



## Is Sleep One of the Main Opportunities to Better Understand our Pathophysiology?

Diego Liberati\*

Department of Electronics, Information and Bioengineering, Italy

### Editorial

Sleep is one of our more urgent necessities: only breath is on average more urgent (but sometimes not even, as in narcolepsy!). And breathing has tight relationships with sleeping: physiologically, sleeping regularizes breathing, pushing the sympatho-vagal balancing more toward parasympathetic; pathologically, obstructive apneas make less easy to conciliate both functions at the same time. On the other hand, marine intelligent mammals, like dolphins, have learned to sleep half a brain at a time, in order to keep able to get on surface for breathing. Sleeping is in a sense a kind of breathing for the "soul", meaning at least relax for consciousness and an opportunity for psyche, as told in the psychoanalytical dreams interpretation. Drinking is maybe the only other physiologic function of comparable urgency, and we are physically mostly water! Eating, so cared in our culture, is probably physiologically less urgent, even if our habits bring us to eat several times a day.

Despite such capital role, even predominant in the early periods of human life, then apparently progressively decreasing, sleep has been very little and very late studied, maybe because, being mostly unconscious, it has been believed as out of control. Quite little is in fact known about sleep: we believe there is a certain amount of need, progressively decreasing with age, but one can at least temporarily shorten or even prolongate of a substantial amount the quantity of daily sleep as a function of the professional and social duties. Chronic sleep deprivation is surely incompatible with a proper life and in extreme cases even with life, but severe sleep apnea is for sure a kind of at least deep sleep deprivation. Some hormone secretion is often favorite at night and even synchronized with the 90 min dreams cycle. Sleep-wake daily cycle is surely related to the light according to the rotating earth period: it is known that in artificial settings the daily cycle is about an hour different from 24, that could probably also account for the fact that the typical delay in jet-lag recovery is more or less one hour a day. In our society, typically people tend to sleep once at night, but little children sleep almost all the day long, with several interruptions, needing to eat quite often: should not be that kind of rhythm more physiological also in adulthood? South European people for instance at least in summer take a nap in the early afternoon when it is quite worm and digestion competes for blood with brain, then working late in the evening. A genius like Leonardo da Vinci apparently slept a few minutes every few hours in a kind of so called polyphasic sleep most of his life, and so do in a sense elderly and sleep apnoic, besides children.

Nowadays lot of data are easily continuously acquirable in a noninvasive way from everybody even at home without really interfering with life and machine learning techniques easy to infer knowledge from big data sets: a campaign of more deeply studying in a multivariable dynamic way what happens during and around sleeping, and maybe even all the daylong taking into account the effect that the quality of sleep has on the wake, could be added to what is already know in order to better grasp such a fundamental function all over our life span, thus probably contributing to the quality, besides the quantity, of our life, in a kind of holistic approach overcoming the traditional specialization in the different branches of Medicine toward a really personalized and precision medicine.

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#### \*Correspondence:

Diego Liberati, Department of  
Electronics, Information and  
Bioengineering, National Research  
Council of Italy, 20133 Milano, Italy, Tel:  
(+39)3480569317;

E-mail: [diego.liberati@gmail.com](mailto:diego.liberati@gmail.com)

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