular alcohol use ***(Pringle, 2005).***

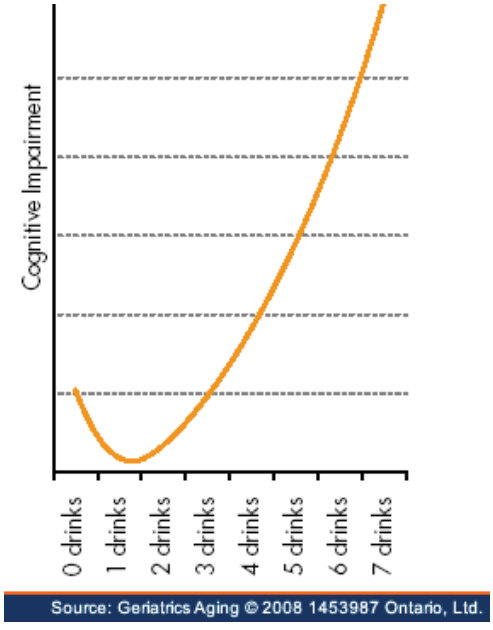
NOTES

HOW DOES ALCOHOL AFFECT THE BRAIN?

- Neurotoxic
- Cerebellum, memory and emotional centers most vulnerable in short and long term
- Heavy alcohol consumption causes reductions in the size of brain cells; brain shrinks
- A gene that raises the risk of Alzheimer's disease (APOEε-4) seems to have a modifying effect: carriers who drink any alcohol are 3 times more likely to develop AD than non-drinking carriers and carriers do not show the benefit from light drinking ***(Luchsinger, 2004; Antilla, et al., 2004)***

NOTES

Cognitive function in adults has been shown to have a J-shaped relationship with level of alcohol intake. Light to moderate drinkers have generally superior cognitive function than abstainers and heavy drinkers ***(Espeland, 2006).***



(Espeland , 2006)

NOTES

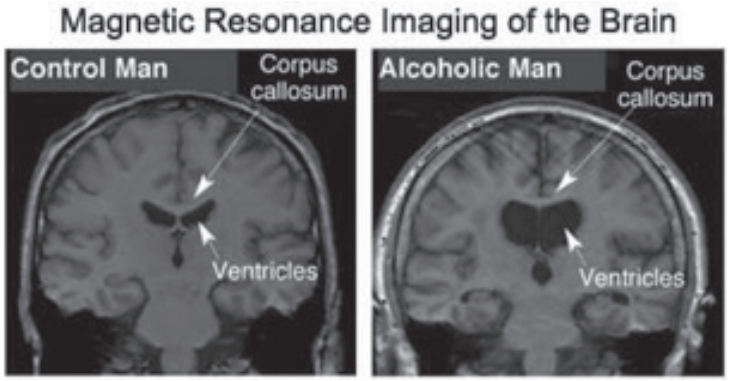


Image courtesy of the National Institute on Drug Abuse

ALCOHOL-RELATED DEMENTIA

Moderate to high alcohol consumption is one of the risk factors for development of dementia prior to age 65.

Saunders, et al. 1991 found a 4.6 times greater risk of dementia for community-dwelling men over 65 who had a history of heavy drinking.

20 year rule

NOTES

There is a gradual improvement in brain functioning, including cognitive ability with prolonged abstinence no matter your age.

Abstaining from alcohol over several months to a year may allow brain changes to partially correct.

Acute deficits in executive functioning (poor impulse control, not the best decision making) and learning may to lead to poor outcomes, even in individuals who appear to be healthy and wish to limit their drinking.

NOTES

I CARE FOR YOUR BRAIN

with Dr. Sullivan

Recommendations

ASK FOR AN ANNUAL MEDICATION REVIEW

- Medication review should occur at every visit, including all of your vitamins, OTC's and herbs/supplements.
- Ask questions when a new medication is recommended. Each new medication adds more than one adverse drug event per year and taking 6 or more medications increases this risk times 4.
- Ideally, your PCP should prescribe all medications, because each additional prescriber increases the risk of adverse drug events in older adults by 30%.
- Always use the same pharmacist
- Use a pillbox

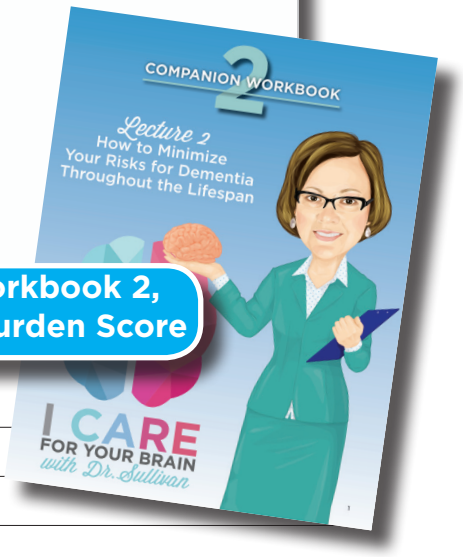
"START LOW AND GO SLOW"

- Have to balance benefits/risks of all medications
- Start one medication at a time when you can
- Ideally, start with a low dose and increase gradually
- Monitor for good response and side effects but beware of placebo and nocebo effects

KNOW YOUR ANTICHOLINERGIC BURDEN SCORE

ANTICHOLINERGIC COGNITIVE BURDEN SCALE
available at

www.agingbraincare.org



Check out the I CARE FOR YOUR BRAIN Companion Workbook 2, PAGE 54-55, to calculate your personal Anticholinergic Burden Score

NOTES

TAKE IT EASY WITH ALCOHOL

Guidelines provided by the American Geriatrics Society and the National Institute for Alcohol Abuse and Alcoholism recommend that older adults drink no more than 3 standard drinks per day and 7 per week

Especially if you have a strong family history of Alzheimer's disease

Red wine issue

If you can't do it on your own, ask your PCP for help

One Standard Drink is:

12 oz. Beer
5% alcohol

5 oz. Wine
10-12% alcohol

3 oz. Fortified Wine
16-18% alcohol

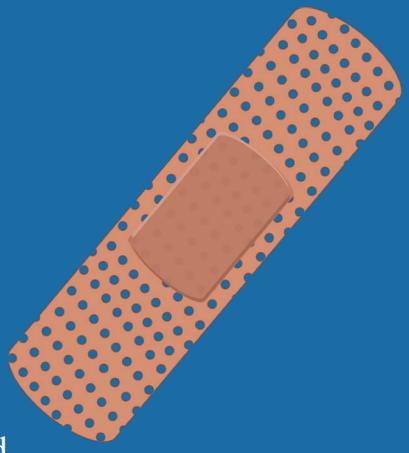
1.5 oz. Liquor
40% alcohol

Supplements:

More is not better

- If the risks and costs are low, you might consider trying it.
- If the risks or costs are high, don't chance it.
- Don't assume that something that is "natural" is safe.
- More is not better!
- Strive to get your nutrients from whole foods.
- The Academy of Nutrition and Dietetics advises older adults should pay special attention to their intake of calcium, vitamin D, vitamin B-12, potassium and fiber in their diet.
- Advisable when there is evidence of serious deficit (vitamin B12, vitamin D deficiency)

TRY TO MANAGE YOUR PAIN BETTER



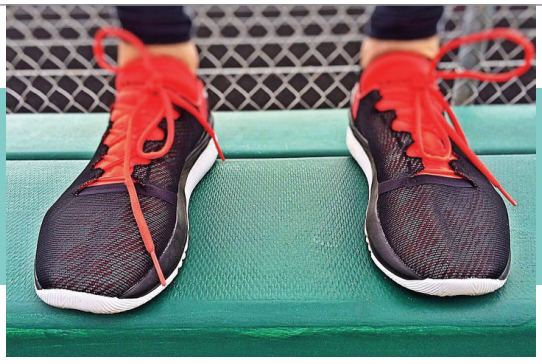
- Increase circulation (massage, exercise, heat)
- Power of positive thinking
- Acetaminophen is likely the safest of all of the medications used for pain and is approximately as strong as oral opioids ***(Gaskell, Derry, Moore, & McQuay, 2009; Toms, McQuay, Derry, & Moore, 2008).***
- Acetaminophen can cause liver damage when used in higher doses for long periods of time. More likely in those who regularly use other liver-toxic drugs (alcohol).

NON-DRUG RELIEF OF ANXIETY

- Increase positive coping skills
- Deep breathing
- Talk about your feelings
- Professional support

NON-DRUG RELIEF FOR SLEEP

- **Sleep hygiene**
- **No devices one hour before bed**
- **If you use melatonin:**
  - Less is more (keep the dose close to the amount that our bodies normally produce, < 0.3 mg per day).
  - Talk to your doctor about sustained release with synthetic ingredients
  - Take about an hour before bed
  - Only for short-term use, up to two months max
  - Not evaluated by the FDA for safety, effectiveness, or purity



OUR OL' FRIEND EXERCISE AGAIN

Increase muscle mass

Encourage circulation

Improved processing and excretion of substances

SMALL GROUP DISCUSSION TOPICS

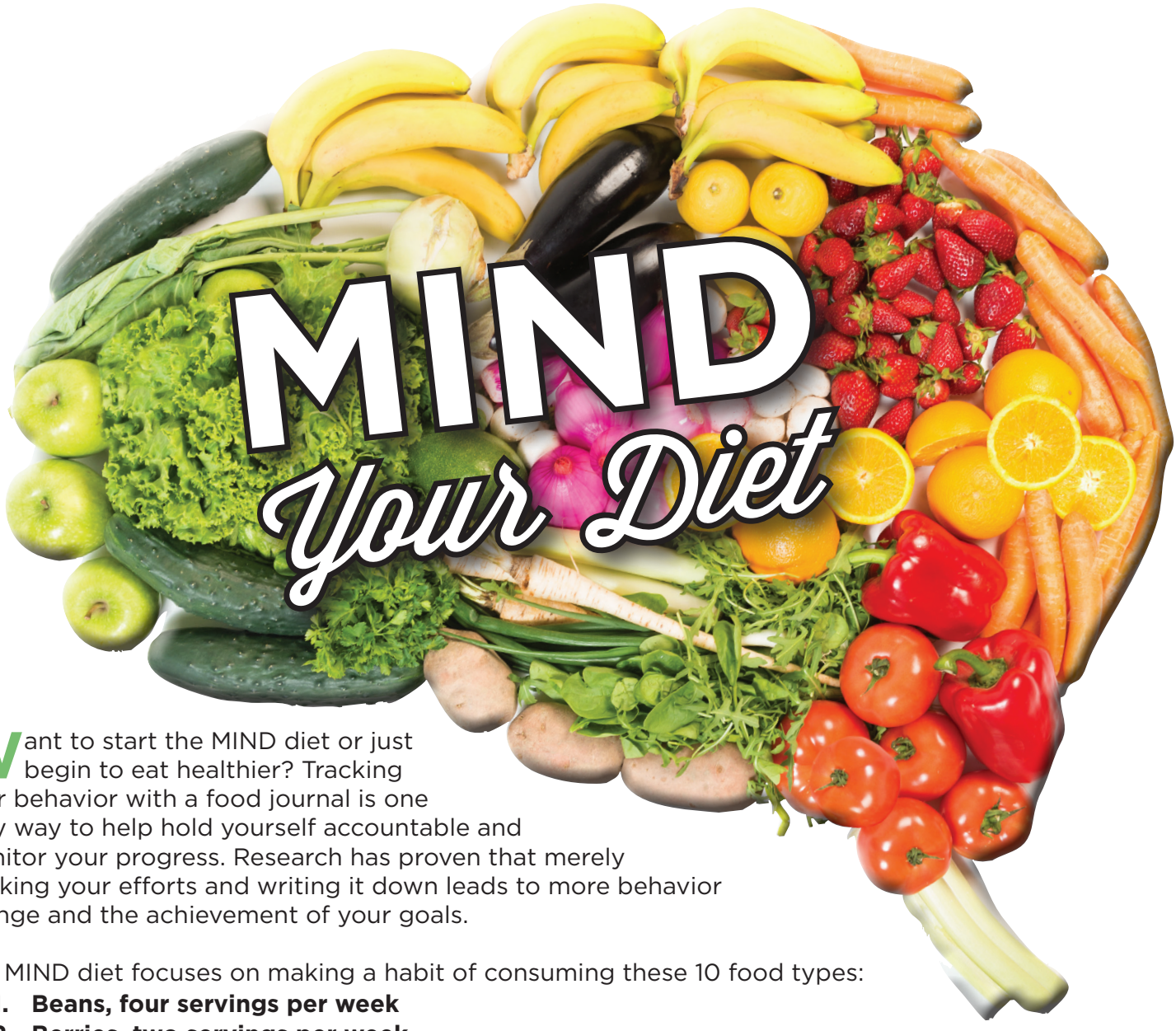
1. Why is it important to you to understand changes in your body's ability to absorb, distribute, metabolize and excrete substances as you age?

2. Have you ever felt that you have been prescribed too many medications? Why do you think that is?

3. Did this lecture make you think about your use of over-the-counter drugs differently? How?

4. Have you noticed that alcohol affects you differently now than it did when you were younger? Can you describe the difference?

5. Discuss some of the ways pain can be managed without medication.



MIND Your Diet

Want to start the MIND diet or just begin to eat healthier? Tracking your behavior with a food journal is one easy way to help hold yourself accountable and monitor your progress. Research has proven that merely tracking your efforts and writing it down leads to more behavior change and the achievement of your goals.

The MIND diet focuses on making a habit of consuming these 10 food types:

1. **Beans, four servings per week**
2. **Berries, two servings per week**
3. **Fish, one serving per week**
4. **Green leafy, vegetables, one serving per day**
5. **Nuts, one snack per day**
6. **Poultry, two servings per week**
7. **Olive oil, use as main cooking oil**
8. **Vegetables, one or more servings daily**
9. **Whole grains, three servings daily**
10. **Wine, maximum of one serving daily**

"What gets measured, gets managed."

—PETER DRUCKER

Make an effort to limit or stop eating these unhealthy foods:

1. **Butter, no more than 1 tablespoon daily**
2. **Cheese, one or less serving per week**
3. **Fried food/fast food, one or less serving per week**
4. **Red meats, no more than three servings per week**
5. **Sweets/pastries, no more than 4 times per week**

Take Dr. Sullivan's Food Tracking Behavior Tracking Challenge for one week and monitor your progress.

FOOD JOURNAL *for Better Brain Health*

DATE	BREAKFAST	LUNCH	DINNER	SNACKS	DRINKS	WATER

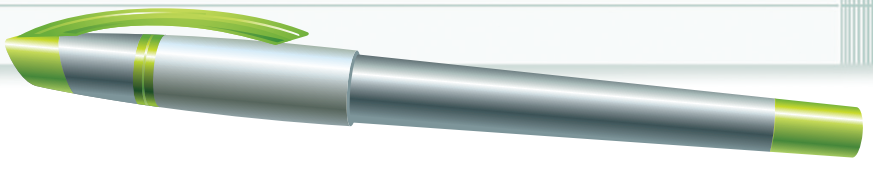
Prescriptions, Over-the-Counters, Supplements & Alcohol TRACKER

Use this tracking sheet, or grab a legal pad and a pen and make your own with these categories. Keep track of everything you consume: prescriptions, over-the-counter drugs, vitamins or supplements, and alcohol for a week. Bring this list to your next primary care appointment or trip to see your pharmacist, and ask for a medication review to make sure there are no known adverse reactions.

Week of:

Prescription Medications	Over-the-Counter Drugs	Vitamins & Supplements	Alcohol Consumed

- Tell your primary care doctor provider and pharmacist everything on this list.
- Don't forget supplements and over-the-counter medications are drugs, too!
- Use a pillbox, so you don't under or overtake your medications.



Brain Trivia

COMPANION WORKBOOK 4

1. What does it mean when a risk factor is modifiable? _____

2. TRUE OR FALSE:

_____ Younger adults use more prescription and non-prescription drugs than older adults.

_____ Using more than five drugs is called polypharmacy and becomes more common in older adults.

_____ Approximately half of hospital admissions in older adults are associated with prescription medications.

3. List 4 things that make older adults unique regarding their reactions to substances.

_____ _____

_____ _____

4. TRUE OR FALSE: _____ Do not stop taking any medications without your doctors' agreement.

5. More medications usually means more _____ illnesses, increased likelihood to make administration _____, and more chances for unanticipated _____.

6. _____% increased risk of falls in older adults who take opioids for pain.

7. Opioids following an injury can _____ recovery and increase the risk of _____ disability.

8. FILL IN THE BLANKS USING THE WORDS BELOW:

attention	**anxiety**	**delirium**	**memory**	**cognitive**
relaxation	**reaction time**	**habit-forming**	**cognitive behavior therapy**	

Benzodiazepines are medications used to treat _____, and sleep, primarily.

They are typically intended for short-term use; however, they can be _____.

In older adults, benzodiazepines have been shown to result in poor _____ storage, decreased _____ and decreased _____.

Benzodiazepines increase the risk of _____.

The research results on the risk of long-term benzodiazepine use are conflicting. Overall, the research suggests risk of _____ impairment and increased risk of Alzheimer's disease.

Older adult advocates believe there are safer alternatives for the management of anxiety and insomnia, including _____ and _____ techniques.

9. TRUE OR FALSE

_____ Adults over 65 years of age are the largest users of over-the counter medications.

_____ Twice as many prescription drugs as over-the-counter drugs are being used by older adults.

_____ According to Dr. Sullivan, the biggest issue with over-the-counter medications is that people do not take their use seriously and forget that they are drugs.

10. Especially in those with pre-existing cognitive impairment, there is increasing evidence that more more cognitive decline, physical impairment and increased risk of death are associated with a high _____ burden.

11. TRUE OR FALSE

_____ According to the AARP, more than 40 percent of older adults take at least one supplement.

_____ There is limited evidence to support claims of the effectiveness of supplements.

12. Some companies have claimed that coconut oil can treat/prevent Alzheimer's disease and improve brain health. Is this claim well supported by objective research? _____

13. In 2017, the most comprehensive critical review of curcumin, the active ingredient in turmeric, found _____ _____ of any specific therapeutic benefits.

14. What hormone, naturally produced by the body, helps us fall asleep and stay asleep?_____

15. What is the most commonly used substance among older adults? _____

16. At risk drinking can trigger or exacerbate additional serious problems in older adults. List two of these:
_____ _____

17. TRUE OR FALSE: _____ There is no medical risk when mixing alcohol with medications.

18. Heavy alcohol consumption causes _____in the size of brain cells and _____ the brain.

19. TRUE OR FALSE: _____ Moderate to high alcohol consumption is not a risk factor for the development of dementia prior to the age of 65.

_____ There is a gradual improvement in brain functioning with prolonged alcohol abstinence, no matter your age.

20. Dr. Sullivan recommends you ask for a medication review from your doctor at each visit. What information should be discussed with your doctor during a medication review?

_____

21. List two ways that you can help reduce your chances of adverse drug reactions?
_____ _____

22. Is it considered better to get nutrients from whole foods rather than supplements when possible? _____

23. Dr. Sullivan recommends that people try to increase pain management with positive thinking and activities that increase circulation, like massage, exercise, and heat. What ways have you used, beside medication, to help manage pain in the past? Do you feel that they have helped you deal with your pain?

_____

24. List three ways that you can relieve anxiety, besides medication.

_____ _____ _____

25. What ways can you change your bedtime routine to help improve your sleep? _____

_____

Brain Trivia Answers

1. It is a risk factor that you can change.

2. FALSE: Younger adults use more prescription and non-prescription drugs than older adults

TRUE: Using more than five drugs is called polypharmacy and is more common in older adults.

TRUE: Approximately half of hospital admissions in older adults are associated with prescriptions.

3. Any four of the following: changes in the body's ability to absorb, distribute, metabolize and excrete substances as we age; less muscle mass, less water in body, decreased functioning of liver and kidneys, decrease in blood flow; blood-brain barrier is more permeable; chronic illness is more common; older adults and individuals with significant comorbidities are often excluded from clinical trials that are used to develop medications

4. TRUE

5. More medications usually means more chronic illnesses, increased likelihood to make mistakes, and more changes for unanticipated interactions.

6. 64%

7. Opioids following an injury can delay recovery and increase the risk of permanent disability.

8. Benzodiazepines are medications used to treat anxiety and sleep, primarily.

They are typically intended for short-term use; however, they can be habit-forming.

In older adults, benzodiazepines have been shown to result in poor memory storage, decreased attention and decreased reaction time.

Benzodiazepines increase the risk of delirium

Overall, the research suggests risk of cognitive impairment and increased risk of Alzheimer's disease.

Older adult advocates believe there are safer alternatives for the management of anxiety and insomnia, including cognitive behavior therapy and relaxation techniques.

9. TRUE: Adults over 65 years of age are the largest users of over-the counter medications.

FALSE: Twice as many prescription drugs as OTC drugs are being used by older adults.

TRUE: According to Dr. Sullivan, the biggest issue with OTC medications is that people do not take their use seriously and forget that they are drugs.

10. Especially in those with pre-existing cognitive impairment, there is increasing evidence that more cognitive decline, physical impairment, and increased risk of death are associated with a high anticholinergic burden.

11. FALSE: According to the AARP, more than 40 percent of older adults take at least one supplement.

TRUE: There is limited evidence to support claims of the effectiveness of supplements.

12. No. There is inadequate evidence that coconut oil is effective for treating any brain condition.

13. In 2017, the most comprehensive critical review of curcumin, the active ingredient in turmeric, found no evidence of any specific therapeutic benefits.

14. Melatonin

15. Alcohol

16. Any two of the following are correct: increased risk of hypertension, cardiac arrhythmia, myocardial infarction and cardiomyopathy; increased risk of hemorrhagic stroke; impaired immune system and capability to fight infections; decreased bone density; gastrointestinal bleeding; depression, anxiety and other mental health problems; worsened hearing and vision loss

17. FALSE: Mixing alcohol with many over-the-counter and prescription medications is dangerous and can be fatal.

18. Heavy alcohol consumption causes reductions in the size of brain cells and shrinks the brain.

19. FALSE: Moderate to high alcohol consumption is not a risk factor for the development of dementia prior to the age of 65.

TRUE: There is a gradual improvement in brain functioning with prolonged alcohol abstinence, no matter your age.

20. Discuss prescription medications, vitamins, OTC drugs, and herbs/supplements. Ideally, your PCP should prescribe all medications.

21. Use the same pharmacist, use a pillbox organizer

22. Yes

24. Positive coping skills, deep breathing, talking about feelings and seeking professional support

25. Not using electronic devices for one hour before bed, set a sleep schedule, exercise, improve bedroom comfort, etc.

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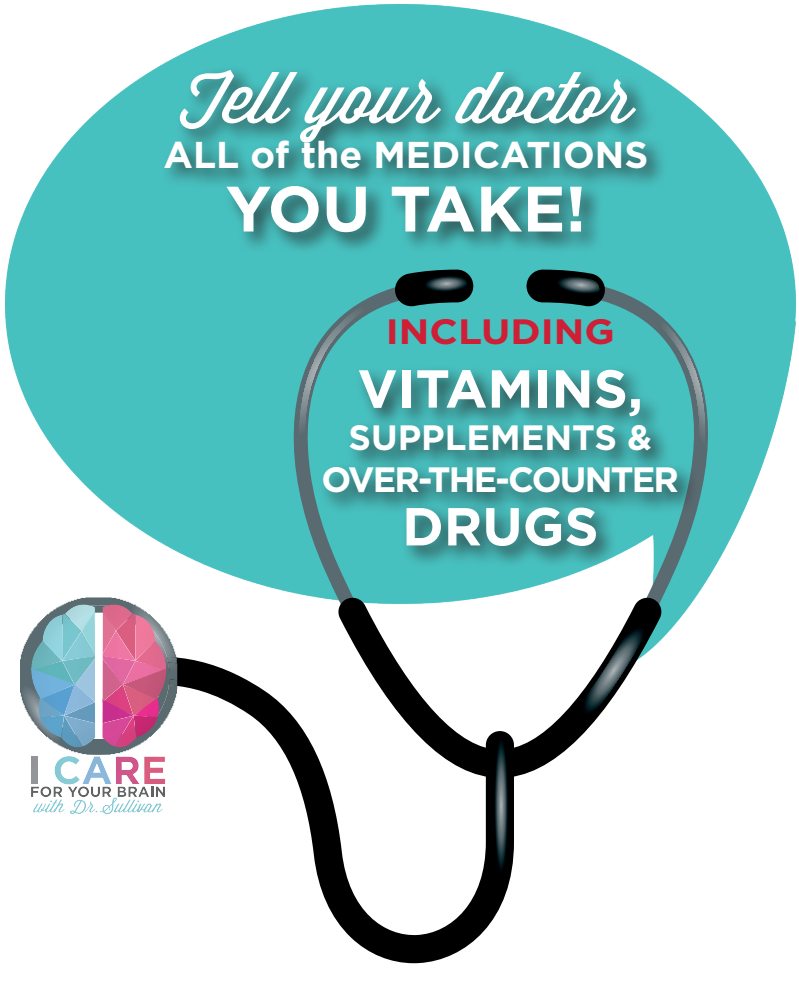
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