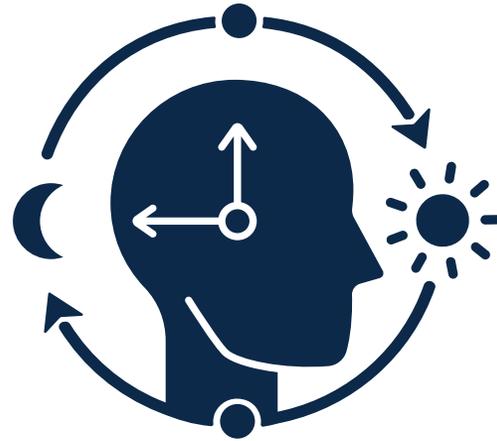


The Effects of
DAYLIGHT SAVING TIME
on **MENTAL HEALTH**

OCTOBER 2021

QUESTION



What are the Effects of Time Change on Mental Health?

PRESENTATION OVERVIEW



CURRENT STATE: Mental Health & Substance Use



THE SCIENCE behind the **effects of Daylight-Saving Time (DST)**



Changes to the body during time change



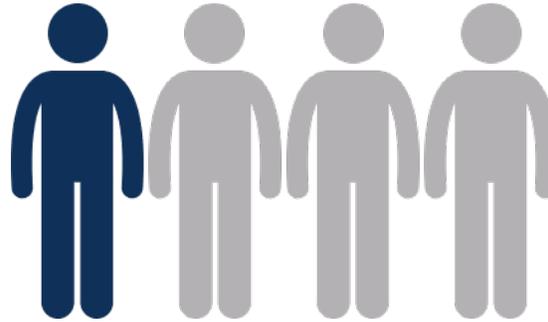
Mental Health and Substance Use as a result of time change

CURRENT STATE

CURRENT STATE



DST is the idea of aligning waking hours to daylight hours.



1 in 4 adults - will struggle with mental health or substance use in Oklahoma each year.



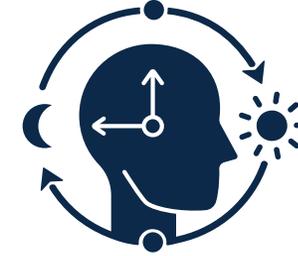
More people are dying by **suicide** each year than motor vehicle accidents, and more people are dying from **substance abuse** than by handguns.

THE SCIENCE



EXPOSURE TO SUNLIGHT

Most people's internal clock roughly follows the pattern of the sun.



CIRCADIAN RHYTHM

The circadian rhythm is the body's internal clock that carries out the business of the body.

JET LAG

Disruptions to the Circadian Clock



Daylight Saving Time is basically
society-enforced jetlag.

Symptoms related to jet lag include:

Insomnia | Daytime Sleepiness | Indigestion | Irritability | Poor Concentration

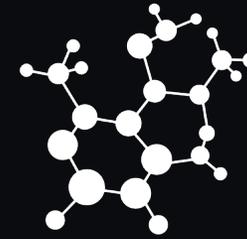
According to the Journal of Industrial Health, 2019



Melatonin Disruption

Time change affects the production and continued release of the sleep hormone melatonin.

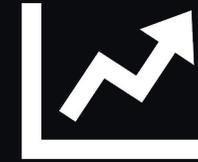
This disruption can cause increased risk of mental health issues.



Reduced Serotonin

The end of Daylight-Saving Time can lead to the drop of serotonin levels from less sun exposure. Serotonin is a key hormone that stabilizes our mood, feelings or well-being, and happiness.

According to Time Magazine, 2017



Cortisol Rises

The end of Daylight-Saving Time can lead to an increase of cortisol production. Each one-hour delay was associated with a 5% median rise in the stress hormone cortisol in the bloodstream.

According to Chronobiology Int. 2014



Adrenaline Increases

The end of Daylight-Saving Time can also lead to Increases in adrenaline. Adrenaline increases your heart rate, elevates your blood pressure, and boosts energy supplies.

According to Chronobiol Int. 2014



Pro-Inflammatory State

The end of Daylight-Saving Time can also lead to increases inflammation. The Increased inflammation serves as a risk factor for anxiety and depression.

According to Brain, Behavior, and Immunity Volume 87, July 2020,



Vitamin D Deficiency

The end of Daylight-Saving Time can also lead to insufficient or deficient Vitamin D levels, which is as essential for mental health as it is for physical health.

According to Brain, Behavior, and Immunity Volume 87, July 2020,

CHANGES TO YOUR BODY

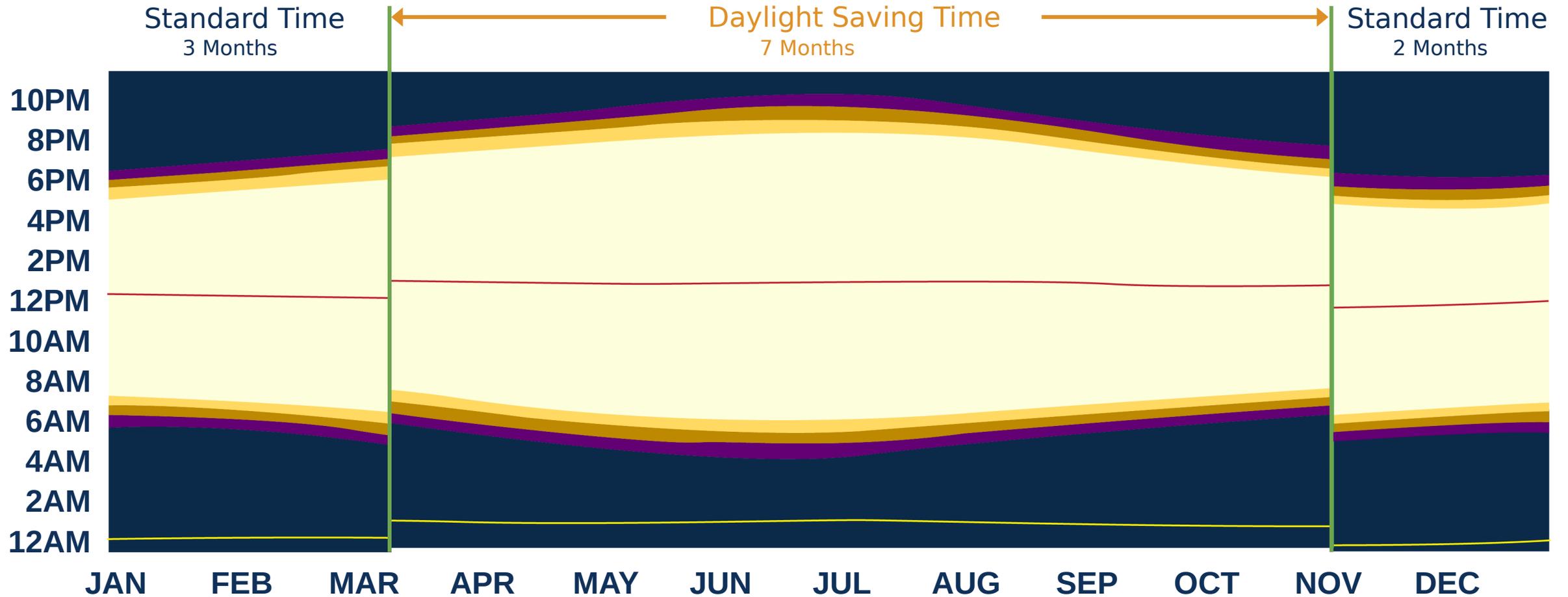
OVER EXPOSURE TO ARTIFICIAL LIGHT

Disruptions to the Circadian Clock



According to the International Journal of Environmental Research and Public Health, 2020

2021 Sun Graph for OKC



Source: timeanddate.com

EXPOSURE TO THE SUN



Less Sunlight

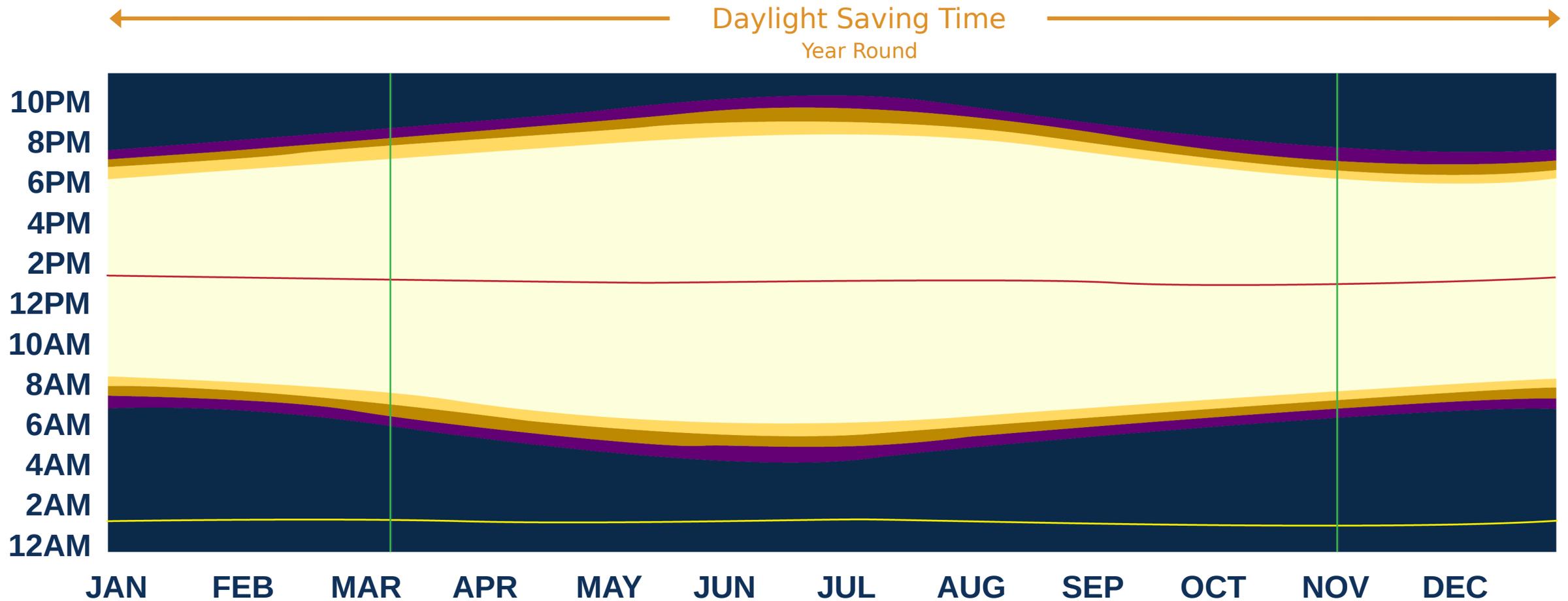
Decreased exposure to healthy natural daylight and increased exposure to artificial light sources can result in deficient vitamin D, melatonin and serotonin levels.

Low levels of vitamin D are linked to low mood, depression, fatigue, muscle pain and weekended bones.

This generates a newly emerging cognitive and emotional dysfunction syndrome similar to that found in severe substance abusers.

According to Issues in mental health nursing, 2011

2021 Sun Graph for OKC



Source: timeanddate.com

EXPOSURE TO THE SUN



What is known beyond doubt is that a sufficient amount of exposure to daylight is critically important to preserving good health and minimizing the risks of developing depression and other mood disorders.

According to the International Journal of Environmental Research and Public Health, 2020

More Sunlight

In general, because it gets dark later, people are more active and exposed to sunlight, which improves anxiety and depression.

More access to daylight with time change (**springing forward**) helps combat childhood obesity with more time for children to be active.

Childhood obesity results in a higher risk for depression, anxiety and substance use, and addictive disorders.

STANDARD TIME vs. DST

December 2020
Oklahoma City

Standard Time

If Daylight Saving
were still in effect

2020	Sunrise 	Sunset 	Sunrise 	Sunset 
Dec 1	7:21am	5:17pm	8:21am	6:17pm
Dec 2	7:22am	5:17pm	8:22am	6:17pm
Dec 3	7:23am	5:17pm	8:23am	6:17pm
Dec 4	7:23am	5:16pm	8:23am	6:16pm

Source: timeanddate.com

EFFECTS ON MENTAL HEALTH

SUBSTANCE USE & MENTAL ILLNESS

Disruptions to the Circadian Clock

A large body of studies have shown that circadian disruption increases the risk of substance use and addiction.

Low levels of Vitamin D can lead to depression and substance abuse.

SUICIDE RATES

Disruptions to the Circadian Clock



A 30-year study confirms that sleep disruptions during the spring transition to DST cause the risk of suicide to increase by as much as 6.25%.

Suicides in males are 3'x greater than in females.

Changes in circadian rhythms are being recognized as a primary aspect of bipolar disorder and suicide.

According to Sleep and Biological Rhythms, 2008

DEPRESSION & MENTAL ILLNESS

Disruptions to the Circadian Clock



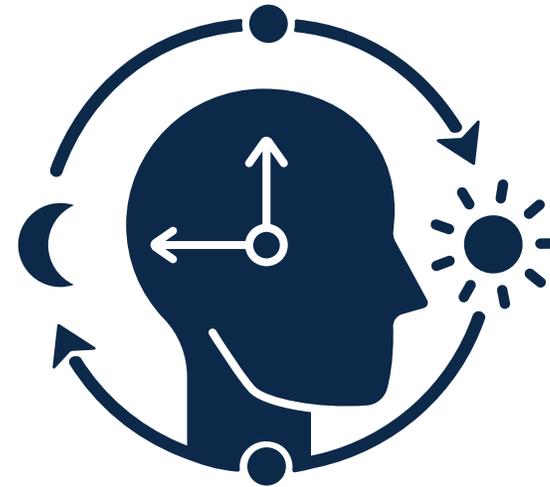
Sleep disruptions and less exposure to sunlight can cause an increased risk of mental health and substance use issues.

Time change can affect our mood – and signal the beginning of seasonal affective disorder (SAD), a type of depression that is associated with a lack of sunlight.

A 17-year Danish study found an 11% increase in depression cases after the time change in the autumn.

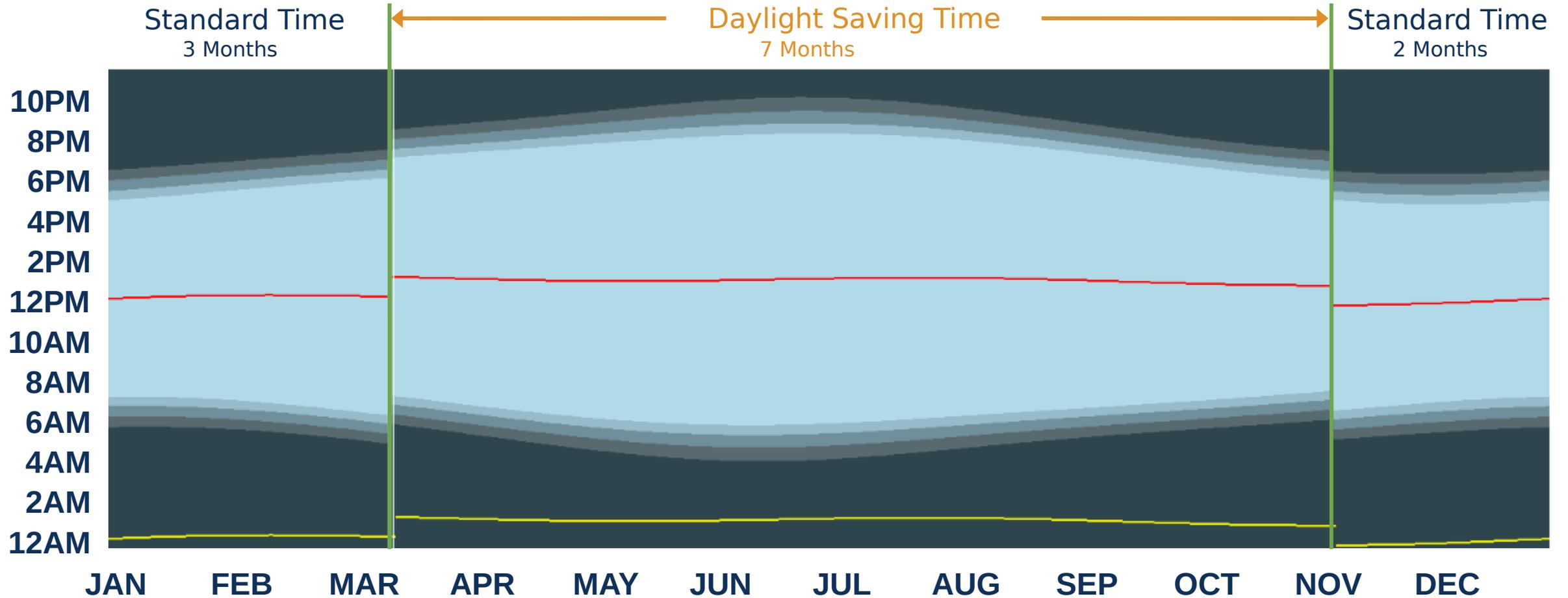
According to the International Journal of Environmental Research and Public Health, 2020

QUESTIONS



Susan Donnelly, ODMHSAS
Organizational Development & Effectiveness

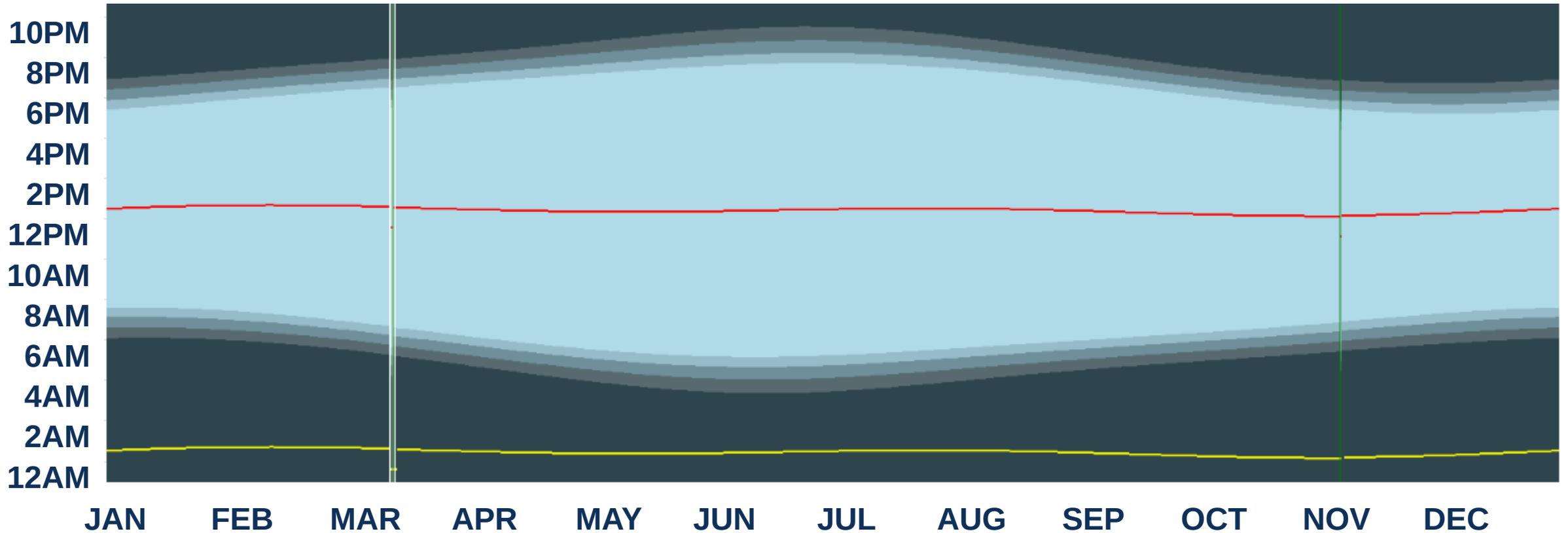
2021 Sun Graph for OKC



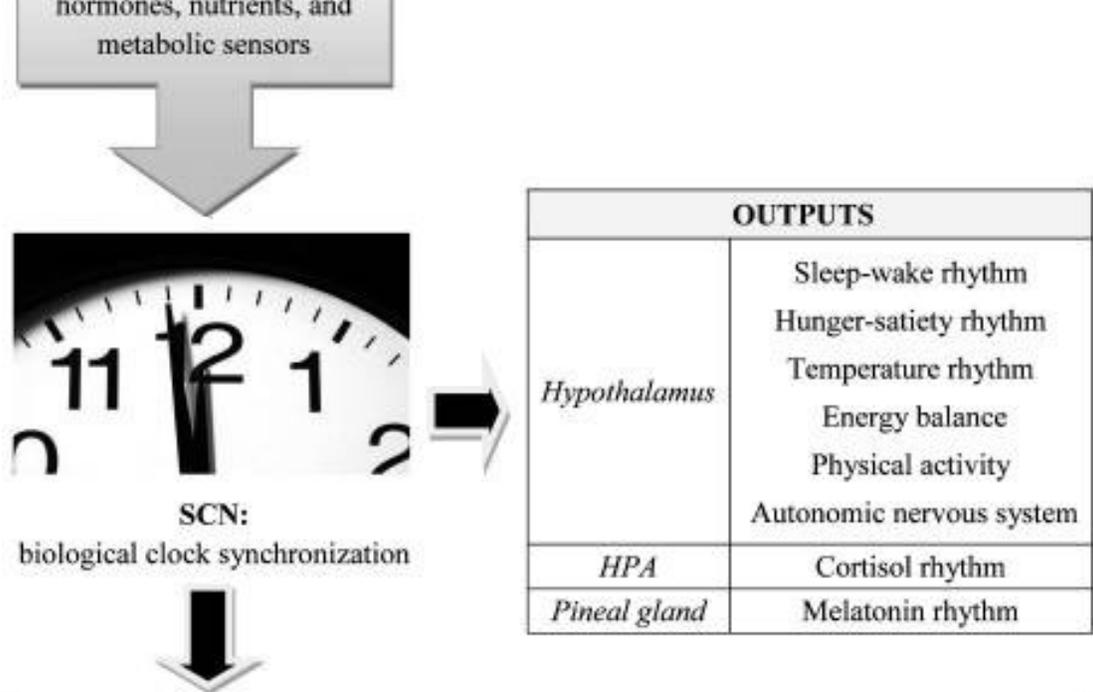
Source: timeanddate.com

2021 Sun Graph for OKC

← Daylight Saving Time Year Round →



Source: timeanddate.com



PERIPHERAL CLOCK GENES AND CLOCK-CONTROLLED GENES IN PERIPHERAL TISSUES		
<i>Organ</i>	<i>Light</i>	<i>Dark</i>
<i>Adipose tissue</i>	Adipogenesis, ↓ Leptin, nocturnin	Lipolysis, ↑ Leptin, nocturnin
<i>Pancreas</i>	Insulin secretion	Glucagon secretion
<i>Liver</i>	Glycosynthesis, synthesis of cholesterol and biliary acids	Glycolysis and gluconeogenesis
<i>Muscle</i>	Fatty acid consumption, glycolysis	Oxidative metabolism
<i>Stomach</i>	↑ Ghrelin	↓ Ghrelin
<i>Adrenal glands</i>	↑ Cortisol	↓ Cortisol