

# Reward actualities

## Reward from anthropological origins till nowadays<sup>1</sup>

### Reward basis

Reward system is a key to understand how we can be in health and live in wellbeing or wellness. It is the series of dopaminergic and serotonergic neurons that involve our body-mind unity. It starts in fact from VTA, ventral tegmental area in midbrain and then:

- There is a lateral reward pathway related to stress conduction messages
- Mainly there is a medial reward pathway related to life functions regulations, wellness, and also the more known decision making and learning and memory capacities.

All this is strictly of anthropological interest since it involves men and women as individuals, couples, families, and society about health and about all that is human, particularly life functions. Originally reward system was of neuroscientific/psychiatric field but nowadays more and more it is a branch of the springing lifestyle medicine and of integrated/integrative medicines too.

### The origins

It has been discovered by Olds and Milner in 1954. Actually i would say that it starts its beginning with the origin of thought. When we, as humans, had to decide whether something was bad or good, or if something was better and why, and finally which was the best choice for our descendents we had to base all this on our reward system. A good perception is to favor toward a worse one. This is fact. Perceptions are fundamental and always to follow, our instincts have to guide us as much as rationality. Symptoms too are to follow, to distinguish if something involving us from a medical point of view is good or not, is to undergo or to stop (a behavior, a drug/medicine, a choice). And, reward system is what we base on in order to make decisions, to understand reality. Then we have Pavlov discoveries: he understood that when we want to reinforce a behavior, making it automatically, we have to act on reward positively. Giving a dog a reward is a way to reinforce his taught behavior. We are more or less in the sixties of last century. Going on, reward is verified from neuroanatomical and imaging points of view.

### Actual scientists

Now, some scientists have become famous for their studies:

- Dreher, from France, said that reward is related to decision making and that the more we age the less we can take good decisions- another source discovery says that every decade we lose 10% of our dopamine reserve
- Fisher, a researcher who wrote some manuscripts in which “Why we love” relating reward to affective life and feelings
- Grigson Kennedy, studying reward and addiction. But i want to focus also on what now is new about reward system.

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## Reward, health, anti-reward<sup>2-8</sup>

At first we should relate reward to health. When we miss reward, lowering it artificially with an antagonist like antidopaminergics do, we see so many side effects that we can think we are in front of a toxic effect. If we consult official sources, also from drug companies,<sup>2</sup> we see for example that such medicines can:

- At first determine 15-20 years less of life span, in quantity<sup>3</sup>
- In quality, they reduce life functions
- Dyspnea - particularly after an effort
- Palpitations and arrhythmias - verifiable
- Disfagia - people have to eat soft diets or they risk ab ingestis pneumonias
- Dispepsia - difficulties to digest heavy or normal foods
- Constipation - always needing to take integrators or drugs to evaquate
- Menstrual and sexual dysfunctions - verified in lots of studies, from reduced libido until smaller inner local organs<sup>4,5</sup>
- Dysmetabolism – diabetes, obesity, metabolic syndrome are due to insulin resistance induced by these drugs<sup>6</sup>
- “Sleep addiction”, the increased and never satisfied need to sleep
- After long years of therapies, reduced bone density despite integration with oral vitamin D until osteoporosis and bone risks + photo sensibility, creating problems in sun bathing to get vitamin D<sup>7</sup>
- Even after 1-2 years of therapies and more with time, it is increased the risk of cancer as a 2007 4.000.000 people study demonstrated: 50% more of breast cancer and 308% more of colon cancer<sup>8</sup>
- 2-3 times more of sudden cardiac deaths and also difficulties in travelling and in daily life needs

- Finally 28% of pregnancies end with death of baby, 40% of diabetes for mothers, double risk of undergoing cesarean section, cases of malformations - even drug companies focus on the need to avoid all this in pregnancy and lactation.<sup>9-12</sup>
- such therapies are indicated for 12 weeks in young people,<sup>13</sup> and there are studies only until 3 years of therapies despite they are used as maintenance - moreover studies tell that after 1-2 years of remission they should be stopped.<sup>14</sup>

All this makes us understand indirectly how reward system is related a lot to health and wellness.

## Reward and health applications

### Dopamine, stress, resiliency

But why are these drugs still used? Since for the dopaminergic theory, 90% of psychiatric diseases could be due to an increase in dopamine. A part that if this were true, a study reminds us that psychosis is only the omission of rewards,<sup>15</sup> and we will see the techniques to solve and act reward with lifestyle. But this is however in practice false, since why is dopamine not low? Since stressful stimuli make it balanced. When we are living a stressful condition our CRH-ACTH-cortisol axis increases; but we could feel pain, we could feel stressed...until the impossibility to face the situation. Thanks to dopamine we are and become on the contrary able to live and overcome that situation. Dopamine is resiliency basis. A recent study from Vanderbilt University by Calipari and Gunes Kutlu is confirming that reward stressful stimuli can increase dopamine and that all related literature and therapies should be reconsidered.<sup>16</sup> Infact we should not eliminate the resilient part of the chain, but the stress or even better the stress cause!

### Reward and human rights

Another recent study infact underlines that only neuroscience can explain human rights: reward is the common element.<sup>17</sup> When we do what i can call a micro damage, existence damage, a moral damage, or a demonstrable damage like a side effect also persisting in time and becoming organic...we act negatively on reward system and we are against human rights.

### Reward and longevity<sup>18-20</sup>

#### What can we do to save reward?

Reward is our qi-jing-shen we could say, the three treasures for traditional Chinese medicine. Lots of studies are focusing on links between reward and longevity. The D2receptor, but also D4, are involved both in (anti)dopaminergic therapies and in longevity. Living beings with higher D2 have longer lives even until 40% more toward others. They have more mobility and motility; they have particularly more fertility and fecundity. They do have better lives. But, we cannot extend life artificially with supplementation, these studies say - not so are thinking the Silicon Valley start-up Alto Labs on which even Jeff Bezos is investing: they are creating some dopamine derived proteins with the potential of extending life of 40-50%.

### Balancing reward with lifestyle<sup>21</sup>

Naturally we can act on reward to balance it and to improve its functions:

- With lifestyle.
- A 2000kcal/day well balanced diet rich in 5 colors fruit/vegs - is a human right for everyone in this World.

- A 10.000 footsteps or 30 minutes/day physical activity is also a human right - of having a 9to5 job permitting us to have some energies to make fitness
- same time for meditation and mindfulness activities, to manage stress and to distress is a human right
- A pleasant satisfying affective life with our partner, with whom sharing feelings projects and dreams, a daily happy time with our children helping them in school activities or playing with them or doing outside hobbies, and also having the possibility of spending good time with true friends and relatives - all these are human rights
- An adequate 7-8 hours/day sleep hygiene, waking up refreshed and full of energies (not victims of sleep addiction like some drugs can make, eg).

### Salutogenesis<sup>22</sup>

Other ideas can help us. Salutogenesis is the Antonovsky theory according to which health is a balance, and disease is part of life but, we do can be better thanks to alternative medicines, lifestyle regulation as i told, and an integrative way of intending medicine. Integrated medicine is the branch unifying drugs and complementary medicines. Integrative medicine is the branch seeing human as a unique of body-mind. We should do this, since if we want to understand the relationships between organic dysfunctions and between side effects in order to regulate and reduce them, it is the only and best way.

### Cam and reward

So we should practice and recur to traditional Chinese medicine and ayurveda (the science of life). We should be aware of phototherapy. We should know art therapy, useful to express our deepest emotions. Or aromatherapy to feel better. We can benefit of light therapy, not for the 'seasonal mood dysfunction' but in order to improve our bones and skin and inner health. We could recur to positive psychology techniques instead of classical focusing-on-problems psychotherapy (activating always the same neural webs leading to impotence feelings): it able to increase our self-esteem and happiness. We should also practice empowerment and be part of the slowness movement: at work and at home we have to feel the protagonists of our life.

## Conclusive perspectives

### Reward as a human right

We should reconsider the initial idea according to which reward is basis for health and since health is a human right and, always from the fifties of last century, health is for WHO not only the absence of disease but also the fullness of our life in physical psychical and social terms, even reward, regulating as we saw health and wellness: reward is a need and a human right for everyone on this Planet.

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### Conflicts of interest

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