

When stress levels become more than a person can handle, certain brain chemicals are affected, in particular:

- Serotonin
- Noradrenaline
- Dopamine

These are all chemical messengers that improve mood.

### **Serotonin**

Serotonin is responsible for making sure that your body's physiology is set for sleeping, by setting your body clock.

This involves the pineal gland and the cycle of conversion of serotonin to melatonin and back again, which takes 25 hours.

The pineal gland will, however, automatically set itself to a 24-hour day provided that the individual is exposed to a natural outdoor cycle (hence housebound folk may be affected).

This synchronisation of the pineal gland with Earth time takes about 3 weeks.

The body clock acts as the co-ordinator of the body, much like the conductor of an orchestra.

Three important players in the orchestra are: body temperature, the hormone cortisol (stress-fighting hormone) and sleep cycles. Each of these factors must be properly adjusted in order for sleep to be restorative.

The body temperature tends to drop just before we fall asleep. Cortisol also drops during the evening.

The sleep cycle between deep sleep and light, dream sleep, occurs about every 90 minutes. The cycle pauses for longer in the deep sleep (restorative phase) earlier in the night, whereas later, more time is spent dreaming.

Stress affects serotonin levels and thus interferes with sleep. One of the first signs of overstress is the inability to have restful sleep.

### **Noradrenaline:**

Noradrenaline is related to adrenaline, the 'fight, fright or flight' hormone. One of its main functions is in setting energy levels. Low levels of noradrenaline in the brain lead to feeling fatigued and lethargic.

### **Dopamine:**

Morphine is, as you will know, a potent pain relieving drug. It mimics natural substances in the body known as endorphins, which are responsible for our awareness of pain.

Dopamine is most concentrated in areas of the brain immediately adjacent to where the major endorphin-releasing mechanisms lie. When dopamine function declines, so does endorphin function. Stress-induced failure of dopamine function will thus reduce the efficacy of your body's natural 'painkiller'.

Dopamine is also involved in the 'pleasure centre'. A footballer scoring a goal will have a rush of dopamine, a dopamine 'high'.

When stress interferes with dopamine levels, the pleasure centre becomes inoperative and it is impossible to take pleasure in activities previously enjoyed.

With severe Dopamine/Endorphin malfunction, life becomes painful and devoid of any pleasure.