



Restorative Vitality Sleep Program (RSVP)

“Sleep is that golden chain that binds health and our bodies together.” - Thomas Dekker

This pilot project is made possible through a grant from the Colorado Innovation Grant Board

Objectives

Discuss the importance of undisturbed sleep, active engagement during wake times, and the need for both in Skilled Nursing Communities.

Describe interventions which will be utilized in the Restorative Sleep Vitality Program Pilot.

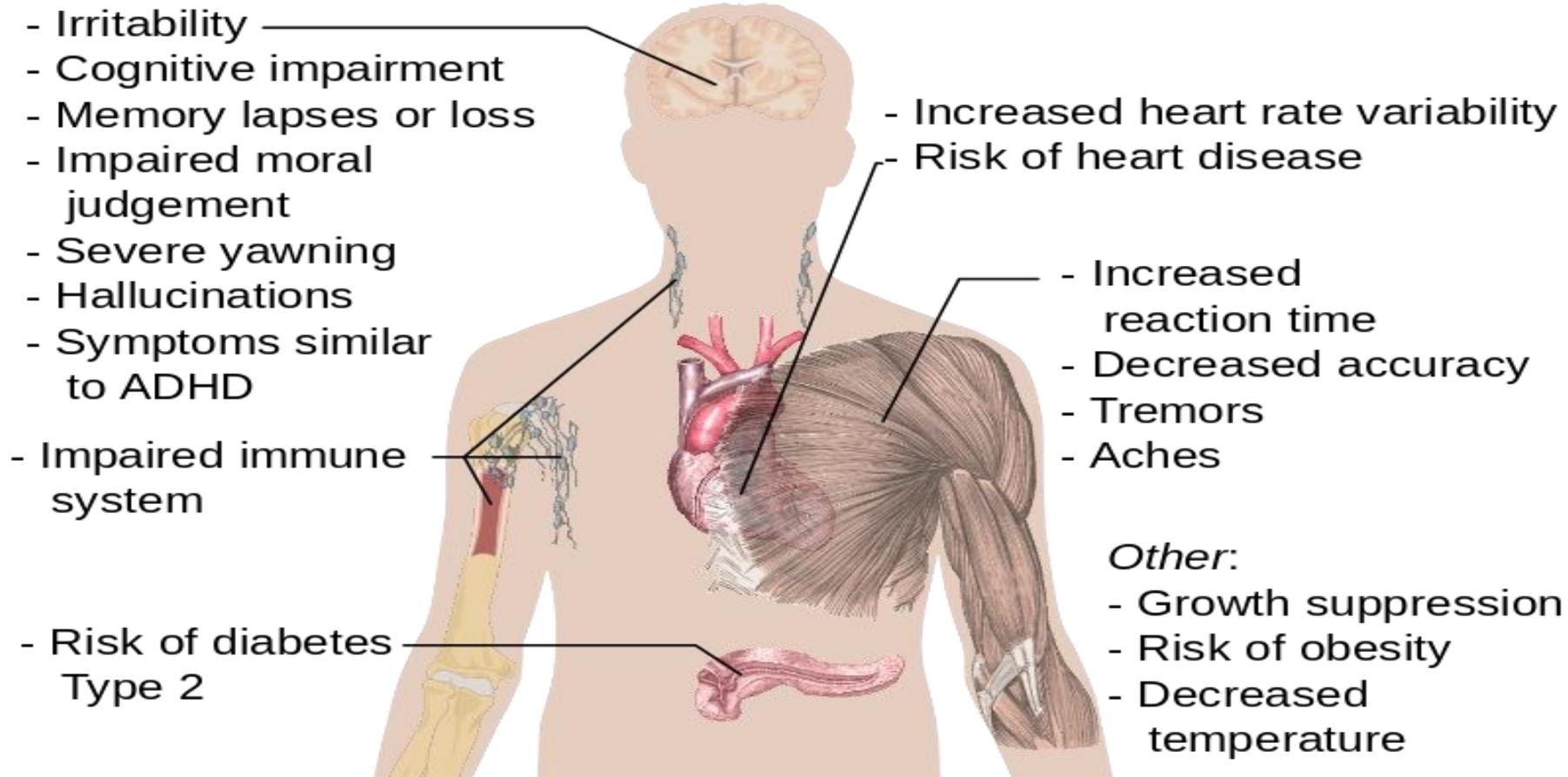
Undisturbed Sleep

VIVAGE Senior Living staff and home office representatives attended a national evidence-based training presented by Sue Ann Guildermann, RN, BA, MA Director of Education with Empira, on best practices for improving sleep hygiene. Empira conducted a two-year study on undisturbed sleep in their care communities in the Midwest. Their results were extraordinary.

After learning from Sue Ann the response to take action for change in the way we approach sleep hygiene in VIVAGE Senior Living Communities was unanimous. Three Vivage communities have volunteered to participate in this pilot program.

The following training is from the teachings of Sue Ann Guildermann, 2016.

Effects of Sleep deprivation



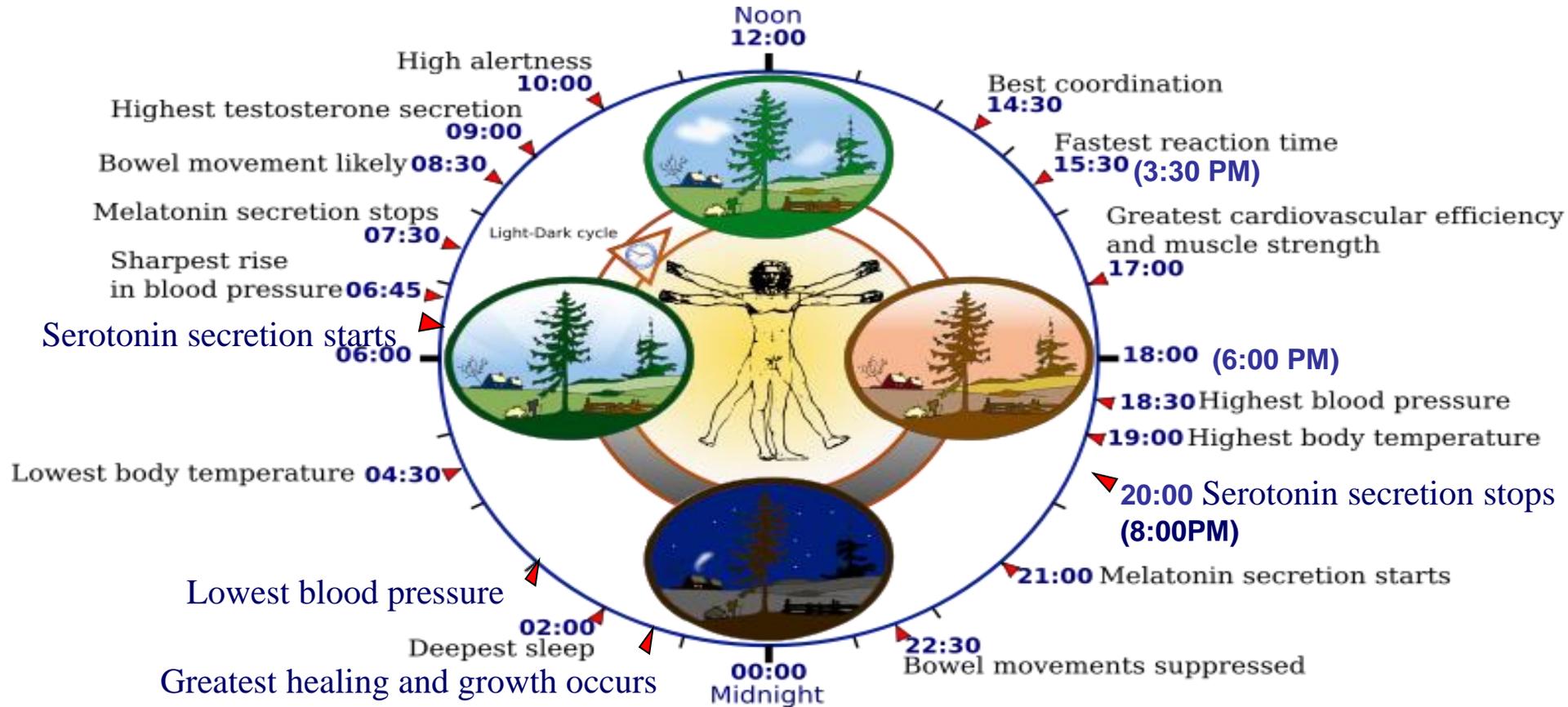
The Etiology of Sleep and Wake:

To understand the importance of undisturbed sleep we must first understand how our bodies are designed to sleep and wake, what are the negative effects of sleep deprivation and/or sleep fragmentation and what hormonal, biochemical compounds are affected by sleep/wake cycles.

Circadian Rhythm: the body's internal clock

An inborn, internal, 24-hour cycle of change and fluctuation of the physiological, behavioral emotional functions of the human body.

Human Biological Clock: Ideal 24 Hours



Biochemical & Hormonal Properties of the Sleep/Wake Cycle

**Melatonin =
hormone**



**Serotonin =
biochemical**

Melatonin: sleep hormone

Melatonin is a hormone. It is secreted by the pineal endocrine gland in the brain. It's shape is a tiny pine cone.

The pineal gland, receives electrical messages to secrete melatonin which then sends information about the lighting levels to other parts of the body to either induce sleep (more melatonin) or to wake up (less melatonin).

Melatonin is triggered by darkness:

> Darkness = more melatonin produced; heart rate slows, body temperature drops, eyes stop moving, brain waves slow, blood pressure lowers, peristalsis relaxes, muscles relax, etc.

> Lightness = less melatonin produced; reversal occurs

Melatonin

Is a potent antioxidant that protects the body from free-radical damage

Some foods contain small amounts of melatonin: olive oil, tomatoes, grape skins, tart cherries, walnuts, wine & beer

Melatonin can be purchased in 1, 3, 5, 10 milligram tablets OTC

50 year olds secrete approx. 50% less melatonin than 25 y.o.

75 y.o. secrete approx. 75% less melatonin than 25 y.o.

Serotonin: wake biochemical

Serotonin: “happy, feel good” biochemical.

About 90% of human body's total serotonin is located in the gastrointestinal tract, where it regulates intestinal movements and digestion.

The remaining 10% is stored in the brain where it regulates mood and provides a sense of well-being and happiness.

It also helps to regulate appetite, wakefulness, sleep, and the cognitive functions of memory and learning.

Serotonin

Serotonin is also a growth factor for some cells, which gives it a role in healing, especially wound and skin healing.

**Serotonin is triggered by bright light. More light = more serotonin produced
Less light = less serotonin produced.**

B complex vitamins, such as thiamine and folic acid increase serotonin production

Foods rich in vitamin B are brown rice, wheat germ, whole grain cereals, yeast extracts

Serotonin

**The brain uses the protein tryptophan to produce serotonin.
Less tryptophan = less serotonin!**

Certain foods may raise serotonin levels because they contain tryptophan: salmon, fresh tuna, snapper, sardines, herring, mackerel and halibut, poultry

It is particularly plentiful in eggs, cod, tuna, shellfish, soy (and soy products) pumpkin seeds, sesame seeds, chickpeas, sunflower seeds, peanuts, chocolate, oats, dried dates, milk, yogurt, cottage cheese, red meat, and poultry.

Tryptophan

Tryptophan is an essential amino acid, which means it is not produced by the body but rather must come strictly from the diet.

Tryptophan serves as a precursor for serotonin.

In the absence of tryptophan, serotonin can not be utilized by the body.

In the brain, tryptophan converts serotonin. In fact, the only source for serotonin in the brain is tryptophan. If there is not enough tryptophan in the diet, it can lead to anxiety, depression and insomnia.

For Our Circadian Rhythm:

We need 30 minutes of direct, full sunlight each day to set our circadian rhythm:

Or 60 minutes of indirect sunlight

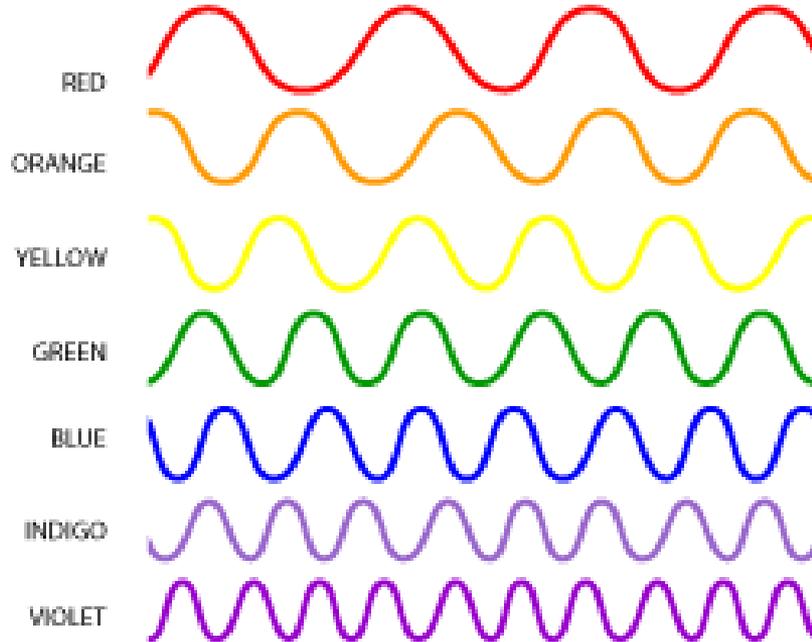
Or 120 minutes of filtered/overcast sunlight

The sunlight (direct, indirect or filtered) needs to hit the retina of the eye

Therapeutic artificial light to replace or enhance the lack of sunlight has had mixed success for setting the circadian rhythms.

For Our Circadian Rhythm:

We need to consider the color of lighting residents are exposed to. Light comes in waves and colors. The warmer the color, the longer or slower the wave link.



Blue Light in the Morning

Popular treatment for sleep disorders focus on "blue light in the morning"

Research consensus includes "avoiding blue light within two hours of sleep"

Researchers agree that the more rapid wavelength of blue light can delay the onset of sleep because it suppresses the production of melatonin, increases cardiac output, increases all vital signs

Warmer, slower light for better sleep

Research indicates that slower wavelength light (red, amber, yellow) creates a gentle, gradual lowering of the central nervous system activity and a lowering of brain wave activity

Red, amber, yellow light would be more effective in a bedroom or a similar environment where it is desirable to lower physiological and mental activity

Examples of everyday light:

Candlelight / fireplace
Older incandescent bulb
Fluorescent lights
White (sunlight) light bulbs
Energy efficient bulbs
Cell phones
HD flat screen TVs
Computer/laptop screens
Halogen lights
LED lights

Red

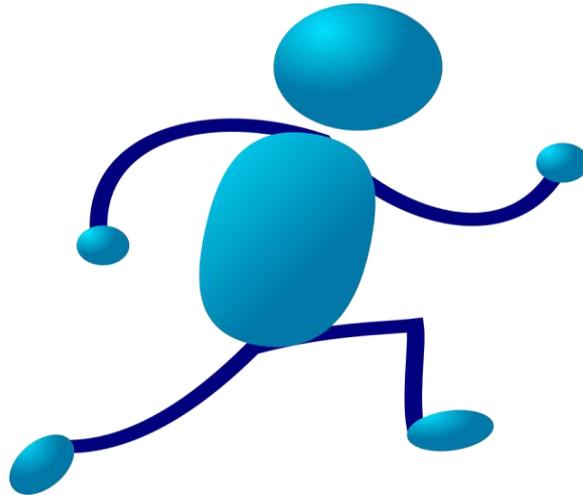


Blue

Activity, Movement and Exercise: Another influence on Sleep & Wake

How much do we move, exercise?

When do we move, exercise?



*Human Body is like a Rechargeable Battery

Manufacturer's recommendation on rechargeable battery:

“To extend the life of the battery: fully exhaust or run down the battery prior to recharging.”

When we sleep we recharge our cells, but we need to run down the cells during the day, to get the best recharge at night.

We get better sleep at night, when we are physically exhausted from the day's activities.

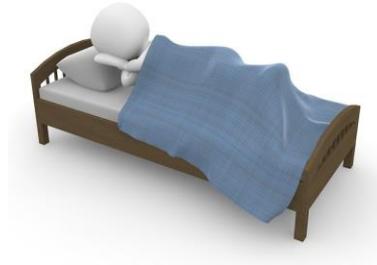
Exercise & Activity & Sleep

Exercising right before bed or within about three hours of your bedtime can actually make it harder to fall asleep

When it comes to having a direct effect on getting a good night's sleep, it's exercise in the late afternoon that appears most beneficial to sleep

Is too much sleep better or worse for you?

- **What about sleep lasting > than 9 hours?**
- **What about resting in bed for > than 9 hours?**



The human body has evolved to function optimally in the upright position for about 16 hours a day. Average adult sleeps 7 to 8 hours a day, usually in a supine position.

Consistently sleeping for more than 9 hours or fewer than 8 hours a day has a negative impact on physiological, psychological and cognitive function. (Van Dongen et al, 2003)

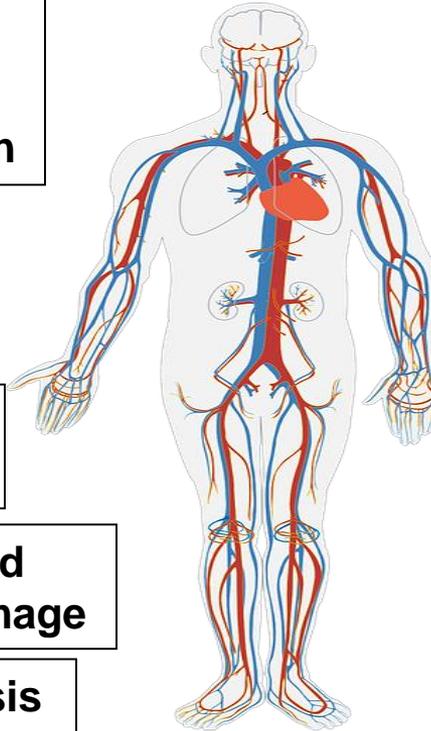
**dehydration,
progressive cardiac
de-conditioning,
postural hypotension**

**reduced lung function,
increased susceptibility
to respiratory infection**

**urinary retention,
increased risk of UTIs**

**venous stasis and
blood vessel damage**

osteoporosis



**increased anxiety, confusion and
depression, impaired memory function**

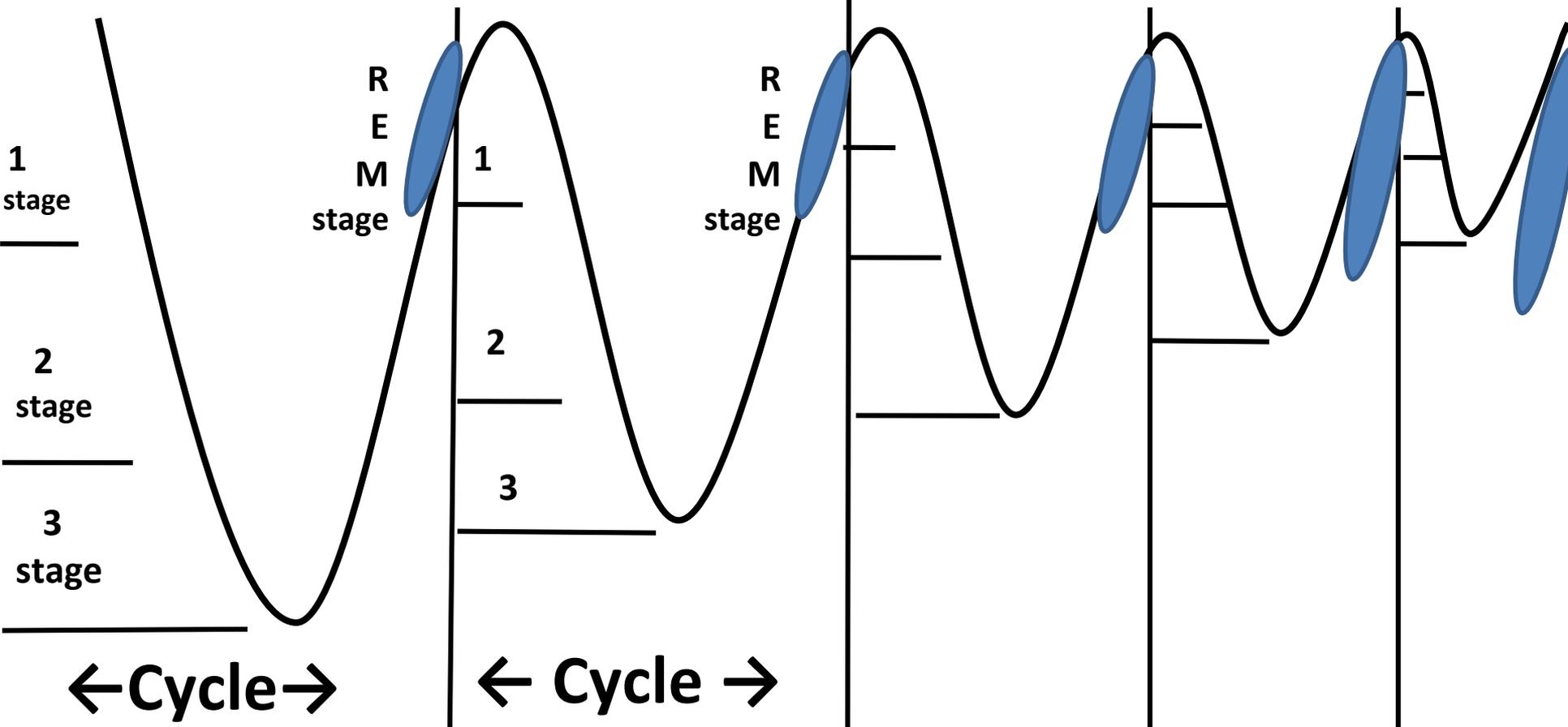
**progressive slowing down of metabolic
rate, reduction in insulin sensitivity**

**gastric reflux and
constipation**

loss of muscle strength and endurance

altered skin integrity

← One night of 7 – 8 hours of sleep →



Sleep: Cycles & Stages

- **In humans, an average 7 – 8 hour night's sleep should contain 4 – 5 sleep cycles.**
- **Each cycle should last 90 to 120 minutes.**
- **Each cycle has 3 Non-REM stages and 1 REM stage of sleep.**

Each stage provides distinct physiological and emotional benefits for the body.

Elders Sleep Basics

Stage one is light & shallow sleep

Stage two sleep is “average sleep” - not too light and not too deep

Cell healing and regeneration occurs in stage three, which elders spend little of their sleep time in.

REM sleeps occurs in 90 min cycle and is important for concentration and memory formation.

Sleep Fragmentation

- Different than sleep deprivation (not getting enough sleep)
- Fragmentation = Interrupted sleep, frequent awakenings
- Just as harmful as sleep deprivation
- **New research** - associated with a higher risk of severe arteriosclerosis (hardening of the arteries) in elderly people. In addition to this, these individuals were found to be at greater risk of having brain infarction. Both arteriosclerosis and infarction can lead to cognitive impairment and stroke.

Sleep Fragmentation

- Disruptions in sleep cycles, no matter how brief, prevent the person from entering the 3rd stage and REM stages.
- Stage N3 is where the greatest amount of skin, deep tissue and overall healing and regeneration of the human body occurs.
- The greatest amount of healing occurs at this stage due to the greatest formation of white blood cells, T4 cells, red blood cell re-oxygenation and cellular repair and regeneration.
- REM stage is where memory is cemented into our brains.
- New research - also diminishes the benefits of the first two sleep cycles.

Alzheimer's and Dementia

- **40% have sleep disturbances**
- **Phase delay (onset of sleep period occurs later and waking in morning is difficult)**
- **Fragmented sleep – more rapid sleep cycles and more awakenings between sleep cycles**
- **Spend more time in stage 1 and 2 and ↓ in 3 and REM**

McCurry et al, 1999; Moren et al 2005

**What disturbs sleep
the most?**

Top Disturbances to Sleep

1. Noise
2. Light
3. Sleeping Environment: surface, temp, bedding, aroma
4. Napping
5. Medications
6. Continence Needs
7. Pain
8. Positioning
9. Inactivity/activity
10. Diet

What is needed in Long Term Care environments to support sleep hygiene and decrease sleep fragmentation:

- **An environment (lighting, noise,) which promotes sleep at night and purposeful activities during the day.**
- **A general understanding of how Melatonin, Serotonin and Tryptophan influence sleep hygiene.**
- **The importance of getting outside at least for short intervals throughout the day.**
- **A change in practices that are fragmenting residents' sleep.**

Implementing the VIVAGE Restorative Sleep Vitality Program

What disturbs sleep? And what keeps people awake?

Identify environmental factors.

Identify clinical factors.

Identify operational factors.

We will also measure how well each resident is actually sleeping.

Measurements and Tests for Sleep:

- Sleep, its stages and characteristics, can be assessed by tests in sleep labs.
- Tests that identify the sleep and wake cycles include, Polysomnography:
 - Electroencephalogram (EEG) measuring the electrical activity of the brain, or brain waves
 - Electrooculography (EOG) measuring eye movements
 - Electromyography (EMG) measuring the skeletal and muscle activity/tonicity
- Or by Actigraphy

Actigraphy:



- **Measures Rest and Sleep**
- **Measures Activity and Tonicity**
- **Measures Light Source and Quantity of Light source**
- **Over a 24 Hour Period**
- **Worn continuously for multiple days**
- **Worn on the wrist**
- **Cost effective**

Noise: Goals

We will attack noise by:

Auditing and monitoring sound levels with the use of sound meters

Identify root causes and types of noise

Eliminate residents' personal alarms

Reduce noisy times: shift change, meals, rounds

Reduce noisy areas: nurses' areas, dining rooms, halls

Identify specific loud speaking staff

**Turn off TVs when not being watched,
encouraged use of private TVs w/ headsets**

Ongoing use of "Yacker Trackers" →



Lighting: Goals

Higher intensity level, lighting during day time (8 am → 8 pm)

Lower intensity level, lighting at night (8 pm → 8 am)

Turning off the lights. Some lights will always stay on.

Hug lights used by night staff, flashlights with amber light

We will install motion-sensored night lights in each resident room. If a resident gets out of bed, the light will come on.

Get residents outside during day

NAPS

Naps rob the sleep at night

Naps rob stage 3 sleep

One 30 – 40 minute nap during mid-day is rejuvenating and beneficial to health & longevity

Consistently napping for longer periods, nearly every day, results in an increase of illnesses and a shorter life expectancy

Consolidate the sleep experience so you sleep deeply at night and stay awake during the day

Medications:

Schedule meds not to awaken sleeping resident at night

Identify which medications support sleep and which medications disturb sleep

Give medications during day time that have positive effect on wakefulness & medications in the evening that help sleep

Pain: Goals

- Alternative comfort and pain relieving interventions other than medications
- Medicate to facilitate pain relief AND sleep
- Long acting pain medication lasting all night – given prior to sleep!
- Schedule routine rather than PRN meds

Incontinence & Repositioning: Goals

Extend periods of uninterrupted sleep at night

Reduce disturbance of sleep at night to urinate, change or reposition the resident

Assess skin conditions for tolerating longer and longer periods of not being repositioned without causing untoward effects on skin

Allow sleep without changing incontinent product or taking resident to the bathroom AND not resulting in any negative outcomes

Continence & Repositioning; or why do we need to urinate at night?

- Kidneys remove fluid from the body all day
- When we are awake, our upright or sitting position challenges our kidneys to remove fluid from our extremities because it is working against gravity
- But when we lie down into a supine position it is easier for the kidneys to pull fluid from our limbs because it is not fighting gravity
- So we may need to urinate in the middle of the night

Incontinence:

Hydration control & Product use

Bulk fluid intake in the morning, taper down after lunch, least fluids at dinner (8, 6, 4 oz)

No fluid offering after the evening meals unless medically indicated to do so or requested

Carefully monitor fluid intake all day

Use overnight, appropriate incontinent products for incontinent residents

Encourage time to urinate before bedtime

Repositioning

New research has demonstrated there is no statistically significant difference between a 2 hour turning program and a 4 hour turning program with appropriate interventions:

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014. Pages 91-117 www.npuap.org

Activity:

Increase Daytime Active Engagement

Sleep better

Have less falls

Have less depression

Have less agitation

“Active Engagement: Pulls participants out of a passive state, expending energy, providing pleasure and movement opportunities, and reducing other neuropsychiatric symptoms.” (Buettner, Fitzsimmons & Dudley, 2010)

Aromatherapy

Certain studies involving brain wave frequency indicate that smelling lavender and chamomile increases alpha waves in the back of the head, which are associated with relaxation

Jasmine and citrus increases beta waves in the front of the head, which are associated with alertness

Eucalyptus can relieve sinus headaches due to its anti-inflammatory effect

Peppermint applied topically causes nerves to be less stimulated and pain relieved

Ginger applied topically relieves nausea.

Things you might see during our pilot.

Actigraphy

Hug Light

Night Lights

Light Meter

Data Logging Sound Meter

Mini Sound Meter

Sleep Cart

Eye Masks w/ ear plugs

Blanket Warmer

Recliners

Aromatherapy

Black Out Blinds F

Fireplace

Rope lighting

Hot Water Dispenser

Music

Sound Machines

Wireless headphones

TV Dimmers

“Start by doing what’s necessary, then do what’s possible; and suddenly you are doing the impossible.”

~ Francis of Assisi

Any Questions?