

Calculating Sleep Efficiency

Formulas:

Sleep efficiency = **sleep duration** ÷ **bed duration**

Sleep duration = **bed duration** minus **awake duration**

Bed duration = time you get out of bed minus time you go to bed

Awake duration = time to get to sleep + times of all night time awakenings combined + time

Example:

Time to bed: 10 pm Time out of bed: 8 am

Bed duration = 8 am minus 10 pm = 10 hours

Awake duration:

1 hour 20 minutes to get to sleep.

1st night time awakening = 1 hr 2nd night time awakening = 1 hr

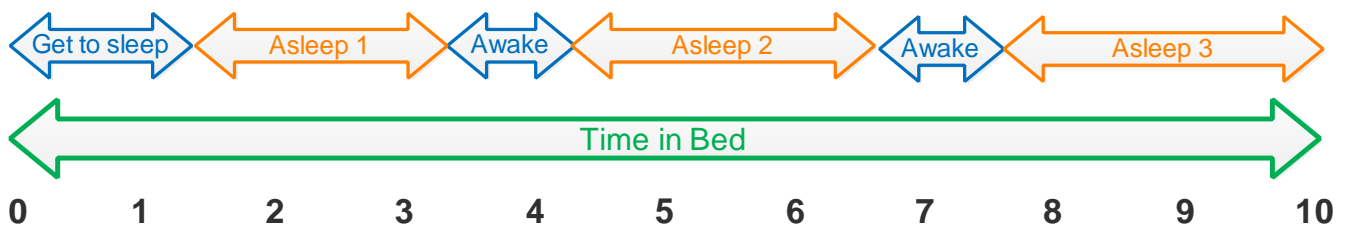
Awake duration = 1 hr 20 minutes + 1 hr + 1 hr = 3 hrs 20 minutes = 3.3 hrs

Sleep duration = **bed duration** minus **awake duration** = 10 hrs minus 3.3 hrs = 6.7 hrs

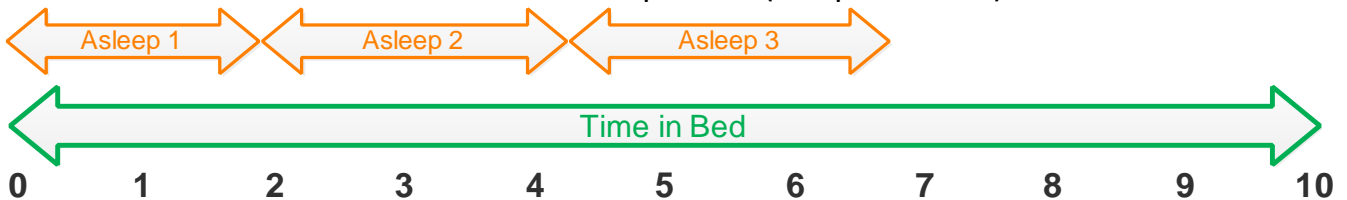
Sleep efficiency = **sleep duration** ÷ **bed duration** = 6.7 hrs ÷ 10 hrs = 0.67 = 67%

Shown as a diagram:

The sleep situation in the example:



Subtract the **Awake times** to leave the Sleep times (sleep duration)



Sleep efficiency = **time sleeping** ÷ **time in bed** = 6.7 hrs ÷ 10 hrs = 0.67 = 67%

Estimating Sleep Duration:

From above:

Sleep duration = **bed duration** minus **awake duration**

It is more practical to estimate the time we are awake than it is the time we are asleep.

During the night, each time you are awake, estimate the amount of time you were awake the previous awake time.

Example:

You go to bed at 10 pm.

You wake during the night. You estimate that it took you 1 hr 20 min to initially get to sleep. You write this down on a hand piece of paper.

You wake up again. You estimate that it you were awake for about 1 hour the previous time and write this down.

You wake up in the morning and get out of bed at 8 am. You estimate that your 2nd time awake was about 1 hour.

You add up the times awake: 1 hr 20 minutes + 1 hr + 1 hr = 3 hrs 20 min = 3.3 hrs

Averaging Sleep Efficiency:

You want to adjust your **bed duration** based on averages over 7 or more days.

Average efficiency = (total of all efficiencies) / # of nights

Example:

Sleep efficiencies over 7 days:

Day 1: 67% Day 2: 70% Day 3: 75% Day 4: 63%

Day 5: 69% Day 6: 72% Day 7: 70%

Total = 67% + 70 + 75 + 63 + 69 + 72 + 70 = 486%

Average = 486% ÷ 7 = 69%