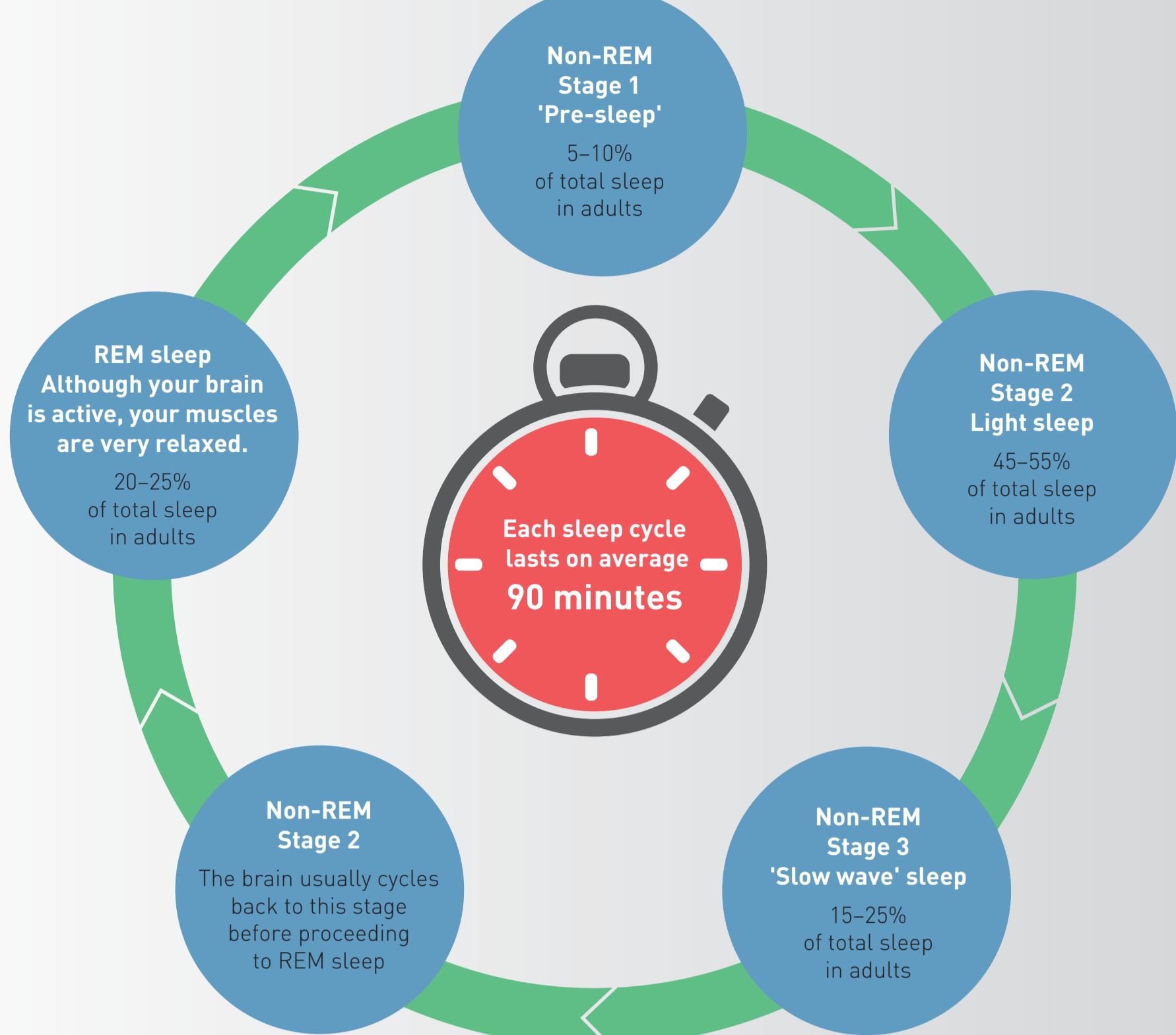




## Coffee and Sleep

### What does normal sleep look like?

Normal sleep is divided into non-rapid eye movement (NREM) and rapid eye movement (REM) sleep<sup>1</sup>. Adults typically need 7–9 hours' sleep per night, although this varies from person to person<sup>2</sup>.



### What do we currently know about coffee and sleep?

There is an association between the daily intake of caffeine, sleep quality and daytime sleepiness<sup>3,4</sup>.

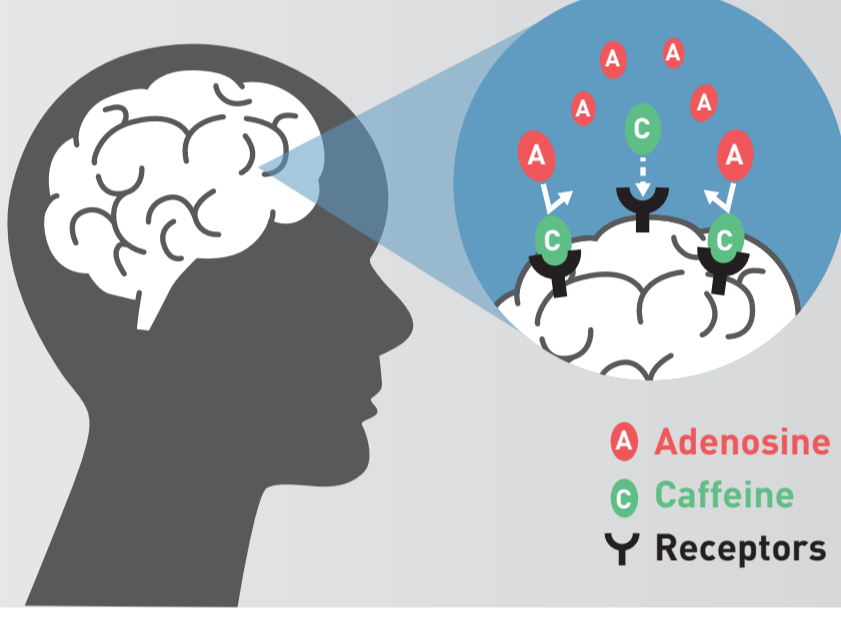
The effects of caffeine on sleep depend not only on the amount of caffeine ingested at bedtime, but also on the amount of caffeine ingested over the whole day, as well as individual susceptibilities and consumption habits.

Caffeine may have an impact on sleep for a number of reasons. Consumption of caffeine can prolong the time taken to fall asleep as well as reducing total sleep time and perceived sleep quality. Specifically, caffeine reduces slow wave, or deep sleep, and can increase wakefulness and arousals from sleep.



### How does caffeine affect sleep and alertness?

Adenosine is a molecule that has been linked to sleep. Caffeine and adenosine have similar structures, so caffeine can act as an imposter and block the actions of adenosine, replacing tiredness with feelings of alertness and arousal<sup>5</sup>. Caffeine's ability to make us more alert may also affect sleep quality in some people.



### Coffee and alertness

Caffeine may be effective at improving performance in people who work shifts<sup>6</sup>.



Caffeine may help those who are suffering from jet lag. For short stopovers of 1–2 days in a different time zone, sensible naps, combined with a moderate intake of caffeine, appear to be the most effective ways to maintain alertness and sleep<sup>7</sup>.

Drinking one large cup of coffee may be as effective as a 30-minute nap to reduce driving impairment without altering subsequent sleep<sup>8</sup>. However, drivers should always follow existing road safety guidelines.



### Why might coffee affect some people's sleep more than others?

A number of factors can affect an individual's response to caffeine consumption and subsequent impact on sleep.

#### Genetic sensitivity to caffeine

Several genes have been identified that affect an individual's sensitivity to caffeine.

The ADORA2A and ADA genotypes, as well as the DARPP-32 and PRIMA1 genes, have all been connected to caffeine's impact on a person's sleep quality. The same amount of caffeine can therefore affect two otherwise similar individuals differently, depending on their genetic make-up<sup>9</sup>.



#### Habitual consumption

Research suggests that the effects of caffeine are less marked in those who regularly drink coffee when compared to occasional coffee drinkers<sup>9</sup>.

#### Age

Only a few studies have evaluated the age-related effects of caffeine on sleep, and confounding factors are often present. Some research suggests that older adults may be more sensitive to the effects of caffeine<sup>4</sup>.



#### Time of consumption

Caffeine consumed closer to sleep time has the greatest potential for sleep disruption for caffeine-sensitive people, although there are only limited studies assessing the timing of caffeine consumption<sup>4</sup>.

Further information can be found on the **Coffee and Health website** [www.coffeandhealth.org](http://www.coffeandhealth.org)

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