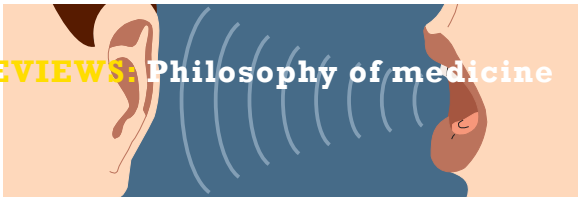

Intellect: If we don't use it do we lose it?

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Medicine it would seem, despite being a science, is no less subject to myths as any other walk in life. One myth we were taught was that the central nervous system (CNS) after initial development, changed very little. This may be far from the truth for it would seem that the CNS is subject to major modification according to the way we use our memory, attention and emotion throughout our lives.

The plasticity and adaptability of the CNS is exemplified by recent experiments examining the effects of stress on the animal brain.[1] By stressing an animal, it was found that certain chemicals such as tissue plasminogen activator were crucial in remodelling the brain's anatomy, particularly the amygdala which is associated with emotions and anxiety states. This 'rewiring' could be reversed if the animal was allowed to return to a normal environment. The discovery has significant implications for the development of anxiety and depression. This work has also been looked at from the point of view of stress, emotion and past experience in the development of Alzheimer disease.[2]

Stress has been shown to damage neurons in the hippocampus which is involved in memory. For some time, the negative effects of television watching on attention focussing and the stress response have been questioned as having a causal relationship in the development of cognitive decline in the elderly.[3]

Simple observation suggests to us that if we don't use some capacity then nature withdraws it. For example, not using our muscles leads to their atrophying or wasting away but using them builds them up. Not using our hands in manual labour leads to the skin being thinner whereas using them toughens the skin. Perhaps less obvious to us is the fact that our intellectual capacities need to be used or otherwise they can potentially waste away.

Leisure activities are extremely important. It has been shown that those who have less than average diversity in leisure activities, spend less time on them and practise more passive activities (principally watching television) were nearly four times as likely to develop dementia over 40 year follow up compared to those who rate higher than average on these parameters.[4] Protective were diverse leisure activities, activities which are more intellectually engaging (playing music or games, reading etc) or physical activity. This finding has been confirmed in similar studies.[5] Work too, if it is involved with working in a job one desires, is also protective as is high self esteem[6] but work in a job which creates little interest or intellectual engagement is associated with significantly increased risk. Physical exercise, even if moderate, also seems to be protective against cognitive decline and stimulate neuronal growth directly.[7]

Major psychiatric illness, on the other hand, is 3–4 times more common in people who had developed dementia.[8] The causal link is not exactly known but is probably mediated through the pathways mentioned above.

Interestingly, marriage is protective against dementia in all its forms, being over twice as common in the never married independent of other risk factors.[9] One can speculate as to why this may be. Is it the protection against mental illness, the need to engage in communication and shared leisure activities, or is it that it is so taxing upon our intellectual resources?

What can we take away from this brief review? At the very least, a thorough history of psychosocial factors is a part of the assessment of a person with dementia and psychosocial factors are a vital part of management (Table 1). The preventive implications of this research are the need for structuring work, leisure and social life in such a way that the risk of dementia is reduced. If current trends in work, leisure and social life are anything to go by, we could have a dementia epidemic far greater than we ever thought possible. The effects of inaction may well be felt for generations to come.

Table 1. Psychosocial factors affecting risk of dementia[10]

Risk factors	Protective factors
Major psychiatric illness (3-4 times risk)	Physical exercise
High stress	Diverse leisure activities
Television watching and passive leisure activities	Intellectually stimulating activities
Living alone, living with a dominant spouse and having no close social ties	Marriage and social contact
Unproductive working style	Stimulating work

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